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Strategic discrimination and the emergence of systematic exclusion

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Abstract
This paper studies how individuals consider other individuals' preferences when selecting whom to include in a group or network in the absence of any personal taste or statistical reason associated with the inclusion of a particular applicant. This type of decision emerges, for instance, when unprejudiced white landlords discriminate against black applicants because of the prejudice of existing white tenants, or when employers hire an employee-referred candidate instead of an outsider who is disfavored by current employees. We investigate the potential causes as to why selectors consider the group composition preferences of other group members. First, selectors have altruistic feelings toward them and select their preferred candidates. Second, selectors anticipate that their cooperativeness depends on who will be included and so strategically select candidates who are preferred by current group members. We investigate the reasons for this type of discrimination in an experiment in which we allow for endogenous group formation and show that discriminatory behavior in embedded contexts emerges even when selectors have no taste for any candidate nor any reason to discriminate statistically, but still discriminate in favor of a current group member's preferred candidate both for altruistic and strategic reasons. We thereby identify a new major source for discrimination and for the perpetuation of systematic exclusion of outsiders disfavored by insiders, even when the latter do not participate in the decision of whom to include. We discuss the implications for policies aimed at overcoming strategic discrimination in hiring decisions, employee referral programs, quotas, and bonus payments.

Keywords Discrimination · Social preferences · Social distance · Exclusion · Public good game

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Extended author information available on the last page of the article

1 Introduction

Individuals must often select whom to include in a group, and prejudiced individuals often discriminate against certain other individuals because of personal preferences (Becker 1957; Hodson and Dhont 2015) or beliefs regarding their productivity (Aigner and Cain 1977; Arrow 1973; Phelps 1972; Baumle and Fossett 2005; Pager and Karafin 2009; Levy 2021). While we know much about the causes and consequences of such decisions taken in isolation, less is known about how individuals select whom to include in a group depending on the preferences of those already in the group, which might lead to the systematic exclusion of applicants who are disfavored by those already in the group. For instance, when the owner of an apartment building must choose between different applicants to rent an apartment to, he or she not only establishes a new relationship with the chosen tenant but also alters the composition of the apartment building's community and, thereby, its social dynamics. This re-composition may lead to positive or negative outcomes on the relationship between the landlord and current tenants, given that the latter might either praise or blame the landlord for his or her selection decision. Landlords might take into account these behavioral responses and lean toward choosing candidates who are preferred by current residents. This could potentially result in the systematic exclusion of applicants from a group not favored by current tenants, even if the landlord has no taste for or statistical reason to favor one applicant over another.

In a corporate environment, the inclusion of a new employee in a team might influence its dynamics, the employees' willingness to cooperate in the team and their personal attitudes toward the hiring manager. The employees' reaction will depend on whether the manager aligns with the group's preferred composition when making hiring decisions. The inclusion of a single member can change an entire group or network structure, and managers without prejudice might have a reason to discriminate against individuals who are disfavored by their employees, leading to the systematic exclusion of certain individuals who, even if equally competent and not disfavored by the manager, will never be hired. The consideration of other group members' preferences by those responsible for inclusion decisions is a pressing social and political issue when group members' preferences stem from animosity and prejudice against minorities or result from (correct or wrong) statistical discrimination. An example of this involves situations in which landlords discriminate against black clients in response to prejudiced current and prospective white clients (Ondrich et al. 1999; Zhao et al. 2006; Neumark and Rich 2018).

We study why and to what extent individuals selecting new group members consider the group composition preferences of current group members and their behavioral responses in the event their preferences are or are not met by the decision of the individual responsible for selecting whom to include in the group. We investigate to what extent the decision to include someone preferred by current members is caused by the selector's altruistic preferences for current group members or by strategic motives arising from the prospect of greater cooperation between the members of the group if their preferred candidate is included, or between group members and the selector herself/himself if they select the person preferred by the members (a positive act toward them, and one that is likely to trigger positive reciprocity). Thus, we study to

what extent, and under which conditions individuals potentially discriminate—in the absence of any personal taste or statistical reason against any candidate—to satisfy other group members' preferences, thereby aiming to foster cooperation in the group to maximize their own profits. We denote this phenomenon *strategic discrimination*.[1]

In delving into this question, we study selection decisions in an endogenous group formation context, in which one group member (the selector) can choose whom to include in the group. The selector has, by design, no personal taste (Becker 1957) nor any statistical reason (Aigner and Cain 1977; Arrow 1973; Phelps 1972; Dickinson and Oaxaca 2009) to choose one of the two available candidates, while the other group members prefer a particular candidate. The earnings of all group members depend on their contributions to a group project—a public good (Holmström 1982). Eliciting selectors' reservation prices and their selection choices with the Becker–deGroot—Marschak mechanism (1964) allows us to identify if selectors consider the group composition preferences of current members when deciding whom to include. We assess to what extent the inclusion decision alters existing group members' willingness to contribute to the public good and their attitudes toward the selector, depending on whether the selector satisfies their preferences or not. To disentangle whether strategic or altruistic motives toward current group members explains the discrimination that arises in favor of the current group member's preferred candidate, we exogenously vary to what extent current group members are enforced to cooperate. To identify potential reciprocity effects, we study whether current group members display reciprocal behavior if selectors live up to their preferences by varying whether the new member is randomly selected by the computer or deliberately chosen by the selector.

Our results reveal that 60% of the selectors consider current members' group composition preferences in the absence of personal taste or statistical reason to select either candidate, leading to most candidates who are disfavored by current group members never being included in a group. This effect persists when the inclusion of a new member cannot bring any monetary gain (in the form of inducing higher cooperation in the group) for the selector but this is more pronounced if strategic incentives are present. The altruistic preferences of selectors and strategic considerations, therefore, both induce selectors to consider the group composition preferences of others. While the selection decisions of some selectors are driven by strategic incentives, altruism prevails for others.

[1] Taste-based discrimination models assume that individuals have preferences, i.e., a taste against individuals with a certain characteristic or of a certain group. Statistical discrimination, in contrast, is a rational response to uncertainty, and it occurs when an individual uses stereotypes or group averages as proxies for unobservable characteristics (such as productivity) to fill an information void, thereby treating otherwise identical members differently. In our setting, selectors have, by design, no taste against any candidate, nor do they have any reason to believe one candidate is more able, productive, or cooperative than another. The selector knows that a characteristic of one candidate, namely his or her popularity with current group members, is greater for one than the other. In this sense, his or her decision to include this candidate is based on this characteristic, and his or her decision is close to statistical discrimination. It is certainly not the type of characteristic stressed in the statistical discrimination models (ability or productivity), nor is it uncertain, as the selector knows it. The selector has a belief in how current group members will react if the selector includes the candidate with this characteristic, increasing their cooperativeness, but this is indirect and strategic, and not based on the characteristic of the included individual. This is why we use the term strategic discrimination instead of a sub-type of statistical discrimination.

The results have a diverse range of ethical implications. In some situations, it is desirable to consider group composition preferences from an ethical perspective: there are incentives, for instance, for selectors to include tolerant and non-prejudiced candidates in a team when current team members refuse to cooperate with prejudiced people. In this case considerations of group composition preferences reinforce the groups' good moral standards. In other situations, the social embeddedness of the decision of whom to include in the group leads to discrimination being reinforced because selectors who consider the preferences of prejudiced group members are likely to discriminate strategically.

Discrimination is here considered to be an unjust and prejudiced distinction in the treatment of people. This might be the result of unintentional or unconscious decisions: if decision-makers consider current group members' group composition preferences and recruit new members from their network, then minorities have fewer opportunities to advance socially. Those who are not favored by some members of the group, and who might have no say in the decision to include others, will be systematically excluded. On a broader level, the self-reproduction of (elite) groups may contribute to the perpetuation of discrimination against minorities; this is a societal issue which, besides unjust police violence against black citizens, led to the emergence of the "Black Lives Matter" movement.

The contributions of this paper are twofold: first, in relation to the economics of discrimination, it is one of the few studies investigating the behavioral channels that underlie discrimination in the absence of any taste-based or statistical reason. While individuals are usually embedded in social environments of interpersonal relations, taste-based and statistical discrimination models abstract from the above-described strategic incentives that arise from the preferences of others and study the discriminatory behavior of atomized actors who are not affected by social relations. However, individuals engage in a variety of discriminatory behaviors if they presume that colleagues or friends might gain utility from interacting in groups that include their preferred candidates, or if they anticipate greater cooperation, and therefore higher monetary rewards when they select the preferred candidates of current group members. Consequently, altruistic preferences and strategic considerations are likely to result in discrimination in groups being more widespread than in individual decision making (Daskalova 2018), and this does not necessarily diminish in competitive markets.

Second, this paper contributes to the question of whether organizations that struggle with systematic discrimination against minorities should use externally imposed selection procedures (such as quotas or the outsourcing of the recruitment process) to overcome homogeneity induced by endogenous group formation (e.g., Azmat 2019; Charness et al. 2011) or by gender stereotypes that depend on the task to be performed (Fischbacher et al. 2022). If the increase in the performance in homogeneous teams that include team members' preferred candidates could be, *inter alia,* explained by positive reciprocity triggered by favorable selection, then exogenously imposed selection criteria (such as quotas) might mitigate any decline in productivity that is driven by negative reciprocity; prejudiced team members will no longer punish selectors for actively selecting a minority candidate. If the decision to include the group members' preferred candidate is caused by the selector's altruism toward current group members,

or by strategic motives, then a limitation of the selector's choices based on external selection criteria can mitigate this type of discrimination and the systematic exclusion of certain candidates that arises because of it.

Finally, this paper offers an additional explanation as to why employee referral programs do not only enhance the efficiency and quality of the employer–employee matching process (Cappellari and Tatsiramos 2015; Ioannides and Loury 2004; Topa 2011), but may also boost the motivation of both the hired employee and the referrer. The referrer may reciprocate because his or her preferences have been considered by increasing the effort level in the group. The hired employee may reciprocate positively to the referral by the referrer and, as a result, contribute more to the referrer's group. Again, this has the negative consequence of preventing candidates who are disfavored by referrers from ever being hired and included, and this should be considered before a firm adopts such an employee referral program.

The remainder of this paper is organized as follows. The formal framework of our endogenous group formation model and its application to the public good game is presented in the Appendix. The next section presents the experimental design and how our hypotheses were tested in an experimental context. Section 3 presents the empirical results and a discussion of our findings, and the last section offers our conclusion.

2 Experimental setting

To study the impact of the group composition preferences of current members on Selector *A*'s selection decision, we designed an experiment comprising of four treatments, as illustrated in Fig. 1. In all treatments, players play a game that consists of

	Altruistic Selection	Strategic Selection		Random Selection
		Transparent	Opaque	
Selection decision by	Player A	Player A	Player A	*Random*
Selection decision is	Transparent	Transparent	*Opaque*	Transparent
Contribution of A	Forced	Forced	Forced	Forced
Contribution of B	Forced	*Free*	*Free*	*Free*
Contribution of C/D	Forced	Forced	Forced	Forced
Measured decisions	*A*'s selection choice and reservation price	*A*'s selection choice and reservation price *B*'s contribution if C or D is selected	*A*'s selection choice and reservation price *B*'s contribution if C or D is selected	*B*'s contribution if C or D is selected

Fig. 1 Experimental treatments

two stages: the selection stage and the contribution stage. In the selection stage, one additional team member must be selected from two candidates (*C* or *D*) to join a team consisting of two participants (*A* and *B*) and where only one, *A*, can choose whom to include. The excluded participant receives no payoff. By design, team member *B* prefers candidate *C*, who is a friend of *B*, while selector *A* has no preference for either candidate.

We employ an indirect method to induce *B*'s preferences for *C* or *D* while ensuring that *A* is indifferent to *C* and *D*. *A* must decide whom to include—a friend of *B* or a person neither *A* nor *B* knows.*B* probably has a preference to include their friend *C*, while *A* has no preferences for either of the two candidates. Half of the subjects brought a friend to the lab. They received an invitation to participate and were asked to bring a friend with them, who also participated. These subjects were randomly allocated to the role of *B* or *C,* while the other half of the subjects were not asked to bring a friend to the lab and were randomly allocated to the role of *A* or *D*. Subjects were unaware of the content of the experiment before it started. Similar procedures have been used in literature to study the impact of social distance on social preferences (Binzel and Fehr 2013; Brañas-Garza et al. 2010; Candelo et al. 2019; Goeree et al. 2010; Leider et al. 2009).

After the selection stage, all team members play a reduced version of a linear public good game (see Zelmer 2003, for an overview) from which they monetarily benefit. We assess the impact of *B*'s preference for *C* on *A*'s decision on whom to include in the group, thereby investigating how *D* can be systematically discriminated against and excluded by *A* even when *A* has no taste nor statistical reason to do so. We also examine the effect of *A*'s decision on *B*'s contribution to the public good, thereby also investigating how *B* reciprocates *A*'s decision. The main variables of interest are *A's* selection choice, their reservation price (willingness to pay) for making a selection decision, their beliefs concerning the subsequent contributions of *B,* and *B*'s contribution to the public good, which is contingent on who has been selected.

In *altruistic selection* (AS) treatment*, A* can select *C* or *D* for inclusion in the group in exchange for a price. All players (including *B*) are forced to cooperate in the subsequent public good game. If *A* is unwilling to pay to select the third team member, then the computer randomly selects one of the two candidates (*C* or *D*) for inclusion in the team. Team member *B* is told whether *A* or the computer has selected the new team member, and who the new member is. No team members make any decisions in the subsequent game, and the total amount of money in the public good is equally divided among all members of the team. All subjects know this before making any decision.

In *strategic selection* (SS) treatment*, A* can again select *C* or *D* to include in the group in exchange for a price. If *A* is not willing to pay to select the third team member, then the computer randomly selects one of the two candidates (*C* or *D*) to include in the team. *A* and the included member (*C* or *D*) are forced to cooperate in the public good game, but unlike in the AS treatment *B* can choose how much to contribute to the public good. In the *transparent strategic selection* condition, all team members are informed whether *A* or the computer has selected the additional team member, and who the new member is. In the *opaque strategic selection* condition, neither *B*, *C*,

nor *D* receive any information about whether *A* or the computer has selected the third team member.

In *random selection* (RS) treatment, *C* or *D* is randomly chosen by the computer. *A* and *C* are forced to cooperate in the public good game, but*B* can choose how much to contribute to the public good. All team members are informed that the computer has selected the additional team member, and who the new member is.

After forming the team, the three group members play a modified version of a public good game. In a standard public good game, participants must decide how to use their initial donations. The task of each player is to decide how many Taler to contribute to a team project and how many they want to keep. In our experiment, *A* and the new group member are, by design, forced to cooperate and the total amount of their endowments is automatically directed to the public good. In contrast, in the SS and RS treatments *B* can freely decide how much to contribute to the team project. *B* must decide how many of 100 Taler they want to contribute and how many they want to keep. In all treatments, each group member's income comprises the amount they keep for themselves and their share of the team project. While strictly dominant strategy in the game is to keep all the endowment for oneself, contributing all the endowment maximizes social welfare. All team members' contributions to the team project are multiplied by two and then evenly divided. Each group member's income from the project is calculated similarly, even though *A* and *C*'s entire donation is directed to the public good.

To what extent do altruism and strategic considerations drive the selectors' decision of whom to include in the group? We investigate to what extent consideration of the other person's (namely, *B*'s) preferences in an endogenous group formation process is driven by altruism or by the strategic considerations of the selector (*A*).

First, we study whether selectors, even in the absence of any strategic advantage, and hence of any potential monetary benefit, gain utility from satisfying the preferences of other group members for one applicant over the other. If so, then we can establish a causal effect between altruistic preferences for other group members and the decision of whom to include in the group. We assess *A*'s selection decisions in the AS treatment, where strategic considerations are absent by design because *B* remains passive, and *A*'s selection decision has no monetary consequence.

Hypothesis 1 Selectors will be willing to pay positive amounts to include *C* in the altruistic selection treatment.

Second, we investigate whether selectors consider *B*'s preference for *C* for strategic monetary reasons. Including *B*'s preferred candidate (*C*) may induce higher levels of cooperation between group members, and since *A* profits from this cooperation in the public good game, *A* has a material reason to pay a price to include *C*. We test the strategic incentive effect by exogenously varying the decision environment. In the SS treatment, material incentives are potentially present, while in the AS treatment, strategic incentives are absent by design. In both treatments, altruistic reasons to include *C* are equally present.

Hypothesis 2 Selectors will be willing to pay higher positive amounts to include *C* in the strategic selection treatment than in the altruistic selection treatment.

We designed the SS treatments in such a way that they are very similar and differ only to the extent that *B* receives information as to whether it was *A* or the computer that was responsible for the selection decision. The aim is to disentangle to what extent *A* is more likely to select *C* because *A* anticipates that *B* will cooperate more in a group with *C* because *B* will then interact with his or her preferred candidate, or because *A* anticipates that *B* will cooperate more in a group with *C* since *B* wants to reciprocate positively toward *A*. Both are reasons for *A* to discriminate strategically with the aim of increasing their monetary earnings. They differ only with respect to the mechanism underlying it: anticipating greater cooperation from *B* when interacting with *C,* or anticipating greater cooperation from *B* in terms of reciprocating positively toward *A*, who acted in a potentially positive manner toward *B*.

If *A* anticipates not only greater cooperation in a group in which *B* interacts with his or her friend (something that happens equally in the *transparent* and *opaque* conditions), but also that *B* will reciprocate positively in regard to *A*'s willingness to pay to select *C* (more pronounced in *transparent*), then *A* will pay a higher reservation price in the transparent treatment than in the opaque treatment.

Hypothesis 2.1 Selectors will be willing to pay higher positive amounts to include *C* in the transparent SS treatment than in the opaque SS treatment.

Lastly, we study the behavior of *B* as to whether *B* reciprocates positively toward *A* if *A,* in fact, selects *C*. Comparing whether *B* contributes more if *C* is randomly selected by the computer or is deliberately chosen by *A* reveals whether *B* reciprocates when decisions are favorable.

Hypothesis 3 *B* will contribute more to the public good if *A* includes *C* in the strategic selection treatment than when *C* is exogenously included in random selection treatment.

Each subject is assigned to three distinct treatments that they each play only once: the AS, the RS, and either the transparent or opaque SS treatment. The order of the treatments was randomized to minimize order effects. The design allows us to identify effects at an individual level, classify the participants, and study heterogenous treatment effects. Therefore, Participant *A* and *B* play in three treatments, but *A* makes only two selection decisions (because *A* does not make a selection decision in the RS treatment), and *B* makes only two contribution decisions in each session (because *B* makes no decision in the public good game in the AS treatment). Participants keep their role *(A, B, C* or*D*) over the entire course of the experiment. We apply random stranger matching in all our treatments –with the exception that *B* and *C* are always in the same group. Subjects were not told the content of the subsequent treatments and received instructions for each part of the session separately, and only when they reached that part. Subject *A* did not receive feedback at the end of each part, and so did not know the response of *B* in each part until the end of the experiment. Only one treatment was randomly selected for payment at the end of the experiment, and participants were aware of this from the beginning. To ensure that participants understood the instructions well, we asked control questions which needed to be answered correctly to be able to continue.

The experiment was run in November 2019 in the Cologne Laboratory for Experimental Research, in Cologne, Germany, and included 12 sessions. It was programmed in oTree (Chen et al. 2016). Subjects were recruited using the ORSEE software (Greiner 2015) and received a show-up fee of €4. All subjects play for the experimental currency unit, the Taler, which equaled €0.05.

In the selection stage, *A* selects a particular candidate if the utility gained from selecting this candidate is larger than its costs. To measure to what extent *A* considers *B*'s group composition preferences in the AS and SS treatments, we pin down this threshold value. To elicit a proxy for this reference price, we implement a multiple price list that closely resembles the Becker-DeGroot-Marschak mechanism (Becker et al. 1964). We ask *A* to decide between two options: if Option 1 is chosen, *A* can select a team member in exchange for a determined fee. If Option 2 is chosen, the computer randomly selects a candidate. *A* must choose ten times between leaving the selection to the computer or paying a potential fee of 1, 5, 10, 15, 20, 25, 30, 35, 40, or 45 and then acquiring the opportunity to actively select one candidate. The computer then randomly selects one of the ten possible fees and exercises the option chosen by *A* for that fee.

To assess if *B* conditions their cooperation behavior on whether their favored candidate is chosen or not, we apply the strategy method (Selten 1967) and let *B* state to what extent they want to contribute to the public good contingent on whether *C* or *D* is selected.[2] To test whether the changes in *A*'s selection decisions are based on anticipated changes in *B*'s behavior contingent on the selection procedure and its outcome, we elicit *A*'s beliefs regarding *B*'s contribution to the public good in an incentivized manner (*A* receives 25 additional Taler when their actual guess is no more than 3 Taler away from the actual situation). We elicit those beliefs in the RS and opaque SS treatments by asking about *B*'s average contribution decision to the public good, contingent on whether *A* or *B* has been chosen. In the transparent SS treatment, we ask *A* to answer the same question for four different scenarios: if *A* chose *C* or *D,* and if the computer chose *C* or *D*.

At the end of the experiment, subjects were asked to fill in a questionnaire on their personal data and a few control questions. We also generated survey data to measure altruism, reciprocity, and social preferences based on the questions included in the Global Preference Survey introduced by Falk et al. (2018). We also elicited the social value orientation of participants using a slider measure, as introduced by Murphy et al. (2011).

In total, 264 subjects took part in our experiment, with 66 participants in each of the *A*, *B*, *C*, and *D* roles, which resulted in 132 observations of selectors' (*A*) reservation prices and selection decisions, and 264 observations on current group members' (*B*) contribution decisions. The average age was 26 years. Slightly more females (59%) than males participated.[3]

[2] Since computations of final payoffs are considered complicated, we equipped participants with a slider tool to calculate the final payoffs of all participants contingent on B's contribution. Our data revealed that most participants made use of the slider tool.

[3] The experimental instructions presented to the subjects in the lab can be found in the online Appendix, including the German version and the translation into English.

3 Results

The aim of the experiment was to study selectors' (*A*s') motives for systematically paying to select *B*'s preferred member *C* in the absence of any taste-based or statistical reasons as to why *A* should discriminate against *D*. Its empirical assessment requires, first, that *B* has a taste for interacting with his or her friend (*C*) and second, that *A* anticipates and considers*B*'s group composition preferences. We first analyze these preconditions, therefore, before presenting the tests of our hypotheses.

First, when *B* is matched with his or her friend (*C*) across all three treatments in which *B* could decide how much to contribute to the team project, *B* contributed on average around 50 Taler more (from an endowment of 100 Taler) when playing the public good game with a friend (84 Taler) than when playing it with a stranger (34 Taler) (MWU test, two-sided, $p < 0.001$). In fact, only 6 out of 132 *B*s (4.5%) contribute nothing to the public good when playing with a friend, while 61 out of 132 *Bs* (46.21%) contribute nothing to the public good—and hence acted completely selfishly—when playing with a stranger. We therefore conclude that *B* has, as expected, a strong preference for including their friend *C* in the group.

In Table 1 we report B's average contribution to the public good by treatment, depending on whether their friend *C* or a stranger *D* was included in the group. *B*s contributed substantially more when a friend was included than when a stranger was included in all the treatments. Therefore, our treatment manipulation worked as intended.

Table 1 Contributions and selection decisions by treatment

	Altruistic selection (AS)	Strategic selection (SS)			Random selection (RS)	All treatments
		Transparent	Opaque	Total		
B's contribution if *D* (stranger) was selected	–	29.83 (6.18)	35.97 (6.98)	32.37 (4.61)	35.76 (4.87)	34.1 (3.35)
B's contribution if *C* (friend) was selected	–	83.88 (5.31)	82.67 (5.17)	83.03 (3.70)	84.61 (3.60)	83.81 (2.57)
Mean *A*'s reservation price	7.00 (1.40)	10.67 (2.20)	11.10 (1.99)	10.86 (1.49)	–	8.93 (1.03)
Proportion of *A*s with reservation price > 0	50% (0.06)	67% (0.08)	73% (0.08)	70% (0.06)	–	60% (0.04)
Proportion of *A*s who selected *C*	73% (0.08)	91% (0.06)	86% (0.08)	89% (0.05)	–	82% (0.04)
Observations	66	36	30	66	66	132

Standard errors of means in parentheses

Second, regarding the latter prerequisite (*A* considers *B*'s group composition preferences), we find that for all treatments selectors (*A*s) were willing to pay to select a candidate in about 60% (79 out of 132) of all cases. If *B* could deliberately vary their contributions (SS treatments), then such proportion increased to 70% (46 out of 66 *A*s). Conversely, it dropped to 50% (33 out of 66 *A*s) when *B*s could not choose how much to contribute (AS treatment). Overall, 82% of the *A*s who were willing to pay a price to acquire the right to choose whom to include in the group selected candidate *C* over *D,* and so discriminated on the basis of social relations. The lowest proportion of *A*s selecting *C* over *D* is observed in treatment AS, where 27% of the *A*s who were willing to pay to make a decision selected *D*. In this treatment, including *C* or *D* could not affect the earnings of *A* in the subsequent public good game. While this proportion is still much smaller than the 73% selecting *C*, it is still high, and the experiment does not identify the reason for this fact. *A*s might have been jealous that *B* could bring a friend to the lab, and therefore are unwilling to select the friend but rather a stranger, thus putting all subjects in the group in an equal position. Or perhaps *A* chose to include a stranger instead of a friend of *C* to have a more plural group.

The mean reservation price paid by *A* to acquire the right to select whom to include in the group equaled 8.93 Taler across all treatments. Even in the AS treatment, *As* had an average reservation price of 7 Taler, and so had a considerable interest in actively selecting a candidate in both the presence and absence of strategic considerations. There is evidence that subjects in the role of *A* considered the group composition preferences of the *Bs*.

3.1 The impact of altruism on selection decisions

We investigate our first hypothesis and whether selectors will be willing to pay positive amounts to include *C* in the absence of any monetary consequence, i.e., in the treatment in which, by design, no strategic incentive to select either candidate was present (*B*'s contribution is fixed). In the AS treatment, 50% of all *A*s stated a reservation price above 0. The average reservation price equaled 7 Taler (*t* test, H0: reservation price $= 0, p < 0.001$). Most *A*s (73%) who had a reservation price exceeding 0 selected *C* in the AS treatment (proportion test, H0 $= 50\%$, $p = 0.009$). These two results imply that a large proportion of individuals cared about their current group members' utility when embedded in social groups. They were willing to pay for the opportunity to select, and also selected the candidate preferred by current team members.

Result 1 Selectors consider current members' group composition preferences because of altruism toward current members, and systematically pay positive amounts to include a friend of an existing group member.

Moreover, the subset of *A*s who selected *Bs'* friend *C* had a mean reservation price of 15.2 Taler. On the other hand, the mean reservation price of *A*s who selected *D* was 10.78 Taler. This indicates that selectors who were willing to support the preferences of other team members value the option of making a selection decision more, although not significantly so (Mann–Whitney test, two-sided, $p = 0.56$). Lastly, we investigate whether *A*s might perceive a strategic motive to satisfy the preferences of *B*s in the

first parts of the experiment. Some *A*s might have assumed that they would, or could, interact with the same player later in future parts of the experiment. This could provide an additional reason for *A*'s behavior that is not solely driven by altruism. However, we find no evidence for such an effect (*id.*, mean reservation price in parts 1 and 2 vs mean reservation price in part 3, $N = 44$ vs $N = 22$, $p = 0.766$).

3.2 The impact of strategic considerations on selection decisions

We investigate our second hypothesis and test whether selectors will be willing to pay higher positive amounts to include *C* in the strategic selection treatment than in the altruistic selection treatment. The motivation for *A* being willing to pay *more* for the opportunity to select in the SS treatment (when *B* is not forced to cooperate) when compared to the AS treatment (when *B* is forced to cooperate) is only strategic, and given by the potential higher monetary earnings in the public good game.

First, the reservation price was 66% higher in the SS treatment (10.86 Taler) than in the AS treatment (7 Taler) (Mann–Whitney test, two-sided, $p = 0.0162$), and this price did not change between the transparency (11.1) and the opaque (10.67) conditions (*id.*, $p = 0.55$). About 70% of *A*s had a reservation price above 0 in the SS treatments, which is significantly more than the 50% observed in the AS treatment (Fisher's exact test, two-sided, $p = 0.033$); this did not change at all between the transparency and opaque conditions. Second, while 73% of the *A*s who were willing to pay to make a selection chose *C* in the AS treatment, 89% did so in the SS treatment (*id.*, $p = 0.077$).

Result 2 Selectors discriminate strategically. First, their reservation prices are 66% higher in the presence of strategic incentives than in their absence. Second, they are more likely to choose C in the presence of strategic incentives than in their absence.

To corroborate our finding, we further investigate if the observed treatment effect, and the higher price paid by *A*s in the presence of strategic incentives is driven by *A*s' beliefs about *B*s' contribution decision. We find that *A*s believe that *B*s contribute on average 80.6 Taler in the SS treatment if *C* is included, but only 29.7 Taler if *D* is included. This difference in the expected contributions is significant (Mann–Whitney test, two-sided, $p < 0.001$). Second, *B*s contributed 83.81 Taler, on average, some 145% more to the public good if they were matched with their friends (*id*., $p < 0.001$).

To assess if *As*' beliefs explain the consideration of *Bs*' group composition preferences, we calculated two ordinary least square regressions, and two Tobit regressions, presented in Table 2, in which we regress *A*s' reservation price on *A*s' beliefs conditional on the implemented selection. Throughout the specifications, we find—as we had predicted—that *As*' willingness to pay increases with *As'* beliefs with regard to *B*s' contribution if *C* is selected. Conversely, *As*' reservation price decreases with *As'* beliefs about *B*s' contribution if *D*, i.e., the stranger, is chosen. Only the latter effect is significant throughout all specifications. These results provide a further explanation as to why Hypothesis 2 is supported.

The ordinary least squares regressions presented in Table 3 confirm our previous findings that the reservation price in the AS baseline treatment (the models' intercept) is significantly different from 0. Furthermore, the effect of strategic incentives (*B*s could

Table 2 The influence of beliefs on *A*s' reservation prices in the strategic selection treatment

Dependent variable: reservation price	Model 1: linear regression	Model 2: linear regression	Model 3: tobit regression	Model 4: tobit regression
Belief friend	0.100 (0.065)	0.080 (0.063)	0.14 (0.093)	0.115 (0.089)
Belief stranger	− 0.111** (0.050)	− 0.117** (0.052)	− 0.141* (0.073)	− 0.151** (0.073)
Constant	6.142 (4.72)	9.80 (6.59)	0.587 (7.38)	12.91 (11.31)
Control variables	No	Yes	No	Yes
N	66	66	66	66
Left-censored obs.	–	–	20	20
Uncensored obs.	–	–	46	46

*$p \leq 0.10$, **$p \leq 0.05$; robust standard errors in parenthesis; to elicit "Beliefs Friend" we asked: "How many Taler did the average Participant *B* invest if the chosen participant was his/ her friend (Participant *C*)?"; to elicit "Beliefs Stranger" we asked: "How many Taler did the average Participant *B* invest if the chosen participant was unknown to him/her (Participant *D*)?"

Table 3 The impact of social preferences and strategic incentives on *A*'s reservation price

Dependent variable: reservation price	Model 1: linear regression	Model 2: linear regression
Treatment SS	3.864*** (1.344)	3.864*** (1.365)
Altruism 1		− 0.007 (0.010)
Altruism 2		0.964** (0.463)
Age		− 0.174 (0.107)
Female		− 4.037 (2.619)
Constant	7.000*** (1.405)	8.791*** (3.525)
N	132	132

Standard errors clustered at the individual level; "Altruism 1" is a survey item asking: "Imagine the following situation: you won 1,000 Euro in a lottery. Considering your current situation, how much would you donate to charity?"; To elicit "Altruism 2" we asked: "How do you assess your willingness to share with others without expecting anything in return when it comes to charity? Please use a scale from 0 to 10, where 0 means you are "completely unwilling to share" and 10 means "completely willing to share"

decide on their contribution) on *A*s' average reservation price in all specifications is significant, thus providing evidence for Hypothesis 2. Model 2 also reveals that *A*s who have more pronounced altruistic preferences had, according to the significant and positive coefficient of the variable, Altruism 2, a greater willingness to pay in order to be able to make a selection decision (in line with the *B*s' group composition preferences).

To analyze our additional Hypothesis 2.1, we investigate if *A* anticipates that *B* positively or negatively reciprocates, contingent on whether *A* supports *B*'s group composition preferences. Considering only those *A*s who chose *C*, they believe that *B*s contribute on average 89 Taler in the transparent SS treatment while *A*s believe that Bs contribute 79 Taler in the opaque SS treatment (MWU test, two-sided, $p = 0.52$). Finally, we evaluate if the selectors' reservation prices differ between the transparent and the opaque SS treatments, i.e., if *A* is more willing to pay to make a selection when choosing *C* signals that *A* cares about *B*'s preferences and thus about *B*'s well-being. The average reservation price was, however, equal in both conditions (MWU test, two-sided, $p = 0.55$). While 86% of *As* selected *C* in the opaque treatment, 92% did so in the transparent treatment, but this difference is not significant (Fisher's exact test, two-sided, $p = 0.66$).

Result 2.1 Selectors are not willing to pay higher prices to make a selection decision if it was transparent who made the selection decision than if it was opaque.

3.3 Reciprocal responses to selection decisions

Lastly, we analyze whether *B*s reward or punish *As* if *As* did or did not satisfy their team composition preferences, thereby testing our third hypothesis. We consider the transparent and the opaque treatments separately and initially analyze whether the *Bs* in the transparent treatment made their contribution conditional on whose selection choice—the computer's or *A's*—was implemented. In the transparent SS treatment, *B*s contributed on average 91.67 Taler to the public good when *A* paid to include *B*, and only 80.55 Taler when *A* did not pay to include *B*, but *B* was then randomly selected by the computer to be included in the group: this difference is not statistically significant (MWU test: $p = 0.29$). A similar result is observed when *A* paid to select *D*, in which case B contributed, on average, 21.67 Taler, which is less than the 31.96 Taler when *D* was randomly selected to be included because *A* did not pay to make a selection choice, but this difference is again not statistically significant (MWU test: $p = 0.34$).

We also compare the *B*s' contributions to the public good in the SS treatments with *B*s' decisions in other treatments. The *B*s' contributions should be highest in the transparent treatment, the second highest in the opaque treatment (when *B* could not know if *A* or the computer included *C*) and lowest in the RS treatment if *Cs* have been included. In this case, average contributions were 91.67 Taler in the transparent treatment, 84.61 Taler in the RS treatment (MWU test: $p = 0.65$) and 82.67 Taler in the opaque treatment (MWU test, transparent vs RS treatment,$p = 0.94$). The size effects of the average contributions in the RS treatment and the opaque treatment are

indistinguishable. This denotes that individuals are reluctant to punish or reward others if their responsibilities are opaque.

Conversely, if *D* was included, then *Bs* should contribute the least in the transparent treatment, the second lowest in the opaque treatment, and the highest in the RS treatment. We find that, in this case, *Bs*' average contributions were 35.97 Taler in the opaque treatment, which is almost identical to the average contributions in the RS decision (35.76 Taler, MWU test: $p = 0.97$). They were, as predicted, higher than in the transparent treatment, where *B*s contributed, on average, 21.67 Taler, or almost 40% fewer than in the other treatments, where contributions were above 30 Taler, but this difference is not statistically significant (MWU test, $p = 0.26$).

Result 3 There is no significant evidence that current group members reward or punish selectors because of negative or positive reciprocity.

4 Discussion, implications, and conclusion

This paper examined why and to what extent individuals who are responsible for selecting new group members discriminate against candidates disfavored by other current group members. As observed in the experiment, most selectors were in fact willing to pay a price to include a friend of an insider for both altruistic and strategic reasons. In fact, roughly 60% of them were willing to pay to select a particular candidate in the absence of taste or statistical reasons for the inclusion of any candidate. A large majority of those 60% based their actual selection decision on another group member's preferences, leading to the systematic exclusion of those who were not friends with a member of the group.

Group members' willingness to cooperate was almost 150% higher in groups that included a friend in comparison to those that included a stranger. This much higher rate of cooperation explains—*inter alia*—why endogenous team formation processes can lead to enhancements in output in an optimal setting (*c.f.* Herbst et al. 2015). The normative evaluation of this result, however, is ethically ambiguous: the observed effect, that selectors take into account the group composition preferences of other members and that this consideration enhances team productivity underlines, on the one hand, the value of employee referral programs (Cappellari and Tatsiramos 2015; Ioannides and Loury 2004; Topa 2011). On the other hand, however, these spill-over effects may lead to social environments in which preferences originate from prejudice or a biased perception of minority members' talents to a significant increase in discrimination and to the systematic exclusion of those who are disfavored by insiders.

By studying discrimination and group composition preference spill-over effects, we have introduced a new type of discrimination that emerges from strategic considerations ("strategic discrimination"). The reasons for discrimination go beyond those found in the analysis of atomized individuals, as in taste-based and statistical discrimination models. On the contrary, discrimination regularly emerges from group dynamics and autopoiesis (Luhmann 1995), i.e., organizations, groups, and networks are often self-reproducing in the sense that individuals have an incentive to recruit new group

members from often homogenous networks of current group members and, therefore, reproduce power structures. We thus suggest that future (field) studies investigate the role of group processes to assess the extent of discrimination and to explain how group dynamics alter "systems of discrimination" (Lang and Spitzer 2020).

Firms seeking to include individuals who, for some reason, are disfavored by existing employees can certainly design policies to include them, thereby achieving a more plural, diverse, and heterogeneous workforce and working groups. First, a manager's *strategic* motive to hire and include only those applicants favored by current employees might be attenuated by an increase in current employees' willingness to cooperate in heterogenous teams. Such an increase might be achieved by making their bonuses and performance assessments conditional on their levels of cooperation in heterogeneous teams. Second, regarding the *altruistic* motive to hire and include applicants favored by current employees, it is probably not sufficient to change employee behavior. Policies should, instead, focus on managers themselves, and on the recruitment process. By imposing a structured recruitment process with strict selection criteria, such as outsourcing the recruitment of employees or applying quotas, the discretionary power of managers who consider the prejudiced taste of their employees can presumably be limited and consideration of the group's composition preferences thereby remedied. Finally, directly addressing prejudices and taste-based discrimination in teams by way of inclusive policies and intergroup contact (Lenz and Mittlaender 2022) may reduce the source of discrimination in the first place.

Our findings imply that discrimination might not only be more widespread but also more persistent than previously predicted by taste-based or statistical discrimination models, because the composition of the group changes group members' willingness to cooperate and, thus, the overall output of the group. We find that teams in which some members share a social identity are regularly more cooperative. We provide an explanation as to why discrimination may persist in markets in these cases, and why competition might not reduce it. In our experiment, we focused on unraveling the major behavioral channels. We leave it for future research to experimentally vary the strength of other group composition preferences, the degree of strategic incentives, and the role of competition.

A limitation of this paper is that our empirical analysis is restricted to the selectors' and current group members' behavior. Future studies could investigate the behavior of the included candidate who could vary the contribution. For those who are reciprocal cooperators (Fischbacher et al. 2001), we can expect greater contributions from friends of current group members because they can expect greater contributions from their friends inside than strangers might. Moreover, people being hired based on the recommendations of their friends make an effort to return this favor by trying harder (see Topa 2011, for an overview), which is an example of reciprocal behavior. In contrast, some studies have also established that minorities or less able workers, who are often discriminated against, are more grateful when included and, therefore, might be often more cooperative than majority members (Montinari et al. 2016).

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Declarations

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