Promotions and Group Identity

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January 19, 2024

Abstract: How does group identity influence promotion decisions and what impact does it have on the performance of organizations through promotions? We provide answers based on two experiments in which we identify the effect of group identity on the employers' preferences regarding whom to promote, their expectations of the post-promotion effort of promoted and non-promoted workers, and the post-promotion effort itself. In both experiments, we find strong evidence of group identity biasing the employers' preferences. The observed group identity bias in the promotion decision significantly reduces efficiency. Contributions to the literature on promotions in organizations and discrimination in promotions are discussed.

Keywords: Group identity, in-group favoritism, post-promotion effort, post-promotion productivity, promotion decision

JEL codes: C91, M50

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1. Introduction

How does group identity affect promotion decisions and what impact does it have on the performance of organizations through promotions? Employing people with different genders, ethnic backgrounds, and countries of origin, most organizations consist of groups of people with different social identities. The identities do not have to depend solely on demographics but can be driven by personal preferences or created by business arrangements such as mergers that result in groups of employees with different corporate identities.[1] The existence of multiple group identities tends to induce organization executives to favor in-group members in their decision-making, which may in turn hurt productivity.[2] Among a variety of decisions made within a firm, promotion decisions are among those likely to be influenced by group identity.

Differences in promotion rates of certain observable groups have been documented in some settings and are often attributed to discrimination (Becker, 1957). For example, Blau and DeVaro (2007) survey the economic literature on gender differences in promotion rates, while DeVaro, Ghosh and Zoghi (2018) survey the literature on racial differences. Since data on employer preferences or tastes are not readily available, most of the existing literature focuses on statistical discrimination (Phelps, 1972; Arrow, 1972), exploiting variables correlated with the observed worker characteristics and relevant to productivity. Several papers (discussed in detail in Section 2) have provided intuitive theoretical explanations for discrimination in promotions, proposing a variety of reasons without appealing to taste-based discrimination or personal prejudice.

Complementary to these theoretical explanations, we contribute to the literature by experimentally investigating the presence of taste-based discrimination (or favoritism) in promotion and its effects on the performance of organizations, where we focus on productivities of workers at promoted positions and post-promotion effort incentives of promoted and non-promoted workers. Experimental methods are well-suited for this purpose because they allow us to observe employer tastes and beliefs about workers' performance.

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[1] A well-known example in Japan is the merger of Yawata Iron and Steel with Fuji Iron and Steel in 1970 which formed Nippon Steel Corporation, the second-largest steel manufacturer at that time. In that company, two distinct groups of employees with strong Yawata and Fuji identities continued to have existed for several decades (Tona, 2004).

[2] Becker (1957) argues that "tastes for discrimination" are the most important immediate cause of actual discrimination. When an employer discriminates against an out-group candidate, he does so to avoid the non-pecuniary, psychic costs of employing an out-group member. To emphasize the fact that the employer's preferences are unrelated to organizational objectives and to connect with this earlier literature, we henceforth refer to personal preferences as tastes.

Furthermore, in our specifically designed environments, we can control and systematically study the interaction of workers' productivity and effort (important determinants of the promotion decision) with the employer's tastes and beliefs.

The novelty of our study stems from our focus on post-promotion effort incentives of not only promoted and but also non-promoted workers. The literature on promotions in organizations has identified two roles for promotion practices; one role is a way to provide workers with incentives to exert efforts *before* promotion decisions are made, and the other role is a way for the organization to efficiently assign workers to promoted positions. Effort incentives *after* promotion decisions are made, despite their obvious importance, have been largely ignored in the literature with several experimental studies as exceptions (see Section 2.1 for details). Furthermore, because most promotion decisions inherently create winners and losers, post-promotion effort incentives of non-promoted workers play important roles in determining the performance of organizations.

To illustrate how group identity can influence promotions, consider a division manager of an organization who supervises several department managers and subordinates in each department. Suppose that one department manager position becomes vacant, and the division manager, who has an X-identity, must promote one of two candidates, one with an X-identity (in-group candidate) and the other with a Y-identity (out-group candidate), to the vacant position. Assessing the impact of group identity on promotion decisions requires us to deal with a range of contributing factors. Solely observing that the division manager promotes the in-group candidate is insufficient to conclude that the decision is biased. Promotion candidates typically have different productivities at the promoted position, and hence, holding everything else constant, promoting a more productive candidate yields better performance of the organization. In-group favoritism of the division manager, however, might bias the promotion decision, working in the direction of lowering the performance of the organization.

On top of possibly biasing the division manager's preferences regarding whom to promote, tastes stemming from group identity might also affect post-promotion effort exerted by promoted and non-promoted candidates, and the manager would form expectations regarding how group identity affects their effort. The expectations, in turn, would also affect the division manager's promotion decision. A payoff-maximizing manager compares the combined effort expected from the promoted and non-promoted worker under two scenarios:

when an in-group worker is promoted and when an out-group worker is promoted and makes the decision accordingly. With group identity, these effort expectations might become biased.

The existence of multiple channels through which group identity could operate presents a challenge for assessing its impact on the promotion decision and the overall performance of the organization. A comprehensive analysis of conditions under which each channel does or does not influence promotion requires observing the behavior of the employer and candidates in counterfactual situations that are unlikely to be present in the field (see Charness and Kuhn, 2011; Falk and Fehr, 2007; Falk and Heckman, 2009). To disentangle the above channels, we conduct two laboratory experiments. In both experiments we create an environment in which an employer has two candidates for promotion, an in-group worker and an out-group worker. The environment mimics the promotion features necessary to answer our research questions.

While the existing literature studying the impact of group identity on economic behavior includes only a few field-experimental studies (e.g., Goette, Huffman, and Meier, 2006), a related strand of literature on discrimination has seen an increased number of lab-in-the-field and field experiments (see Bertrand and Duflo, 2017 for a survey). Why do we then employ a lab experiment rather than a field experiment that would place the economic interaction of interest in a naturally occurring setting? A laboratory experiment offers an advantage when it comes to observing (and controlling for) variables that are unobservable or observable imperfectly in a field setting. In our case, observing employers' beliefs and workers' effort levels is crucial for identifying the channels through which group identity potentially biases promotion decisions. The value of a lab experiment lies in testing theoretical conjectures in the most rudimentary of environments, absent of confounding effects that may be present in the field. If no causal relationship between two variables is found in "sterile" laboratory conditions, such a relationship is highly unlikely to be present in the field. If, on the other hand, a laboratory test delivers evidence in favor of a particular channel, the underlying theoretical idea, which has now received empirical support, indicates the causal relationship between two variables. For example, that group identity is capable of biasing the employer's preferences in

promotions. While it is not prudent to generalize laboratory findings into the field, it is the verified theory that can be applied to the field setting and tested further for robustness.[3, 4]

In organizations, the candidates typically have different productivities at the promoted position. In Experiment 1, we incorporate this feature into the design by varying the workers' relative productivity upon promotion, which is fully observable to the employer. The design controls for the effort exerted by the workers after the promotion decision, unambiguously identifying the effect of group identity on the employer's tastes. Varying the relative productivity of candidate workers presents a diagnostic test of whether and if so to what extent group identity biases the employer's promotion decision. If the employer chooses to promote the in-group worker who has higher post-promotion productivity than the out-group worker, it is not clear whether the promotion decision is due to the employer's tastes or productivity difference, or both. In contrast, if the in-group worker has the same or even lower post-promotion productivity than the out-group worker, his promotion would be clear evidence of the division manager's tastes.

Experiment 2 focuses on workers' post-promotion effort incentives. Our experimental design controls for potential productivity differences by setting the productivity of the promoted position equal to the productivity of the non-promoted position. The promoted and non-promoted workers exert costly effort that benefits the employer, which enables us to study how group identity and the promotion decision together affect post-promotion effort. The employer may or may not fully consider the impact of group identity on workers' effort and take it into account when he decides whom to promote. The employer's tastes affected by group identity might also influence his promotion decision. To separate the effect of the employer's tastes from his expectation of workers' effort levels, we elicit the employer's expectations of effort levels and test whether these expectations are consistent with the actual exerted effort. This comparison could reveal an expectation bias, if it exists, which would in turn influence the promotion decision. We then verify whether the employer maximizes the combined effort

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[3] A similar methodological argument would apply if we tested our ideas in a field setting. If one finds support for an idea in a field experiment, the results do not generalize to other field settings, as the specificities of the workplace, economic interaction, and the environment in general, could have influenced the results. It is the received empirical support in experiments that increases our confidence that the underlying theory describes the world around us accurately.

[4] See also Charness and Chen (2020) for a discussion regarding when to use a laboratory or a field experiment to study the impact of group identity on economic behavior and Charness, Gneezy, and Henderson (2018) and Dutcher, Salmon, and Saral (2020) on the use of stated vs. real effort in economic experiments.

of the promoted and the non-promoted worker or whether the employer exhibits a costly decision bias (caused by tasted-based preferences) by promoting the in-group worker despite expecting a higher combined effort from promoting the out-group worker.

Experiment 2 contributes to the body of research on promotion tournaments by analyzing how promotions affect workers' effort incentives. The impact of perspective promotion on workers' pre-promotion effort has been studied intensively, whereas the impact on workers' post-promotion effort remains relatively underexplored, despite its obvious importance. Furthermore, we study the effort of not only promoted workers but also non-promoted workers. The impact of the promotion decision on non-promoted workers could result in unintended consequences, which is an issue that has also been largely ignored. By investigating post-promotion effort exerted by promoted and non-promoted workers, Experiment 2 allows us to identify the respective roles that the employer's tastes and effort expectations play in the promotion decision. Identifying these roles in turn enables us to better understand how group identity impacts on performance of organizations through promotion decisions.

The central conjecture we test in both of our experiments is based on the vast literature on the social identity theory (Chen and Li, 2009; Tajfel and Turner, 1979) indicating that employers could exhibit a group identity bias in their promotion decisions. That is, holding other factors constant, an employer is more likely to promote an in-group worker than an out-group worker.[5] Furthermore, Experiment 2 explores the following two conjectures. First, promoted workers exhibit positive reciprocity (for models of reciprocity see, e.g., Cox, Friedman and Sadiraj, 2008; Dufwenberg and Kirchsteiger, 2004; for empirical evidence, e.g., Fehr et al., 1993; Charness, 2004) towards the employer. That is, for in-group workers, a promoted worker exerts a higher effort compared to a non-promoted worker, and the same holds for out-group workers. Second, group identity affects workers' post-promotion effort. That is, for non-promoted workers, an in-group worker exerts a higher effort compared to a worker without group identity (which serves as our benchmark) due to in-group favoritism and the out-group worker exerts a lower effort compared to the worker without group identity due to out-group discrimination. The same reasoning applies to promoted workers.

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[5] Note that while our research questions and theoretical predictions address the (natural) comparison of in-group vs out-group encountered in everyday life, identifying the group identity effect in promotions requires us to compare promotion outcomes and behavior of in-group and out-group workers with their respective counterparts in a treatment where no group identity is present.

In Experiment 1, we find that the employer is more likely to promote an in-group worker when the productivity of the in-group worker and the out-group worker is the same. The shared group identity, therefore, acts as a tie-breaker in the in-group worker's favor. We also find evidence of promotion decision bias when the in-group worker is observably less productive than the out-group worker. Promoting a less productive in-group worker is costly to the employer as the promotion decision lowers overall performance; however, a biased decision is less likely to be made the greater the productivity difference is.

In Experiment 2, we find support for the reciprocity conjecture that a promoted worker exerts higher effort than a non-promoted worker, which is true for both in-group and out-group workers. Regarding the group identity conjecture, we find support for one of our hypotheses that a non-promoted out-group worker exerts lower effort than a non-promoted worker without group identity, but do not find support for the other hypothesis derived from the conjecture. Instead, for non-promoted workers we observe that the effort exerted by an in-group worker and a worker without group identity are not significantly different from one another. For promoted workers, the effort exerted by an in-group worker, an out-group worker, and a worker without group identity is not significantly different either. We provide a possible explanation for this result towards the end of Section 4.4.1.

Regarding the employer's expectations, we find, interestingly, that the employer correctly anticipates the post-promotion effort of both promoted and non-promoted workers, and hence group identity does not impact the promotion decision by biasing the employer's expectations. Regarding the employer's tastes, although the employer does not expect a significant difference in the combined effort from promoting an in-group or out-group worker, he predominantly promotes an in-group worker. The result that when there is no perceived cost of the preferential treatment of in-group members, group identity often serves as a tie-breaker about who gets promoted, is in line with our finding from Experiment 1. Furthermore, and again similar to Experiment 1, we also find that a large fraction of employers who expect a higher combined effort from promoting an out-group worker nevertheless promote an in-group worker. We show that this group identity bias in the promotion decision reduces efficiency.

In summary, our experiments disentangle several channels through which group identity influences the performance of organizations through promotion decisions. In Experiment 1, we find that group identity impacts the tastes of employers who promote an in-group worker when the in-group worker has the same or even noticeably lower productivity

compared to an out-group worker. In Experiment 2, we find that group identity again influences the tastes of employers who promote an in-group worker when they expect that promoting an out-group worker would yield the same or even a higher combined effort. In both experiments, we thus identify situations where the bias caused by shared group identity decreases efficiency.

Our study contributes to the literature on discrimination in promotion by demonstrating, in a laboratory setup, that employers' tastes can bias their promotion decisions, which can reduce the efficiency of organizations. Furthermore, our findings lead to managerial implications that procedures to prevent the impact of group identity in promotions would help improve the overall performance of organizations in terms of post-promotion productivity and post-promotion effort of promoted and non-promoted workers.

2. Relationship to the literature

Our study is related to three streams of literature: promotion in the internal labor market, explanation for discrimination in promotion, and economics literature on group identity. This section discusses these streams of literature in turn.

2.1 Promotions in the internal labor market

Promotions in organizations have been intensively studied as a central element in the analysis of internal labor markets. The literature on promotions in organizations has identified two distinct roles for promotion practices, as pointed out by Waldman (2003). One role is a way to provide incentives inside organizations by rewarding prior performance. Starting with Lazear and Rosen (1981), a large literature on promotion tournaments in creating incentives has evolved, where the fundamental idea is that the prospect of getting promoted and receiving a higher wage motivates workers to exert more effort or to invest more heavily in acquiring human capital (DeVaro and Morita, 2013).[6]

The other role is a way for the organization to efficiently assign workers to jobs. The basic setup in job assignment models of promotion is that jobs are ranked in terms of the extra value produced by a worker of greater ability, forming job ladders (Rosen, 1982; Sattinger, 1975). Gibbons and Waldman (1999a) explore a model of a job ladder under multiple periods

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[6] See also Malcomson (1984), Rosen (1986), Lazear (1989), and Prendergast (1993) for other influential studies of tournament incentives and Harbring and Irlenbusch (2003, 2008, 2011) for experimental tests of tournament design, including unintended consequences that tournament incentives might have on pre-promotion performance.

with a human-capital acquisition, where movement up the job ladder is interpreted as a promotion. Waldman (1984) explores signaling roles of promotions using a job assignment model, and Waldman (2003) incorporates the two roles of promotion in one model to show that favoring internal candidates for promotion can be understood as a response by employers to the problem of time inconsistency.[7] Job assignment can also be a source of fairness concerns (Danková, Morita, Servátka, and Zhang, 2022), an issue that could be exacerbated by group identity.

Tournament models focus on effort incentives before promotion, whereas job assignment models focus on employees' productivity after promotion decisions are made. Although pre-promotion effort and post-promotion productivity are both important determinants for the performance of organizations, there is another crucial determinant – effort exerted by promoted and non-promoted employees (winners and losers) after promotion decisions are made.

To the best of our knowledge, post-promotion effort has been mostly left unexplored in economic analyses of internal labor markets, except for several recent experimental studies. As one of such papers, McGee and McGee (2019) points out, "The tournament literature to date, however, overlooks an important – and fundamental – feature of actual workplace tournaments: … In practice, workers often continue to exert effort on behalf of firms after competitions finish." Johnson and Salmon (2016) explore the behavior of losers of promotion tournaments after the tournament is concluded by undertaking an experiment in which the design of the promotion tournament is varied to determine how tournament design affects post-tournament effort. They find evidence suggesting that a poorly designed tournament can lead to workers being discouraged. McGee and McGee (2019) find that tournament losers provide significantly less post-tournament effort than winners. Consistent with procedural fairness concerns, they observe that subjects who lose arbitrarily decided tournaments that disregard tournament effort choices supply even less post-tournament effort than other losers.[8] In contrast, a recent study by Zhang, Feltovich, and Zhang (2023) finds that when people first participate in a real-effort tournament and subsequently the tournament incentives are replaced

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[7] Gibbons and Waldman (1999b) survey both roles of promotion.

[8] The Peter Principle also focuses on post-promotion performance and suggests that workers perform worse after being promoted to their level of incompetence. Lazear (2004) explains that lower post-promotion output can be explained by the regression to the mean after the promotion standard has been satisfied. He further suggests that self-selection may improve job allocation efficiency while preserving incentive effects of promotion. In an experimental setting reproducing the Peter Principle, Dickinson and Villeval (2012) find no evidence of effort distortion and observe that the efficiency of promotion rules dominate self-selection.

by piece rate incentives (without competition against others), participating in a tournament increases real-effort of both winners and losers.

We contribute to the literature by investigating ways in which group identity affects promotion decisions and post-promotion performance through the productivity of promoted employees and the post-promotion effort of promoted and non-promoted employees. While addressing a different research question, our experimental design is related to that of Dickinson, Masclet, and Peterle (2018), who examine both the private benefits and spillover costs of labor market favoritism. In their experiment, an employer is matched with two workers, where each worker has a group identity that can either be the same or different from the employer's identity. Knowing the two workers' group identities, the employer offers either a high or a low wage to each worker. The data show that the wage offers favor in-group members, and workers positively reciprocate towards in-group employers by choosing higher effort in a gift-exchange game. Dickinson et al. (2018) also study favoritism associated with employment preference and unemployment. As unemployed workers are allowed to burn resources, the observed resource destruction is significantly greater when unemployment can be attributed to favoritism towards others.

In our setup, the employer promotes one (and only one) out of two workers while the other is automatically not promoted. This design feature allows us to investigate whether or not the employer exhibits taste-based group identity bias in the following sense. When an employer promotes the in-group worker, the promotion decision (i) is driven by the employer expecting higher overall productivity (or combined effort), or (ii) serves as a tie-breaker when the employer expects the same overall productivity when promoting either worker, or (iii) is made even though the employer expects higher overall productivity by promoting the out-group worker. We find that a large fraction of employers exhibit taste-based group identity bias in the sense of (ii) and (iii). Such an investigation of the employer's tastes is not undertaken by Dickinson et al (2018), due to their different research question.

2.2 *Explanation for discrimination in promotions*

Building on Waldman's (1984) insight that promotions serve as signals of worker ability, Milgrom and Oster (1987) suggest that, when job skills of disadvantaged workers are not easily discovered by potential new employers, promotion can enhance disadvantaged workers' visibility. They show that, in a competitive labor market equilibrium, firms profit by hiding talented disadvantaged workers in low-level jobs, and consequently these workers are promoted less often than others with the same education and ability.

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Following Milgrom and Oster (1987), DeVaro et al. (2018) extend the promotion signaling theory to generate new testable implications. In their model, tasks are allowed to differ substantially across job levels. When the opportunity cost of not promoting qualified non-whites/non-Asians becomes large, employers are less likely to inefficiently withhold promotions of minority workers. DeVaro et al. (2018) provide evidence from a single firm's personnel records that supports the model's predictions concerning promotion probabilities.[9]

Lazear and Rosen (1990) consider a model of male-female wage differentials in job ladders in which women are assumed to have the same distribution of labor market ability as men but have superior ability in nonmarket activities. The higher expected value of home time induces a higher probability of separation from current employers for women, and the privately optimal and socially efficient response is to require higher threshold levels of ability for female promotion. Athey, Avery and Zemsky (2000) study how diversity evolves at a firm with entry-level and upper-level employees who vary in ability and "types" (gender or ethnicity). A critical assumption in their model is that the ability of entry-level employees is increased by mentoring and that an employee receives more mentoring when more upper-level employees have the same type. As a result, optimal promotions are biased by type, and this bias may favor either the minority or the majority.

A dynamic model of hiring and promotion by Bjerk (2008) shows that underrepresentation of one group relative to another (e.g., females vs. males) in the top jobs can arise not only if one group has higher average skill than the other but also if firms are less confident in the precision of the pre-market and early market skill signals they observe from members of one group relative to the other. Underrepresentation can also occur due to fewer opportunities to signal skill before labor market entry.

3.3 *Economics literature on group identity*

While our main goal is to generate new knowledge of how labor relationships function, because of the nature of our research question our study is inherently related to the large social identity literature. Social identity theory proposes that perceived affiliation with social groups contributes to how a person forms his identity (Tajfel and Turner, 1986; Turner, Brown, and Tajfel, 1979). Ample experiments support the main prediction of the theory that a group

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[9] See also Gürtler and Gürtler (2019) for another promotion signaling model with two periods and two different groups of workers that can account for statistical and taste-based discrimination. They use the model to examine effects of positive discrimination policies.

membership leads to an in-group bias at the expense of the out-group (see Charness, Rigotti, and Rustichini, 2007; Charness and Chen, 2020; Chen and Li, 2009; Li, 2020, all of which survey the literature from the economics perspective). Group identity is an important determinant of economic decisions (Akerlof and Kranton, 2000, 2005; Chen and Li, 2009; Eckel and Grossman, 2005). When tasked with allocating money to others, people allocate more to their group members (Chen and Li, 2009; Tajfel, Billig, Bundy, and Flament, 1971). People also coordinate better (Chen and Chen, 2011) and cooperate more with in-group members (Eckel and Grossman, 2005; Goette, Huffman, and Meier, 2006; Morita and Servátka, 2013; Jiang and Li, 2019) as well as display more reciprocity towards them (Chen and Li, 2009; Yamagishi and Kiyonari, 2000).

Our contribution to the economics literature on group identity is two-fold. First, the vast majority of existing studies ask whether group identity mitigates inefficiencies while only a handful of studies explore the other side of the coin whether group identity has detrimental effects on economic outcomes (Chen, Li, Liu, and Shih, 2014; Cohn, Fehr, and Maréchal, 2014; Cohn, Maréchal, and Noll, 2015; Guo, Liang, and Xiao, 2020; Heap and Zizzo, 2009).[10] In some instances, group identity impacts behavior in unintended ways. For example, making a negatively perceived identity salient to people (such as living in a poor neighborhood), decreases cooperation (Li, de Oliveira, and Eckel, 2017). The prevalent positive effects reported in published studies might give the impression that group identity is a panacea to organizational issues, however, some studies show that the effects are limited. For example, in a bargaining environment, where one party can make a wasteful investment to increase its own bargaining power, group identity proves to be an ineffective solution as it is unable to overcome the existing economic incentives (Morita and Servátka, 2016). In line with this relatively small subset of group identity studies, our research question asks whether group identity impacts promotion decisions where there is scope for group identity to be detrimental to the performance of an organization.

Our second contribution to this strand of literature is methodological. To identify the channels through which group identity impacts promotions, we develop a novel experimental design that combines features of two popular approaches to studying the impact of group identity on economic decisions – *other-other* setup and *self-other* setup. In the other-other setup, the decision-maker splits a pie between an in-group and an out-group member without payoff consequence to himself (Chen and Li, 2009; Harris, Herrmann, Kontoleon, and Newton, 2015;

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[10] Relatedly, Charness and Chen (2020) note that in recent years identity has been used as a wedge to separate subgroups in everyday life and particularly in the political arena.

Tajfel et al., 1971). In the self-other setup, the decision maker is usually matched with either an in-group or an out-group partner one at a time (Eckel and Grossman, 2005; Fershtman and Gneezy, 2001; Morita and Servátka, 2013). The decision maker's payoff maximization conflicts with favoring another participant, making the self-other setup a more conservative tool to detect group identity bias and arguably also more relevant to economic applications. Our inquiry calls for combining both approaches: we use a richer version of the other-other setup to model the promotion decision between an in-group and an out-group worker, where the employer bears monetary consequences of the promotion decision due to post-promotion effort (a feature of self-other setup).

3. Experiment 1: Varying the relative productivity of workers

3.1 Experimental design

Experiment 1 focuses on employers' tastes to promote an in-group worker when promotion candidates have different productivities at the promoted position. The opportunity cost of the group identity bias that the employer is willing to incur is measured by the difference in post-promotion productivities, which are observable to the employer in our experimental design. It controls for the effort exerted by workers after the promotion decision, to ensure that the employer's promotion decision is not affected by reciprocity considerations.

Experiment 1 includes two treatments implemented in an across-subject design. In the Group Identity treatment participants are divided into two groups (referred to as teams in subject instructions, provided in Appendix A): Team Green and Team Blue. In economic interactions, such as the one we are studying, the tendency to favor in-group members often conflicts with the decision maker's monetary self-interest, and merely assigning participants into groups (with resulting weak group identity salience) might not be sufficient to counter the individual incentives. To establish a strong group identity, we use a procedure akin to the one developed by Morita and Servátka (2013). The procedure parallels how group identity is established in everyday life where group identity often creates a bond between in-group members but does not necessarily turn out-group members into competitors or enemies. In the Group Identity treatment, the promotion decision depends on both group identity and the relative productivity of workers. To separate the two effects and analyze how group identity interacts with productivity differentials between workers, our design includes a Control treatment where there are no teams and thus no distinct group identity.

Upon entering the laboratory, each participant randomly picks a cubicle number from a container. In the Control treatment, the numbers are all printed in black. In the Group Identity

treatment, the numbers are printed either in blue or in green, assigning participants to the respective teams. Team Blue is seated in the front three rows of the lab, and Team Green is seated in the rear three rows. In this treatment, the lab cubicles are labeled with respective team colors, and so are the screen headers and instruction sheets. In contrast, all visual elements are in grayscale in the Control treatment. Social psychology research demonstrates that visible manifestations of identity, such as name or color, reinforce group identity and enhance cooperation among in-group (Brewer, 1979, 1991). Inducing group identity allows us to control the group composition and perceived strength of group identity. The major advantage of random group assignment is obtaining probabilistically equivalent groups.[11]

Both the Group Identity and Control treatments consist of four stages:

Stage 1: Helping task

The purpose of the helping task is to further strengthen team identity.[12] Each participant is presented with three trivia questions. The questions are randomly drawn from a trivia question bank (Appendix B) and are the same for everyone in a particular experimental session but can vary across sessions. Participants have five minutes to use text-based chat in z-Tree (Fischbacher, 2007) to provide help to or to receive help from each other. In the Group Identity treatment, the members of Team Blue cannot observe nor contribute to the Team Green chat and vice versa. In the Control treatment, participants are assigned to two groups without any particular identity to keep the chat size comparable across treatments. Following the chat, participants individually submit their answers to earn 400 tokens for each correct one. Participants do not learn their earnings or the correct answers until the end of the experiment. This is to control for the strength of induced group identity which could suffer by having received wrong advice from team members.

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[11] Previous studies assign participants into induced groups based on their performance in a task (Eckel and Grossman, 2005), by their preference over stimulus unrelated to the experimental task (e.g., the popular Klee/Kandinsky paintings preference task; Chen and Li, 2009; Tajfel et al., 1971), or randomly (Chen and Chen, 2011; Chen and Li, 2009; Morita and Servátka, 2013).

[12] Several experimental economics studies report that to observe group identity effects, highly salient group identity is crucial and that it can be achieved through the group working towards a common goal and by group members helping each other (Charness et al., 2007; Chen and Chen, 2011; Eckel and Grossman, 2005; Morita and Servátka, 2013). Strong effects of group identity are also reported in studies that make use of natural identities (e.g., Chen et al., 2014; Fershtman and Gneezy, 2001; Fershtman, Gneezy, and Verboven, 2005; Benjamin, Choi, and Fisher, 2016; Bernhard, Fischbacher, and Fehr, 2006; Goette et al., 2006; Goette, Huffman, and Meier, 2012). However, for certain research questions, natural identities could result in loss of control, for example due to self-selection.

Stage 2: Promotion decision

At the beginning of Stage 2, participants are randomly assigned to be either an employer (one-third of the participants in each session) or a worker (two-thirds of the participants). We implement neutral framing, referring to the employer as Decision Maker and the workers as Recipients.

Each employer in the Group Identity treatment is matched with two workers: one from the same team (an in-group worker) and another one from the other team (an out-group worker). Workers know the team affiliation of their employer and the employer knows the team affiliation of each worker. In the Control treatment, there are no teams, and therefore no distinct group identity is established. Each employer in the Control treatment is matched with two workers, one labeled X and one labeled Y.[13]

Only the employer makes decisions in Stage 2. The workers are passive and cannot influence the employer's decision. All decisions and earnings are announced at the end of the experiment. We implement a multiple price list to study whether the employer's decisions are biased towards promoting in-group workers across seven different scenarios (see Table 1).[14] In each scenario, the employer has three choices and can select the Green worker, the Blue worker, or indicate being Indifferent. In the last case, the promoted worker is selected randomly by the computer with a 50% probability. The relative productivity of candidates varies across scenarios and is represented as the number of tokens the employer receives for selecting a particular worker in each scenario. (In the instructions, productivity is referred to as Earnings). The employer's earnings from selecting an in-group worker (worker X in the Control treatment) are 3,000 tokens in all scenarios, while the earnings from selecting an out-group worker (worker Y) range from 2,700 to 3,300 in 100 token increments. The earnings from selecting an in-group worker (X) are higher than the earnings for selecting an out-group worker (Y) in Scenarios 1-3, equal in Scenario 4, and lower in Scenarios 5-7. As explained in the instructions,

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[13] The design counterbalances whether worker X appears on the left- or right-hand side of the computer screen. We also counterbalance whether it is worker X or worker Y who has fixed productivity across scenarios. For clarity of presentation, in the paper we refer to worker X as the worker with fixed productivity.

[14] When using multiple price lists, multiple switching behavior is commonly observed. In our experiment, this would manifest as the employers choosing first one worker, then the other, and then switching back to the first worker as they progress through the list. Such inconsistent behavior is a problematic phenomenon that can be a result of lack of salience (Bruner, 2011), participant indifference (Andersen, Harrison, Lau, and Rutström, 2006) or simply a lack of understanding of the procedures, or an error made by the participant. We employ two measures to reduce multiple switching. Following Bruner (2011), we enhance the instructions with a script aimed at aiding comprehension of the multiple price list mechanism. The script was read aloud to participants together with the instructions. Similarly to Andersen et al. (2006), we also expand the binary choice between an in-group and an out-group worker in each scenario by adding an option to explicitly indicate indifference.

one of the seven scenarios is randomly selected for payments at the end of the experiment. A worker receives 2200 tokens if selected, and zero if not selected.

Table 1. Productivity from selecting an in-group or an out-group worker in the seven implemented scenarios

Scenario	Productivity from selecting an in-group worker (X)	Productivity from selecting an out-group worker (Y)
1	3000	2700
2	3000	2800
3	3000	2900
4	3000	3000
5	3000	3100
6	3000	3200
7	3000	3300

Note: The selected worker receives 2200 tokens in all scenarios.

Stage 3: Expectations elicitation

In Stage 3, we elicit beliefs to test whether workers expect the employer to be influenced by group identity. Note that while in theory expectations inform decisions, it is possible that our participants did not explicitly consider them when making decisions. To avoid making expectations salient during the decision-making process, which could influence the observed behavior, we collect the beliefs only after the promotion decision has been made. To keep the task symmetric in the sense that employer participants can earn money in Stage 2, we ask each employer to state his (second-order) beliefs about these expectations.[15] Both types of beliefs are elicited using incentivized using a quadratic scoring rule. The details are provided in Appendix C.

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[15] To distinguish between the workers' and the employer's beliefs, we refer to the workers' beliefs as expectations (of promotion) while keep referring to the employer's beliefs (about workers' expectations)..

One of the scenarios, different from the scenario selected in Stage 2, is then randomly selected for payment.[16] To avoid confounding behavior in Stage 2 by what is coming in the next task, participants learn about the expectation elicitation only after Stage 2 is completed.

Stage 4: Manipulation check

Immediately before earnings are displayed, participants rate the degree of their identification with the group using the "Inclusion of In-group in the Self Scale," (henceforth IGIS; Aron, Aron, and Smollan, 1992; Tropp and Wright, 2001). This manipulation check measure is not incentivized. In the Group Identity treatment participants report their identification with their own and with the other group. In the Control treatment, they are asked about the whole group of participants in the session. Participants report statistically significantly higher IGIS scores in the Group Identity treatment than in the Control treatment (see Appendix D).

At the end of the experiment, the participants are shown their decisions and their earnings from individual stages. The correct answers to trivia questions are also revealed. The manipulation check is then repeated to gauge the impact of the actual behavior on identification with the two groups. Finally, participants are asked to fill out a short questionnaire. After completing the questionnaire, they are paid privately in the control room located at the back of the laboratory.

3.2 Procedures

The experiment took place in the MGSM Vernon L. Smith Experimental Economics Laboratory at Macquarie Business School, Sydney, with 216 participants. The average age was 22.8 years, with 50% of the participants being women. An experimental session lasted on average 50 minutes, including the initial instruction period and the payment of participants. All earnings were denoted in *tokens,* with the exchange rate of 200 tokens = 1 AUD announced in the instructions. The average earnings were AUD 17.60. The payoff protocol was single-blind

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[16] We select different scenarios for Stage 2 and Stage 3 payoffs to avoid the portfolio effect which would be possible if both an outcome and one's expectation about this outcome were incentivized (Cox, Sadiraj, and Sadiraj, 2008; Cox and Sadiraj, 2019; Holt, 1986). A risk-averse worker with high promotion expectations might wish to indicate low expectations instead – this way, if the same scenario is chosen for Stage 2 and Stage 3 payoffs, he receives some payoff irrespective of the employer's decision. By instructing the participants that different scenarios will be randomly selected, we remove the opportunity to hedge.

with complete anonymity between participants. The experiment was programmed in z-Tree (Fischbacher, 2007) and participants were invited via ORSEE (Greiner, 2015).

3.3 Hypotheses

Social identity theory (Chen and Li, 2009; Tajfel and Turner, 1979) implies that the employer exhibits in-group favoritism in his promotion decisions. That is, holding other factors constant when productivity is observable, the employer is more likely to promote an in-group worker. Our identification strategy relies on comparing the likelihood of promoting the in-group worker relative to a worker without group identity to separate the group identity effect from the impact of relative productivity.[17] Economic intuition further suggests that as the productivity differential between the workers increases in favor of the out-group worker, the bias toward promoting the in-group worker diminishes.

In our seven scenarios, there are three cases based on the relative productivity of candidates: a worker can be more, equally, or less productive than the other worker. To identify the group identity bias, we formulate our testable hypotheses concerning these three cases and compare the probability of an in-group worker being promoted relative to a worker without identity, holding the relative productivity constant. Because of the binary nature of the promotion decision, we omit the hypotheses regarding the out-group worker. If the employer is more likely to promote an in-group worker, it means that an out-group worker is less likely to be promoted.

_H1a:_ _The employer is more likely to promote a more productive in-group worker than a more productive worker without group identity. (Scenarios 1-3)_

_H1b:_ _The employer is more likely to promote an equally productive in-group worker than an equally productive worker without group identity. (Scenario 4)_

_H1c:_ _The employer is more likely to promote a less productive in-group worker than a less-productive worker without group identity. (Scenarios 5-7)_

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[17] In our design, the employer chooses between an in-group and an out-group worker and by promoting one, the other is not promoted. As a feature of this symmetrical design, the probability of promoting the in-group worker relative to a worker with no group identity is 1 – probability of promoting the out-group worker relative to a no group identity.

3.4 Results

We first investigate the employer's promotion decisions and examine whether they are biased towards promoting the in-group worker. We then analyze workers' promotion expectations and investigate whether the employer's promotion decision is consistent with his second-order belief (i.e., his belief of the workers' expectations to be promoted). Throughout the paper, we compare the employers' promotion decisions and workers' expectations of being promoted using the Fisher's exact test and compare the post-promotion effort using the Mann–Whitney test when the samples are independent and the Wilcoxon signed-rank test when the samples are matched. All reported tests are two-sided.

3.4.1 Employers' promotion decisions

Our data show that employers promote the in-group worker more often.[18] In Scenarios 1 to 3, the in-group candidate (in the Group Identity treatment) is more productive and the employer experiences no conflict between the group identity bias and his monetary interest. Regardless of the treatment, the majority of employers choose to promote the more productive worker in all three scenarios, and we find no statistically significant differences in the promotion decisions between the Group Identity and Control treatment (p=0.193, 0.254, and 0.647 for Scenarios 1-3, respectively). The comparison of the promotion decisions is presented in Table 2.

Result 1a: *The employers are equally likely to promote a more productive in-group worker as a more productive worker without group identity. (Scenarios 1-3.)*

Table 2 reports the employers' choices in the seven scenarios which vary the productivity level of the out-group worker (Y), for both the Group Identity and the Control treatments, including the results of the Fisher's exact test comparing the promotion decisions between the Group Identity and Control treatments.

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[18] Note that promoting an in-group worker might be driven by in-group favoritism and/or out-group discrimination (see Morita and Servátka, 2013). Due to the nature of our research question regarding the promotion decision, our design does not distinguish between the two explanations (but does so for the employer's effort expectations and workers' effort). If we detect an impact of group identity on the promotion decision, we simply refer to it as group identity bias.

Table 2. Productivity and group identity in promotion decisions

Scenario	Productivity from selecting an in-group worker (X)	Productivity from selecting an out-group worker (Y)	Treatment	Employer's promotion decision			P values of Fisher's exact test (Group Identity vs Control)
				In-group worker / X	Indifferent	Out-group worker / Y	
1	3000	2700	Group Identity	31	0	4	0.193
			Control	35	1	1	
2	3000	2800	Group Identity	30	0	5	0.254
			Control	34	1	2	
3	3000	2900	Group Identity	30	2	3	0.647
			Control	34	2	1	
4	3000	3000	Group Identity	16	15	4	0.035
			Control	7	20	10	
5	3000	3100	Group Identity	6	0	29	0.027
			Control	1	3	33	
6	3000	3200	Group Identity	8	1	26	0.064
			Control	2	1	34	
7	3000	3300	Group Identity	2	2	31	0.451
			Control	0	2	35	

In Scenario 4, there is no productivity differential between the candidates. In the Group Identity treatment, 16 out of 35 employers promoted the in-group worker, 15 were indifferent, and only four promoted the out-group worker. In the Control treatment, seven out of 37 employers promoted worker X, 20 were indifferent, and 10 promoted worker Y. The difference in frequencies between treatments is statistically significant ($p=0.035$), demonstrating a group identity bias in promotion decisions.

Result 1b: _Employers are more likely to promote an equally productive in-group worker than an equally productive worker without group identity. (Scenario 4.)_

In Scenarios 5-7, the in-group candidate (X) is less productive than the out-group candidate (Y). In Scenarios 5 and 6, in the Group Identity treatment, a less productive worker

is more likely to be promoted if he is an in-group worker, than a worker without group identity in the Control treatment (p=0.027 and 0.064 for Scenario 5 and 6, respectively). This result indicates a strong group identity bias as the employer is sacrificing earnings to promote the in-group worker despite the out-group worker being more productive. It is worth noting that although the bias in Scenarios 5 and 6 is significant, it is not to the extent observed in Scenario 4. When the productivity differential increases to 300 tokens in Scenario 7, the group identity bias disappears (p=0.451).

Result 1c: _Employers are more likely to promote a less productive in-group worker than a less productive worker without group identity if the productivity differential is relatively small (Scenarios 5-6). As the productivity differential increases, the employers promote a more productive out-group worker and the group identity bias disappears (Scenario 7)._

3.4.2 Workers' expectations of being promoted

Are our findings that employers exhibit group identity bias of promoting more in-group workers consistent with workers' expectations? In an environment where the employer makes a binary decision to promote one of the two candidates, the in-group and the out-group worker may formulate their expectations differently relative to the workers without group identity and expect in-group favoritism and/or out-group discrimination from the employer.[19] Table 3 presents workers' expectations of being promoted. Panel A on the left compares the elicited expectations of in-group workers with the expectations of workers without group identity. The comparison tests whether the in-group workers expect in-group favoritism. Panel B on the right compares the expectations of out-group workers with the expectations of workers without group identity. The comparison tests whether the out-group workers expect out-group discrimination.

We find no evidence of in-group favoritism in the workers' expectations of being promoted, irrespectively of the relative productivity of workers. The Mann-Whitney test, presented in the last column of Panel A, does not detect a statistically significant difference in the expectations of in-group workers compared to the workers without group identity in any of the seven scenarios.

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[19] Note that our design enables us to make a distinction between expectations of in-group favoritism and out-group discrimination because beliefs are not binary, which in turn sheds light on their possible presence in the employer's decision.

We do, however, find some evidence of out-group discrimination in the workers' expectations of being promoted. For each of the scenarios in which the out-group candidate is less productive (Scenarios 1-3), the Mann-Whitney test, presented in the last column of Panel B, does not detect a statistically significant difference in the expectations of out-group workers compared to the workers without group identity. In Scenario 4, where there is no productivity difference between the two candidates, the out-group workers expect a chance of 41.6% to be promoted whereas the workers without group identity expect a 60.6% chance. The difference is statistically significant ($p=0.040$) and demonstrates that out-group workers expect to be discriminated against. The finding is consistent with Result 1b that the out-group workers expect they are less likely to be promoted compared to the equally productive worker without group identity. For each of the scenarios in which the out-group candidate is more productive (Scenarios 5-7), there is no statistically significant difference in the expectations of out-group workers compared to the workers without group identity. (In Scenario 6, the difference is weakly insignificant; $p=0.088$)

Overall, we find Result 1b to be consistent with the workers' expectations. When the candidates have equal productivity, we find evidence of out-group discrimination, but not in-group favoritism. However, we do not find strong evidence of group identity bias (either in-group favoritism or out-group discrimination) in workers' expectations when the two candidates differ in productivity. In line with Result 1a, workers do not expect the employer to display group identity bias when the in-group candidate is more productive. In contrast to Result 1c stating that employers are more likely to promote a less productive in-group candidate, workers do not expect the employers to display such bias.

Table 3. Workers' expectations of being promoted

Scenario	Panel A: In-group favoritism				Panel B: Out-group discrimination			
	Productivity	Expectations of being promoted		Mann-Whitney test p-value	Productivity	Expectations of being promoted		Mann-Whitney test p-value
		In-group worker	Worker without group identity			Out-group worker	Worker without group identity	
1	3000	89.2	84.3	0.624	2700	20.8	27.4	0.543
2	3000	83.7	73.8	0.557	2800	24.6	21.2	0.504
3	3000	80.2	79.5	0.878	2900	25.4	32.4	0.692
4	3000	61.8	60.6	0.895	3000	41.6	60.6	0.040
5	3000	28.7	39.4	0.334	3100	73.1	80.6	0.180
6	3000	25.5	27.2	0.564	3200	73.3	82.7	0.088
7	3000	25.5	36.5	0.511	3300	81.0	85.8	0.168

3.5 Summary

In Experiment 1, we find that employers are more likely to promote an in-group worker not only when the productivity of the in-group and the out-group workers is the same but also when the in-group worker is observably less productive. The workers expect the former result but not the latter. We also find that the employers' second-order beliefs capture the changes in the promotion decision due to the productivity differential and group identity bias. (The results are available in Appendix C).

4. Experiment 2: Post-promotion effort

4.1 Experimental design

Complementary to Experiment 1 which focuses on workers' different productivities at the promoted position, Experiment 2 focuses on their post-promotion effort. That is, Experiment 2 studies how group identity and the promotion decision together affect workers' post-promotion effort, which is an important determinant of the performance of organizations. To identify the source of the potential group identity bias in deciding whom to promote, we elicit the employer's expectations of the workers' effort levels and test whether they are consistent with the actual effort; a comparison that might reveal a bias in expectations which in turn could bias the promotion decision. We then verify whether the employer maximizes the combined effort (the sum of effort exerted by the promoted and the non-promoted worker) or

exhibits a decision bias by promoting an in-group worker despite expecting a higher combined effort from promoting an out-group worker. We check whether the decision bias (as it is the promotion decision that the workers respond to), if present, reduces the combined effort.

We again implement a Group Identity treatment and a Control treatment and follow the same procedures of assigning participants into groups and creating group identity as in Experiment 1. Each treatment consists of four stages:

Stage 1: Helping task

The helping task is identical to Stage 1 in Experiment 1.

Stage 2: Promotion decision and effort provision

At the beginning of Stage 2, participants are randomly assigned to be either an employer (one-third of participants) or a worker (two-thirds of participants). Each employer in the Group Identity treatment is matched with two workers: one from the same team (an in-group worker) and another one from the other team (an out-group worker). Workers know the team affiliation of their employer and the employer knows the team affiliation of each worker. In the Control treatment, there are no teams, and no distinct group identity is established. Each employer in the Control treatment is matched with two workers, one labeled X and one labeled Y.

In Stage 2, the employer's task is to make a promotion decision by assigning one worker to a High position and the other one to a Low position. The worker assigned to the High position receives a wage of 90 tokens and the worker assigned to the Low position receives 60 tokens. The employer pays these wages from his endowment of 250 tokens. The employer's earnings in Stage 2 are thus 100 tokens (=250-90-60) plus the earnings from the effort provided by the workers.

Each worker's task is to choose how much effort to exert. We employ the strategy method to elicit the workers' decisions (Brandts and Charness, 2011; Selten, 1967). The workers are not informed about the employer's decisions when deciding on effort; hence, each worker submits an effort decision for both the High and Low positions.

Each unit of effort increases the employer's earnings by 5 tokens.[20] Effort is costly to the worker, as specified in Table 4. The table is presented to all participants in the printed instructions.

Table 4. Cost-of-effort schedule

Effort e	0	1	2	3	4	5	6	7	8	9	10
Cost of Effort $c(e)$	0	0	1	2	4	6	8	10	12	15	18

The implemented cost-of-effort schedule is adapted from Fehr, Kirchsteiger, and Riedl (1993) and expanded to allow for zero effort at zero cost. This additional option allows for spiteful behavior towards the employer that could manifest by providing the effort of zero, even though providing the effort of one does not cost the worker anything.

Stage 2 is a one-shot interaction. The worker's earnings depend on the employer's promotion decision and own effort choice for the assigned position and are calculated as follows:

$$\pi_H = w_H - c(e_H)$$

$$\pi_L = w_L - c(e_L)$$

where w_H is the wage in the High position, w_L is the wage in the Low position, $c(e_H)$ is the cost of effort for the worker in the High position, and $c(e_L)$ is the cost of effort for the worker in the Low position. We parameterize wages to yield $w_H = 90$ and $w_L = 60$. The employer's earnings are calculated as follows:

$$\pi_E = v - (w_H + w_L) + 5 * (e_H + e_L)$$

where v is the employer's initial endowment, $v=250$, e_H is the effort exerted by the worker in the High position and e_L is the effort exerted by the worker in the Low position.

Before making their decisions, all participants must correctly calculate earnings for the employer, the worker in the High position, and the worker in the Low position in three hypothetical scenarios. The group affiliation of the employer is not specified in these scenarios and there is diversity in the employer's decisions and effort levels provided by workers, to

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[20] Our design thus controls for the impact of marginal productivity of effort which could possibly interact with group identity (see Fehr, Gaechter, and Kirchsteiger, 1996). See, e.g. Levy & Zhang (forthcoming) for an experiment where the effectiveness of promotions and demotions depends on the ability of workers.

minimize the likelihood of these comprehension questions influencing the participant's subsequent behavior in Stage 2.

Stage 3: Expectations elicitation

Similarly to Experiment 1, we elicit workers' expectations of being promoted using a quadratic scoring rule. However, unlike in Experiment 1, we elicit the effort levels that the employer expects workers to exert. The elicitation takes place before the workers learn the employer's promotion decision and before the employer learns the effort choices. The details are provided in Appendix C.

Stage 4: Manipulation check

The manipulation check procedure is identical to Experiment 1. Our manipulation is successful as participants again report statistically significantly higher IGIS scores in the Group Identity treatment than in the Control treatment (see Appendix D).

4.2 Procedures

Experiment 2 was conducted with 270 new participants (i.e., Experiment 1 participants were barred from signing up) and followed identical procedures to Experiment 1. The average age of participants was 22.5 years, with 42% of the participants being women. An experimental session lasted on average 70 minutes, including the initial instruction period and the payment of participants. The average earnings were AUD 23.30. Experiment 2 instructions are provided in Appendix A.

4.3 Hypotheses

We first formulate hypotheses derived from the reciprocity conjecture. Reciprocity models (Cox, Friedman, and Sadiraj, 2008; Dufwenberg and Kirchsteiger, 2004) predict that a promoted worker exerts higher effort than a non-promoted one. Our two versions of this testable hypothesis hold the group membership constant.

H2a: A promoted in-group worker exerts higher effort than a non-promoted in-group worker.
H2b: A promoted out-group worker exerts higher effort than a non-promoted out-group worker.

H2c: A promoted worker without group identity exerts higher effort than a non-promoted worker without group identity.

Second, we investigate whether group identity and the promotion decision together affect the post-promotion effort. Chen and Li (2009) find that people are more likely to reward an in-group rather than an out-group member for good behavior, and at the same time are more forgiving towards an in-group than an out-group member for bad behavior. We apply Chen and Li's (2009) finding to develop our hypotheses, where we interpret a promotion to be perceived by the worker as kind and the lack of promotion as unkind behavior by the employer. We then expect that, compared to the out-group worker, the in-group worker reciprocates more and hence exerts higher effort when promoted. By the same token, the in-group worker is also more forgiving if not promoted and hence exerts higher effort than the out-group one. As before, for cleaner identification, our hypotheses compare the behavior of in-group and out-group workers to a neutral case without group identity. The in-group favoritism, therefore, results in stronger positive (weaker negative) reciprocity towards the employer than in the case without group identity. On the contrary, an out-group worker exhibits weaker positive (or stronger negative) reciprocity towards the employer than in the case without group identity, manifesting out-group discrimination. This leads to hypotheses H3a-H3d presented below.

H3a: A promoted in-group worker exerts higher effort than a promoted worker without group identity.
H3b: A promoted out-group worker exerts lower effort than a promoted worker without group identity.
H3c: A non-promoted in-group worker exerts higher effort than a non-promoted worker without group identity.
H3d: A non-promoted out-group worker exerts lower effort than a non-promoted worker without group identity.

Third, we test whether the employer's expectations of workers' effort are consistent with the above reasoning. (The reader can think of this as corresponding Hypotheses H2a[e]-H2b[e] and H3a[e]-H3d[e], where the superscript e refers to expectations).

Fourth, we ask whether the employer exhibits group identity bias by promoting the in-group worker despite expecting a higher combined effort from promoting the out-group worker and whether the bias, if present, reduces the combined effort. Note that the directional

hypotheses do not permit a conclusion about whether a higher combined effort is achieved by promoting the in-group or out-group worker because the outcome depends on the magnitudes of the impact of group identity on promoted and non-promoted workers. We abstain from formulating specific hypotheses regarding how the promotion decision affects the combined effort.

Our experiment, however, is designed to identify whether and how group identity biases the promotion decision. We will undertake our investigation through the following three steps:

(1) To test whether the employer's expectations are influenced by group identity, we will compare the effort expectations in the Group Identity treatment to the expectations in the Control treatment where there is no group identity.

(2) To verify whether the employer's expectations are correct, we will compare them with the actual exerted effort (separately for the Control and Group Identity treatments) to gauge whether the employer internalizes the impact of group identity on workers' effort or whether group identity introduces a bias in expectations.

(3) To evaluate whether the promotion decision is driven by payoff maximization or whether it is subject to a taste-based group identity bias (possibly on top of biased expectations), we will compare the expected combined effort from promoting the in-group vs out-group worker (which we can, thanks to the use of the strategy method) and contrast it with the employer's promotion decision.

By following these steps, we can determine whether group identity biases the promotion decision, and, if it does, we can find out whether the biased decision is due to the employer's effort expectation bias, or taste-based group identity bias, or both. And the last step allows us to detect whether the group identity bias, if present, reduces the combined effort.

4.4 Results

4.4.1 Post-promotion effort

We hypothesized that a promoted worker is motivated by reciprocity (hypotheses H2a-2b). Our data indeed show that promoted workers exert higher effort than non-promoted workers. Promotion – which makes the promoted worker better off because of a higher wage – increases effort for both the in-group and out-group worker. With group identity, in-group

workers choose an average effort of 4.87 when promoted but only 2.31 when not promoted, with the difference being statistically significant (p<0.001). Out-group workers choose an average effort of 4.70 when promoted and 1.89 when not promoted. The difference is also statistically significant (p<0.001). When there is no group identity, the promoted workers choose an average effort of 4.28 while the non-promoted workers only 2.26, with the difference being statistically significant (p<0.001).

Result 2 (a,b,c): *Promoted workers exert higher effort than non-promoted workers, irrespective of group identity.*

Our second objective is to assess the effect of group identity on post-promotion effort (hypotheses H3a-3d). We find that group identity affects the non-promoted workers' effort but surprisingly does not impact the promoted workers' effort. Summary statistics and comparisons for the in-group and out-group workers' effort are presented in Table 5. The effort exerted by promoted in-group workers is not statistically significantly different from the effort exerted by workers without group identity. The same holds for the effort of promoted out-group workers and workers without group identity. We also find no difference between the effort exerted by the promoted in-group workers and promoted out-group workers (p=0.769) nor between the non-promoted in-group workers and out-group workers (p=0.121). However, while the effort of non-promoted in-group workers is not statistically different from the effort of non-promoted workers without group identity (p=0.870), the non-promoted out-group workers' effort is (weakly) significantly lower than the effort of workers without group identity (p=0.052). The last result indicates a stronger negative reciprocity by the out-group workers for not being promoted.

Result 3a and 3b: *There is no statistically significant difference in effort exerted by promoted in-group workers, out-group workers, and workers without group identity.*

Result 3c: *There is no statistically significant difference in effort exerted by non-promoted in-group workers and non-promoted workers without group identity.*

Result 3d: *Non-promoted out-group workers exert lower effort than non-promoted workers without group identity.*

We now discuss a possible explanation of why Hypothesis 3a and 3b are not supported by Result 3a and 3b. Recall that we apply Chen and Li's (2009) finding to develop our hypotheses by interpreting promotion as kind and non-promotion as unkind from the perspective of workers. We (ex-post) conjecture that, in our design, the perception of promotion as kind is stronger for out-group workers than for in-group workers.

To see why, notice that, in our design, the employer must choose one and only one worker for promotion, and is not allowed to promote both in-group and out-group workers, or promote neither of them. In such an environment, if the out-group worker is promoted, the worker is pleasantly surprised because the employer's decision comes at the cost of not promoting the in-group worker. In contrast, the in-group worker is not surprised when promoted, leading to the out-group worker's stronger perception of promotion being kind than the in-group worker's perception. If this effect cancels out the in-group worker's stronger incentive to reciprocate kindness, the effort exerted by the in-group and the out-group workers would not differ. This provides an explanation for Results 3a and 3b.

Table 5. Workers' post-promotion effort

Treatment\Positions	Promoted in-group	Promoted out-group	Non-promoted in-group	Non-promoted out-group
Group Identity Mean (standard dev.)	N = 61 4.87 (3.34)	N = 61 4.70 (3.59)	N = 61 2.31 (2.53)	N = 61 1.89 (2.60)
Sign-rank test (Promoted vs. Non-promoted)	p<0.001 for in-group workers	p<0.001 for out-group workers		
Control Mean (standard dev.)	N = 29 4.28 (3.27)		N = 29 2.26 (2.37)	
Sign-rank test (Promoted vs. Non-promoted)	p<0.001			
Group identity treatment effect (Mann-Whitney test: Group Identity vs. Control)	p=0.323 (promoted in-group worker vs promoted worker without group identity)	p=0.519 (promoted out-group worker vs promoted worker without group identity)	p=0.870 (non-promoted in-group worker vs non-promoted worker without group identity)	p=0.052 (non-promoted out-group worker vs non-promoted worker without group identity)

4.4.2 Distribution of post-promotion effort

We next take a closer look at the effect of group identity on the distribution of exerted effort, controlling for the employee's expectation about being promoted. Table 6 reports the regression analysis of group identity on the effort of promoted workers (Models 1-3) and non-promoted workers (Models 4-6). For the promoted workers, group identity does not affect the decision to provide zero effort (Model 1). However, promoted out-group workers are more likely to provide the maximum effort than promoted workers without group identity (Model 2). Excluding the promoted workers who provide either zero or maximum effort, group identity does not affect the effort (Model 3). For the non-promoted workers, out-group workers are more likely to provide zero effort than workers without group identity (Model 4). Group identity does not affect the decision to provide the maximum effort (Model 5). Again, excluding the non-promoted workers who provide either zero or maximum effort, group identity does not affect the effort levels (Model 6).

Our findings can be summarized as follows:

Observation: Out-group workers are more likely to provide maximum effort if promoted and zero effort if not promoted.

Table 6. Regression analysis of the promoted and non-promoted worker's effort

Model	Promoted workers			Non-promoted workers		
	(1)	(2)	(3)	(4)	(5)	(6)
	Logit	Logit	OLS	Logit	Logit	OLS
Dependent variable	Zero effort	Maximum effort	Effort (excluding zero and maximum effort)	Zero effort	Maximum effort	Effort (excluding zero and maximum effort)
In-group	-0.031	0.019	0.141	0.068	0.024	0.316
	(0.045)	(0.082)	(0.596)	(0.083)	(0.050)	(0.409)
Out-group	-0.002	0.118*	-0.098	0.270***	0.018	0.112
	(0.042)	(0.067)	(0.551)	(0.078)	(0.044)	(0.433)
Expectations of being promoted	0.000	0.002	0.006	0.002**	-0.000	0.001
	(0.001)	(0.001)	(0.009)	(0.001)	(0.001)	(0.006)
Male	0.044	-0.024	0.574	0.069	0.007	-0.215
	(0.041)	(0.052)	(0.449)	(0.062)	(0.030)	(0.319)
Age	-0.002	0.005	-0.004	-0.015	0.005**	0.051
	(0.006)	(0.005)	(0.056)	(0.009)	(0.002)	(0.050)
Constant			3.419**			1.142
			(1.415)			(1.213)
N	180	180	142	180	180	129

Note: In-group is a dummy variable which equals 1 for the in-group worker, and 0 otherwise (out-group or no identity). Out-group is a dummy variable that equals 1 for the out-group worker, and 0 otherwise (in-group or no identity). Coefficients are reported for the models. Standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1%-level, respectively.

4.4.3 The employer's effort expectations

We next analyze whether group identity biases the employer's effort expectations. To this end, we first test hypotheses H2a[e] – H2b[e] and H3a[e] – H3d[e] regarding the employer's expectations, and then compare the effort expectations with the actual effort exerted by the workers to verify whether the employer's expectations are correct or not.

Let us start with hypotheses H2a[e] – H2b[e]. Utilizing incentivized expectations data summarized in Table 7, we find that in line with the reciprocity conjecture, the employers expect the promoted worker to exert higher effort than the non-promoted worker. We test this

conjecture separately for each of the three types of workers in our experiment: in-group, out-group, and workers without group identity. With group identity, the employers expect an average effort of 4.75 from the promoted in-group workers but only 2.41 from the non-promoted in-group workers, with the difference being statistically significant (p=0.001). The same directional result holds for the expectations of the out-group workers' effort. The employers expect that the promoted out-group workers exert an average effort of 4.03 and the non-promoted out-group workers exert an average effort of 1.84. The difference is also statistically significant (p=0.003). When there is no group identity, the employers expect the promoted workers to exert an average effort of 4.43 and the non-promoted workers to exert an average effort of 2.85, with the difference being statistically significant (p=0.001) as well.

Result 2a^e and 2b^e: _The employers expect higher effort from promoted workers than non-promoted workers, irrespective of group identity (or the lack of it)._

We now turn to hypotheses H3a^e – H3d^e. Are the employers' effort expectations affected by group identity? To answer the question, we compare the employers' expectations in the Group Identity treatment and the Control treatment, holding the position constant. We find that the employers' expectations are largely unaffected by the presence of group identity, except for the non-promoted out-group workers whom the employers expect to exert lower effort than the non-promoted workers without group identity. In particular, the average expected effort of promoted in-group workers is equal to 4.75 and the average expected offer of promoted out-group workers is equal to 4.03. Neither of them is significantly different from the average expected effort of promoted workers without group identity, which is equal to 4.43 (p-value = 0.607 and 0.484, respectively).

The average expected effort of non-promoted in-group workers is equal to 2.41 and the average expected offer of non-promoted out-group workers is equal to 1.84. The former is not statistically different while the latter is significantly lower than the average expected effort of non-promoted workers without group identity, which is equal to 2.85 (p-value = 0.236 and 0.013, respectively). Employers thus expect group identity to decrease the post-promotion effort of the non-promoted out-group workers but do not expect any impact on the promoted out-group workers, promoted in-group workers, and non-promoted in-group workers.

Table 7. Summary statistics of the employers' expectations of workers' effort

Treatment	High position (in-group)	High position (out-group)	Low position (in-group)	Low position (out-group)
Group Identity (Mean/ /Standard Dev)	N=61 4.75(2.94)	N=61 4.03(2.92)	N=61 2.41(1.95)	N=61 1.84(1.84)
Sign-rank test (High position vs. Low position)	p=0.001 for in-group workers	p=0.003 for out-group workers		
Control (Mean/Median/SD/N)	N=29 4.43(2.85)		N=29 2.85(1.83)	
Sign-rank test (High position vs. Low position)	p=0.001			
Mann-Whitney test (Group Identity vs Control)	p=0.607 (promoted in-group worker vs promoted worker without group identity)	p=0.484 (promoted out-group worker vs promoted worker without group identity)	p=0.236 (non-promoted in-group worker vs promoted worker without group identity)	p=0.013 (non-promoted out-group worker vs promoted worker without group identity)

Note: The summary statistics include mean/median/standard deviation.

Result 3a^e and 3b^e: _Employers do not expect significantly different effort from promoted in-group workers, out-group workers, and workers without group identity._

Result 3c^e: _Employers do not expect significantly different effort from non-promoted in-group workers and workers without group identity._

Result 3d^e: _Employers expect lower effort from non-promoted out-group workers than non-promoted workers without group identity._

Next, to assess whether group identity biases the employers' expectations, we compare the employers' effort expectations to the actual effort exerted by the workers. In other words, we analyze whether the employers internalize the impact of group identity on workers and

correctly anticipate their post-promotion effort., We compare the actual effort levels presented in Table 5 with the employers' expectations from Table 7, holding group identity (or its absence) and position (promoted vs. non-promoted) constant. In the Control treatment, the employers expect promoted workers without group identity to exert an average effort of 4.43, whereas the actual average effort yields 4.27. The difference is not statistically significant (p=0.719). Non-promoted workers are expected to exert an average effort of 2.85, whereas the average actual effort yields 2.26, which is lower at the 5% significance level (p=0.0496). In the absence of group identity, employers thus fail to recognize the negative impact that not promoting a worker has on exerted effort following the decision.

In the Group Identity treatment, employers expect promoted in-group workers to exert an average effort of 4.75, whereas the actual average effort is 4.86. The difference is statistically insignificant (p=0.946). Promoted out-group workers are expected to exert an average effort of 4.03, while the actual average effort is 4.70, with the difference being statistically insignificant (p=0.341). Non-promoted in-group workers are expected to exert an average effort of 2.41, while the actual average effort is 2.31, with the difference being statistically insignificant (p=0.324). Finally, non-promoted out-group workers are expected to exert an average effort of 1.85, while the actual average effort is 1.89, with the difference again being statistically insignificant (p=0.242).

Failing to reject the null that there are differences between the workers' actual effort and employers' expectations suggests that employers may correctly anticipate ways in which group identity affects the actual effort exerted by workers. We observe biased expectations regarding the effort of non-promoted workers when there is no group identity, but these expectations are corrected with group identity.

Result 4: Group identity does not bias employers' expectations of workers' effort relative to the actual exerted effort.

4.4.4 The employer's promotion decision

Having found no evidence of group identity biasing effort expectations, we now investigate whether group identity biases the employers' promotion decisions through tastes and check whether the bias, if present, reduces the combined effort. Recall that in Experiment 2 we control for the productivity of promoted and non-promoted workers, meaning that a unit of effort is equally valuable for the employer irrespective of who exerts it. A payoff-maximizing employer would thus promote based on the expectations of the combined post-

promotion effort, which is the sum of the effort levels of the promoted and non-promoted worker.[21] The average expected combined effort from promoting an in-group worker yields 6.59 while the average expected combined effort from promoting an out-group worker yields 6.44, with the difference being statistically insignificant (p-value=0.512).[22] Neither of them is statistically significantly different from the average expected combined effort of 7.27 from promoting a worker without group identity (p-value=0.45 and 0.34, respectively).

Table 8 reports employers' promotion decisions between the in-group (X in Control) and out-group (Y) workers and the result from the two-sided Fisher's exact test. In the Group Identity treatment, 54 out of 61 employers promote the in-group worker while only seven promote the out-group worker. In the Control treatment, 12 out of 29 employers promote worker X and 12 promote worker Y, while the remaining five employers are indifferent. The difference in frequencies between the Group Identity and Control treatments is statistically significant (p<0.0001).[23]

Table 8. Employers' promotion choices

Treatment\Promotion choice	In-group worker (X)	Out-group worker (Y)
Group Identity	54	7
Control	12	17
Fisher's exact test (Group Identity vs. Control)	*p<0.0001*	

Our finding is summarized in Result 5. Although employers do not expect a significant difference in the combined effort from promoting the in-group or out-group workers, they are more likely to promote the in-group workers. This result is in line with our Experiment 1

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[21] See Appendix E for the actual exerted combined effort. Workers' expectations of being promoted are presented in Appendix F.

[22] Employers who expect high effort from a worker in one position tend to have high effort expectations in general. Pearson correlations between expected effort levels for different workers and positions range from 0.469 to 0.888. For details see Appendix G.

[23] Recall that in the Control treatment X and Y do not have a particular group identity assigned to them. The results are robust to switching the labels and having 17 workers X and 12 workers Y.

finding that when there is no perceived cost from the preferential treatment of in-group workers, group identity often serves as a tie-breaker regarding who is promoted.

Result 5: Employers are more likely to promote the in-group workers, despite the promotion not increasing the expected combined effort.

Note that the above analysis of the combined effort and subsequent promotion decisions is conducted at the aggregate level using the average behavior of our participants. A more detailed – and also more revealing of the potential group identity bias – analysis can be conducted at the individual level. Due to our use of the strategy method, we can calculate the expected combined effort from promoting the in-group worker and from promoting the out-group worker for each employer (within the Group Identity treatment). Table 9 disaggregates the relationship between employers' promotion decisions and their expectations of the combined post-promotion effort. The bottom row of the table shows that out of the total of 61 employers, 16 expected that promoting the in-group worker would yield higher combined effort than promoting the out-group worker, with a further 33 employers expecting that the combined effort would be equal and 12 expecting that the combined effort would be lower. Out of the 16 employers who thought that promoting the in-group worker would yield higher combined effort, 14 also promoted the in-group worker. Out of 33 employers who expected the same combined effort, 32 promoted the in-group worker, which is consistent with our Experiment 1 results demonstrating taste-based group identity bias. Finally, out of the 12 employers who expected a lower effort, eight still promoted the in-group worker, effectively forgoing larger expected payoffs. This finding is consistent with the above-presented results at the aggregate level and provides further support to our finding of taste-based group identity bias in the promotion decision from Experiment 1.

Result 6: Out of employers who expect a lower combined effort from promoting the in-group worker, two-thirds promote the in-group worker.

Table 9. The relationship between employers' promotion decisions and expected combined post-promotion effort

Actual promotion decision	The difference in expected combined effort when the promoted worker is in-group (vs. out-group)			
	Higher	No difference	Lower	Total
In-group worker	14	32	8	54
Out-group worker	2	1	4	7
Total	16	33	12	61

To test for the employer's in-group bias in the promotion decision at the individual level, we conduct an OLS regression, presented in Table 10, Panel A. The dependent variable is a dummy, whether or not to promote the in-group worker, and the independent variables are three exclusive dummies with only one of them being 1 and the other two being 0 for each of three cases: The employer expects (i) a higher, or (ii) a lower combined effort if the in-group worker is promoted, or (iii) the expected combined effort is the same regardless of whether the in-group or out-group worker is promoted. For example, when the employer expects a higher combined effort if the in-group worker is promoted, the value of the first variable "Higher combined effort if the in-group worker is promoted" is 1 and the values of the other two dummies are 0.

The coefficients on all three dummy variables are positive and statistically significant. When employers expect a higher combined effort if the in-group worker is promoted, they are 87.5% more likely to promote the in-group worker. When employers expect the same combined post-promotion effort, they are 97% more likely to promote the in-group worker. And even when the employers expect a lower combined post-promotion effort if the in-group worker is promoted, they are still 66.7% more likely to promote the in-group worker.

Panel B in Table 10 presents post-estimation Wald tests against theoretical predictions which assume payoff maximization and no group identity bias. When employers expect a higher combined effort from promoting the in-group worker, they should always promote the in-group worker to maximize payoffs. We find that the employers' behavior does not deviate from this theoretical prediction. When employers expect the same combined effort regardless of which worker is promoted, they should promote the in-group worker 50% of the time if they do not have group identity bias. We find that employers promote the in-group worker significantly more often. When employers expect a lower combined effort from promoting the

in-group worker, they should always promote the out-group worker to maximize payoffs. We find that the employers' behavior deviates from this theoretical prediction due to group identity bias.

Table 10. OLS regression of the employer's promotion decision on the expected combined post-promotion effort between promoting the in-group and the out-group worker

Panel A:	OLS regression
	Whether to promote in-group worker
Higher combined effort if in-group worker is promoted	0.875***
	(0.076)
The same combined effort	0.970***
	(0.053)
Lower combined effort if in-group worker is promoted	0.667***
	(0.088)
N	61
adj. R-sq	0.895
Panel B (post-estimation test):	P-values
Higher combined effort if in-group worker is promoted –1	0.1063
The same combined effort –0.5	<0.001
Lower combined effort if in-group worker is promoted	<0.001

4.4.5 Efficiency of promotion

At last, we measure the efficiency loss caused by the group identity biasing the employer's promotion decision. The strategy-method elicitation procedure enables us to do so because it creates a counterfactual scenario that cannot be naturally observed in the workplace. Furthermore, it allows us to calculate the combined effort for all possible promotion outcomes, which we can use to evaluate the efficiency of the employer's promotion decision. We measure

efficiency as the ratio of the achieved combined effort relative to the maximum feasible combined effort. Recall that in each triad (one employer and two workers X and Y in the Control treatment), the workers choose their level of effort if both promoted and not promoted. Let us denote that when promoted, worker X exerts an effort level a, and when non-promoted, an effort level b. Similarly, when promoted, worker Y exerts an effort level c and when non-promoted, an effort level d. Assuming worker X is promoted, the efficiency is 100% if $a+d>=b+c$. In contrast, if $a+d<b+c$, the efficiency is calculated as $(a+d)/(b+c)$, which is less than 100%.

Table 11. The efficiency of the promotion decision

Treatment	Combined effort	Maximum combined effort	Efficiency	N
Control	6.97/8/3.70	7.76/8/4.31	0.93/1/0.16	29
Group Identity	6.79/6/4.55	8.44/8/4.36	0.82/1/0.28	61
if in-group is promoted	6.80/6/4.21	8.56/8.5/4.00	0.81/1/0.09	54
if out-group is promoted	6.71/4/7.11	7.51/7/6.95	0.88/1/0.20	7

Note: The summary statistics include mean/median/standard deviation.

Table 11 presents the summary statistics of the combined effort, maximum combined effort, and promotion efficiency for each of the two treatments. In the Control treatment, the average achieved combined effort is 6.97, compared to the maximum combined effort of 7.76, yielding a 93% efficiency which represents our benchmark.[24] In the Group Identity treatment, the employers on average achieve a combined effort of 6.79, while the maximum combined effort is 8.56. As a result, the employers' promotion decisions only achieve an efficiency of 82%, which is statistically significantly lower than the 93% benchmark ($p=0.026$, Mann-Whitney test). Within the Group Identity treatment, employers who promote the in-group worker achieve an average efficiency of 81%, while those who promote the out-group worker achieve an average efficiency that is 7 percentage points higher. The difference is statistically significant ($p=0.046$).

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[24] An efficiency of 100% is not achieved even in the absence of group identity bias in the Control treatment, because in some cases worker X and worker Y exert different levels of effort. If that happens, the employer's random promotion decision does not maximize the combined effort. Overall, we observe an efficiency loss of 7% in the Control treatment.

Result 7: *Compared to the employers' promotion decisions without group identity, the bias in the promotion decision with group identity, reduces the combined effort.*

4.5 Summary

In Experiment 2, we find that, for non-promoted workers, the out-group workers exert lower effort than workers without group identity, but that the effort from the in-group workers and workers without group identity is not significantly different. For promoted workers, we find no difference in effort between the in-group workers, out-group workers, and workers without group identity. Employers correctly anticipate how group identity affects the actual effort exerted by workers, and hence group identity does not bias effort expectations. Group identity, however, biases the employers' promotion decisions through tastes, and the displayed bias reduces the combined effort of the promoted and non-promoted workers.

5. Concluding discussion

Discrimination in promotion has been considered a serious problem in modern society for decades. This paper contributes to the economics literature on discrimination by analyzing discrimination in promotion. We investigate ways in which group identity affects the tastes of employers and influences promotion decisions, impacting the performance of organizations. In the literature on economic analyses of promotions in internal labor markets, workers' effort incentives before promotion and their productivity after promotion have been the main focus. We contribute to this strand of literature by investigating post-promotion effort exerted not only by promoted workers but also by non-promoted workers (winners and losers), along with post-promotion productivity. To make a distinction between post-promotion productivity and post-promotion effort, we undertake two laboratory experiments.

In both of our experiments, we find evidence that the employers' tastes, affected by group identity, bias their promotion decision, where the bias can negatively affect the performance of an organization. This result leads to our contribution to the economics literature on group identity, where the vast majority of existing studies ask whether group identity mitigates inefficiencies. Our study can be viewed as a valuable addition to a handful of existing studies that explore whether group identity has detrimental effects on economic outcomes.

We find that group identity is not merely an efficiency-neutral tie-breaker regarding whom to promote. In Experiment 1, we find that employers are more likely to promote an in-group worker when the productivity of the in-group worker is the same as the productivity of

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the out-group worker, and also when the in-group worker is observably less productive. In Experiment 2, we find that many employers promote an in-group worker when they expect the same combined effort from promoting an in-group or out-group worker and also when they expect a lower combined effort from promoting an in-group worker. This result arises from our careful attention to the post-promotion effort exerted by non-promoted employees; it would not arise if we studied the effort exerted by promoted employees only. Below we discuss this finding in detail and elaborate on its managerial implications.

Our robust evidence of group identity bias in the promotion decision in multiple environments implies that devices to prevent group identity bias in promotions could help improve the overall productivity of organizations. We point out four basic interventions that companies have at their disposal: (1) obstructing the group identity of promotion candidates from the decision maker; (2) using algorithms to inform the promotion decision; (3) (partially) tying the decision maker's remuneration to the promoted candidate's performance, incentivizing the decision maker to focus more on the skills, abilities, and attitudes of the worker rather than group identity (as demonstrated in our Experiment 1); and (4) by diluting the group identity effect with having a committee (with heterogenous group identities) to reach a promotion decision.

Our finding in Experiment 2 suggests that the impact of promotion decision on non-promoted workers could result in unintended consequences. That is, we find that, for non-promoted workers, the out-group workers exert lower effort than workers without group identity, but that the effort exerted by the in-group workers and workers without group identity is not significantly different. For promoted workers, we find that the effort levels exerted by the in-group workers, out-group workers, and workers without group identity are not significantly different from one another.

We propose an interpretation of this finding that promotion can effectively convert the out-group worker into the in-group worker, in terms of incentives for exerting effort. That is, without being promoted, the out-group worker remains feeling not to be a part of the group, exerting lower effort compared to the non-promoted in-group worker. In contrast, promotion could leave the out-group worker feeling recognized by the employer, shifting the worker's perceived group identity closer to the one shared with the employer. Promoting out-group workers thus has the potential to make them part of the team (akin to Charness, Di Bartolomeo and Papa, 2022) thereby reducing the negative impact of distinct group identities in an organization. This interpretation is supported by the results of our manipulation check

measuring identification with the group, where the identification of out-group workers increases following promotion (see Appendix D).

Given this interpretation, our finding suggests another useful implication for managers when making promotion decisions. Consider, as an example, a manager who has decided to promote an in-group worker purely based on merit (such as high productivity), leaving an out-group worker at a non-promoted position within the organization. Even though the decision is not due to group identity bias, the manager should pay extra attention to the non-promoted out-group worker so that the worker does not feel isolated in the organization. The manager, as an example, could explain in detail the reasoning behind the promotion decision to the non-promoted worker, followed by holding regular meetings with the worker to give feedback on his performance and offer perspectives for the worker to get promoted at the next opportunity.

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Appendix

Appendix A: Subject instructions

Experiment 1

Group Identity Treatment

GENERAL INSTRUCTIONS

No Talking Allowed
Thank you for coming. From now on until the end of the session, any unauthorized communication with other participants is prohibited. If you violate this rule we will have to exclude you from the experiment and from all payments. If you have a question after we finish reading the instructions, please raise your hand and the experimenter will approach you and answer your question in private.

Earnings
In this experiment, you will have an opportunity to earn money. The earnings will be denoted in experimental currency referred to as tokens. Upon completion of the experiment, all tokens will be exchanged into Australian dollars using the following exchange rate: **200 tokens = $1**. Notice that the more tokens you earn, the more dollars you will receive. All earnings will be paid to you in cash at the end of the experiment.

Two Teams
You have been divided randomly into two teams: Team Blue and Team Green. Members of Team Blue are seated in blue rows and members of Team Green are seated in green rows.

Two Tasks
You will be asked to participate in two tasks during the experiment. Task 1 instructions are provided below. Task 2 instructions will be given to you after Task 1 finishes.

TASK 1 INSTRUCTIONS

Three trivia questions will be displayed on your screen. For each correct answer, you will receive **400 tokens**. You can use a computerized team chat to get help from or to provide help to other members of your own team. Messages will be shared only among the members of your own team. You will not be able to see the messages exchanged within the other team. The other team will not be able to see messages exchanged within your team either. Use the field in the middle of the screen to type your messages.

Chat restrictions
1. Remain anonymous. Do not identify yourself and do not provide any information that could be used to identify you, such as gender, age, professional background, etc.
2. Do not use offensive or obscene language.

You will be able to use the chat program for **5 minutes**. After that, the chat will become inactive, but you will still be able to read the messages. Once the chat becomes inactive, you will be able to submit your answers to trivia questions. You will learn the correct answers and your earnings from Task 1 at the end of the session.

Anonymity
You will be randomly matched into triads - groups of three. Each triad will consist of two participants from one team and one participant from the other team. That is, the triad composition will be either Blue-Blue-Green or Green-Green-Blue.

In each triad, one participant will be randomly assigned to be the **Decision Maker**. The two other participants will be **Recipients**.

All decisions are anonymous. No one will learn the identity of the participants he/she is matched with. The experimenters will keep track of all decisions and all earnings by the computer ID number. Because your decision is private, we ask that you do not tell anyone your decision or your earnings either during or after the experiment.

Throughout the experiment, pay attention to the top banner on your screen – it will provide important information.

Decision Maker
On the screen, the Decision Maker will see a table consisting of seven rows, where each row represents a different scenario. In each scenario, the Decision Maker's task is to select either the Green Recipient or the Blue Recipient. The selected Recipient will receive **2200 tokens.** The non-selected Recipient will receive **0 tokens**. For selecting a recipient, the Decision Maker receives earnings that vary with each scenario.

One of the seven scenarios will be randomly selected to determine Task 2 earnings. You will not know in advance which scenario will be selected. It is therefore important that you make each decision carefully in each row, as any one of them might determine your earnings. The task is not repeated, i.e. the Decision Maker makes these seven decisions only once.

Recipients
The Recipients have no decision to make in Task 2. They will see the same seven scenarios as the Decision Maker, however, they cannot influence the Decision Maker's decision in any of them. This means that the Recipients' earnings are determined by the Decision Maker's decision in the randomly selected scenario.

While the Decision Maker is making decisions, the Recipients will be asked to answer a few questions about the experiment. The Decision Maker will be asked similar questions after he/she is done with making decisions.

Questionnaire and Payment of Earnings
After answering the questions about the experiment, your final experimental earnings will be displayed on the screen. Once you have seen your earnings, please click OK. You will then be asked to fill out a short questionnaire. Please remain seated until you are called by the experimenter to come to the room in the back of the lab where you will be paid in private.

Are there any questions?

Control Treatment
GENERAL INSTRUCTIONS

No Talking Allowed
Thank you for coming. From now on until the end of the session, any unauthorized communication with other participants is prohibited. If you violate this rule we will have to exclude you from the experiment and from all payments. If you have a question after we finish reading the instructions, please raise your hand and the experimenter will approach you and answer your question in private.

Earnings

In this experiment, you will have an opportunity to earn money. The earnings will be denoted in experimental currency referred to as tokens. Upon completion of the experiment, all tokens will be exchanged into Australian dollars using the following exchange rate: **200 tokens = $1**. Notice that the more tokens you earn, the more dollars you will receive. All earnings will be paid to you in cash at the end of the experiment.

Two Tasks

You will be asked to participate in two tasks during the experiment. Task 1 instructions are provided below. Task 2 instructions will be given to you after Task 1 finishes.

TASK 1 INSTRUCTIONS

Three trivia questions will be displayed on your screen. For each correct answer, you will receive **400 tokens**. You can use a computerized chat to get help from, or to provide help to other participants. Use the field in the middle of the screen to type your messages.

Chat restrictions
1. Remain anonymous. Do not identify yourself and do not provide any information that could be used to identify you, such as gender, age, professional background, etc.
2. Do not use offensive or obscene language.

You will be able to use the chat program for **5 minutes**. After that, the chat will become inactive, but you will still be able to read the messages. Once the chat becomes inactive, you will be able submit your answers to trivia questions. You will learn the correct answers and your earnings from Task 1 at the end of the session.

TASK 2 INSTRUCTIONS

Anonymity

You will be randomly matched into triads - groups of three. In each triad, one participant will be randomly assigned to be the **Decision Maker**. The two other participants will be **Recipient X** and **Recipient Y.**

All decisions are anonymous. No one will learn the identity of the participants he/she is matched with. The experimenters will keep track of all decisions and all earnings by the computer ID number. Because your decision is private, we ask that you do not tell anyone your decision or your earnings either during or after the experiment.

Decision Maker

On the screen, the Decision Maker will see a table consisting of seven rows, where each row represents a different scenario. In each scenario the Decision Maker's task is to select Recipient X or Recipient Y. The selected Recipient will receive **2200 tokens.** The non-selected Recipient will receive **0 tokens**. For selecting a Recipient, the Decision Maker receives earnings that vary with each scenario. The Decision Maker can also indicate indifference between the two Recipients, in which case the computer will select a Recipient randomly.

One of the seven scenarios will be randomly selected to determine Task 2 earnings. You will not know in advance which scenario will be selected. It is therefore important you make each decision carefully as any one of them might determine your earnings. The task is not repeated, i.e. the Decision Maker makes these seven decisions only once.

Recipients

The Recipients have no decision to make in Task 2. They will see the same seven scenarios as the Decision Maker; however, they cannot influence the Decision Maker's decision in any of them. This means that the Recipients' earnings are determined by the Decision Maker's decision in the randomly selected scenario.

While the Decision Maker is making decisions, the Recipients will be asked to answer a few questions about the experiment. The Decision Maker will be asked similar questions after he/she is done with making decisions.

Questionnaire and Payment of Earnings
After answering the questions about the experiment, your final experimental earnings will be displayed on the screen. Once you have seen your earnings, please click OK. You will then be asked to fill out a short questionnaire. Please keep seated until you are called by the experimenter to come to the room in the back of the lab where you will be paid in private.

Are there any questions?

Experiment 2

Group Identity Treatment

GENERAL INSTRUCTIONS

No Talking Allowed
Thank you for coming. From now on until the end of the session, any unauthorized communication with other participants is prohibited. If you violate this rule we will have to exclude you from the experiment and from all payments. If you have a question after we finish reading the instructions, please raise your hand and the experimenter will approach you and answer your question in private.

Earnings
In this experiment you will have an opportunity to earn money. The earnings are denoted in experimental currency referred to as tokens. Upon the completion of the experiment, all tokens will be exchanged into Australian dollars using the following exchange rate: **5 tokens = $1**. Notice that the more tokens you earn, the more dollars you will receive. All earnings will be paid to you in cash at the end of the experiment.

Two Teams
You have been randomly divided into two teams: Team Blue and Team Green. Members of Team Blue are seated in blue rows and members of Team Green are seated in green rows.

Two Tasks
You will be asked to participate in two tasks during the experiment. Task 1 instructions are provided below. Task 2 instructions will be given to you after Task 1 finishes.

TASK 1 INSTRUCTIONS

Three trivia questions will be displayed on your screen. For each correct answer, you will receive **5 tokens**. You can use a computerized team chat to get help from or to provide help to other members of your own team. Messages will be shared only among the members of your own team. You will not be able to see the messages exchanged within the other team. The other team will not be able to see messages exchanged within your team either. Use the field in the middle of the screen to type your messages.

Chat restrictions
1. Remain anonymous. Do not identify yourself and do not provide any information that could be used to identify you, such as gender, age, professional background, etc.
2. Do not use offensive or obscene language.

You will be able to use the chat program for **5 minutes**. After that, the chat will become inactive, but you will still be able to read the messages. Once the chat becomes inactive, you will be able to submit your answers to trivia questions. You will learn the correct answers and your earnings from Task 1 at the end of the session.

Anonymity

All decisions are anonymous. No one will learn the identity of the participants he/she is matched with. Because your decisions are private, we ask you not to tell anyone your decisions or your earnings either during or after the experiment. Throughout the experiment, please pay attention to the top banner on your screen for important information.

Roles

You will be randomly matched into triads - groups of three. Each triad will consist of two participants from one team and one participant from the other team. That is, the triad composition will be either Blue-Blue-Green or Green-Green-Blue. In each triad, one participant (either Green or Blue) will be randomly assigned to be the **Employer**. The two other participants (one Green and one Blue) will be **Workers**.

Stage 1: The Employer's Decision

The Employer assigns one Worker to the HIGH position. The other Worker is assigned to the LOW position. The wage in the HIGH position is **90 tokens**; the wage in the LOW position is **60 tokens**. The Employer pays these wages from his/her own initial budget of 250 tokens.

Stage 2: The Worker's Decision

Each Worker decides how much effort to provide. Each unit of effort a Worker provides increases the Employer's earnings by **5 tokens**. Effort is costly to the Worker, as specified in the following schedule:

Effort	0	1	2	3	4	5	6	7	8	9	10
Cost of Effort	0	0	1	2	4	6	8	10	12	15	18

The Worker is not yet notified of the Employer's decision. Hence each Worker submits an effort decision for both possible decisions by the Employer:

- If the Worker has been assigned to the HIGH position.
- If the Worker has been assigned to the LOW position.

Note that the Employer's decision will determine which scenario will be relevant. Therefore, please think about your decisions carefully.

Task 2 Earnings

This task is not repeated, each decision is made only once. The earnings are calculated as follows:

- *HIGH position Worker earnings = 90 – Cost of effort in HIGH position scenario*
- *LOW position Worker earnings = 60 – Cost of effort in LOW position scenario*
- *Employer Earnings = 250 – (90 + 60) + 5*(Effort of HIGH position Worker + Effort of LOW position Worker)*

Questionnaire and Payment of Earnings

After Task 2 your final earnings will be displayed on the screen. Once you have seen your earnings, please click OK. You will then be asked to fill out a short questionnaire. Please remain seated until you are called by the experimenter to come to the room at the back of the lab where you will be paid in private.

Are there any questions?

Control Treatment

GENERAL INSTRUCTIONS

No Talking Allowed

Thank you for coming. From now on until the end of the session, any unauthorized communication with other participants is prohibited. If you violate this rule we will have to exclude you from the experiment and

from all payments. If you have a question after we finish reading the instructions, please raise your hand and the experimenter will approach you and answer your question in private.

Earnings

In this experiment you will have an opportunity to earn money. The earnings will be denoted in experimental currency referred to as tokens. Upon the completion of the experiment, all tokens will be exchanged into Australian dollars using the following exchange rate: **5 tokens = $1**. Notice that the more tokens you earn, the more dollars you will receive. All earnings will be paid to you in cash at the end of the experiment.

Two Tasks

You will be asked to participate in two tasks during the experiment. Task 1 instructions are provided below. Task 2 instructions will be given to you after Task 1 finishes.

TASK 1 INSTRUCTIONS

Three trivia questions will be displayed on your screen. For each correct answer, you will receive **5 tokens**. You can use a computerized chat to get help from or to provide help to other participants. Use the field in the middle of the screen to type your messages.

Chat restrictions

3. Remain anonymous. Do not identify yourself and do not provide any information that could be used to identify you, such as gender, age, professional background, etc.
4. Do not use offensive or obscene language.

You will be able to use the chat program for **5 minutes**. After that, the chat will become inactive, but you will still be able to read the messages. Once the chat becomes inactive, you will be able to submit your answers to trivia questions. You will learn the correct answers and your earnings from Task 1 at the end of the session.

TASK 2 INSTRUCTIONS

Anonymity

All decisions are anonymous. No one will learn the identity of the participants he/she is matched with. Because your decisions are private, we ask you not to tell anyone your decisions or your earnings either during or after the experiment. Throughout the experiment, please pay attention to the top banner on your screen for important information.

Roles

You will be randomly matched into triads - groups of three. In each triad, one participant will be randomly assigned to be the **Employer**. The two other participants will be **Workers**.

Stage 1: The Employer's Decision

The Employer assigns one Worker to the HIGH position. The other Worker is assigned to the LOW position. The wage in the HIGH position is **90 tokens**; the wage in the LOW position is **60 tokens**. The Employer pays these wages from his/her own initial budget of 250 tokens.

Stage 2: The Worker's Decision

Each Worker decides how much effort to provide. Each unit of effort a Worker provides increases the Employer's earnings by **5 tokens**. Effort is costly to the Worker, as specified in the following schedule:

Effort	0	1	2	3	4	5	6	7	8	9	10
Cost of Effort	0	0	1	2	4	6	8	10	12	15	18

The Worker is not yet notified of the Employer's decision. Hence each Worker submits an effort decision for both possible decisions by the Employer:

- If the Worker has been assigned to the HIGH position.
- If the Worker has been assigned to the LOW position.

Note that the Employer's decision will determine which scenario will be relevant. Therefore, please think about your decisions carefully.

Task 2 Earnings
This task is not repeated, each decision is made only once. The earnings are calculated as follows:
- *HIGH position Worker earnings = 90 – Cost of effort in HIGH position scenario*
- *LOW position Worker earnings = 60 – Cost of effort in LOW position scenario*
- *Employer Earnings = 250 – (90 + 60) + 5*(Effort of HIGH position Worker + Effort of LOW position Worker)*

Questionnaire and Payment of Earnings
After Task 2 your final earnings will be displayed on the screen. Once you have seen your earnings, please click OK. You will then be asked to fill out a short questionnaire. Please remain seated until you are called by the experimenter to come to the room at the back of the lab where you will be paid in private.

Are there any questions?

Appendix B: Trivia question bank

(Here, the first option is always correct. In the experiment, the options were presented in a random order.)

How tall is the Eiffel Tower in Paris?
- 324 meters
- 46 meters
- 215 meters

What scale is used to measure the spiciness of chili peppers?
- Scoville scale
- Beaufort scale
- Burns scale

In what year was the first Apple computer released?
- 1976
- 1989
- 1991

How many US states border the Pacific Ocean?
- Five
- Four
- Three

What was the first toy to ever be advertised on television?
- Mr. Potato Head
- G.I. Joe
- Barbie

Which actress won the most Oscar awards?
- Katharine Hepburn
- Audrey Hepburn
- Elizabeth Taylor

Which country lies on the border between Spain and France?
- Andorra
- Monaco
- Portugal

In what year was the U.S. constitution written?
- 1787
- 1817
- 1847

How many holes are there in a full round of golf?
- 18
- 21
- 23

Guinness beer was first brewed in which country?
- Ireland
- Germany
- United Kingdom

Yerevan is the capital of which country?
- Armenia
- Kazakhstan
- Yerevan is not a capital city

What do golfers shout to warn other golfers when they hit an errant shot?
- Fore!
- Timber!
- Duck and cover!

Where was Freddie Mercury, the lead singer of Queen, born?
- Zanzibar
- Liverpool
- Manchester

How many paintings did Vincent Van Gogh sell during his lifetime?
- One
- Zero
- Three

Which artist is famous for his painting "Persistence of Memory"?
- Salvador Dali
- Auguste Rodin
- Pablo Picasso

Appendix C: Beliefs elicitation

Experiment 1

Each worker, seeing the same multiple price list as the one the employer saw in Stage 2, indicates the perceived probability of himself being selected in each scenario using a slider that ranges from 0 ("I will be selected") to 100 ("The other worker will be selected"). The employer is asked to guess the answers of both matched workers. The elicitation of the workers' expectations and the employer's second-order beliefs is incentivized using a quadratic scoring rule (Murphy and Winkler, 1970; Schlag and Tremewan, 2021; Sonnemans and Offerman, 2001). The employer's and workers' earnings (π_{E^e} and π_{W^e}, respectively) in Stage 3 are calculated as follows:

$$\pi_{E^e} = 800 - 2 * error^2$$

$$\pi_{W^e} = 1600 - 0.16 * error^2$$

For the employer, the error is measured by the difference between each worker's reported expectations about the chance of being selected (in %) and the employer's second-order belief. For each worker, the error is measured by the distance of the worker's reported expectation (in %) from the employer's actual promotion decision.[25] To aid comprehension, we provide a slider so that participants can try out different scenarios while the resulting earnings are automatically updated in a displayed table. The maximum attainable earnings in Stage 3 are 1600 tokens in each role.

The employers' second-order beliefs and the promotion decision
Do the employers' second-order beliefs (about workers' expectations to be promoted) drive the promotion decision? Table 12 reports the results of the rank-ordered logit models of the employers' promotion decisions in which we test the role of the employer's second-order beliefs. The dependent variable Promotion corresponds to the three possible choices: 1 represents promoting the in-group worker (worker X in the Control treatment), 0.5 represents the employer being indifferent, and 0 represents promoting the out-group worker (worker Y in the Control treatment). The independent variables include the seven scenarios and their interactions with the Group Identity treatment, as well as controls for participants' gender and age. Model (2) controls for the employers' second-order beliefs which are absent in Model (1). The reported coefficients indicate the marginal change in the log-odds of choosing one level higher (i.e., from 0 to 0.5 and from 0.5 to 1) in the Promotion decision, holding all other variables constant.

The results of Model (1) confirm the results of the non-parametric tests. Relative productivity is the driver of the promotion decision. For Scenarios 1-3 where the productivity of the in-group candidate (X) is higher, most of the employers choose to promote the in-group (X) worker and there is no statistically significant difference in frequencies of promotion decisions

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[25] If a worker submits an expectation of 65% and is then selected, the error is 100-65=35. If he is not selected, the error is 65.

between treatments. In Scenario 4, where the candidates have the same productivity, the employers exhibit statistically significant group identity bias as reflected in the interaction term coefficient of Identity and 4*Scenario. As the productivity of worker Y exceeds that of worker X (Scenarios 5 – 7) in the Control treatment, the employers are more likely to promote worker Y. In Scenarios 5 and 6 in the Group Identity treatment, the employers promote the in-group worker, with the group identity bias being weakly statistically significant in Scenario 6. As the productivity differential in the Group Identity treatment becomes large (Scenario 7), the employers are more likely to promote the more productive out-group worker.

When we include the employers' second-order beliefs in the regression, we find that this variable is statistically significant but none of the above variables remain statistically significant (see Model (2)). The result indicates that the employers' second-order beliefs capture the changes in the promotion decision due to the productivity differential and group identity bias.

Table 12. Ordered logit of the promotion decision

Model	(1) Ordered logit	(2) Ordered logit
Dependent variable	Promotion	Promotion
2.Scenario	-0.45	-0.23
	(0.79)	(0.81)
3.Scenario	-0.42	0.26
	(0.78)	(0.79)
4.Scenario	-3.49***	-1.07
	(0.72)	(0.82)
5.Scenario	-5.99***	-1.61
	(1.14)	(1.38)
6.Scenario	-6.27***	-1.38
	(1.29)	(1.43)
7.Scenario	-6.75***	-2.17
	(1.22)	(1.54)
Identity*1.Scenario	-0.90	-0.20
	(0.94)	(0.89)
Identity*2.Scenario	-0.74	-0.05
	(0.82)	(0.84)
Identity*3.Scenario	-0.69	-0.28
	(0.78)	(0.88)
Identity*4.Scenario	0.76**	0.51
	(0.31)	(0.33)
Identity*5.Scenario	0.67	-0.09
	(0.73)	(0.82)
Identity*6.Scenario	1.49*	1.02
	(0.76)	(0.78)
Identity*7.Scenario	0.83	0.28
	(0.90)	(1.15)
Employers' second-order beliefs		0.05***
		(0.01)
Male	0.18	0.01
	(0.22)	(0.23)
Age	-0.01	-0.02
	(0.01)	(0.02)
N	504	504

Note: The dependent variable Promotion = 1 if the employer promotes the in-group worker, 0.5 if the employer chooses the indifferent option, and 0 if the employer promotes the out-group worker, i*Scenario (where i=2-7) are dummy variables representing Scenarios 2-7, respectively. Identity is a dummy variable, the value of which equals 1 for the Group Identity treatment and 0 for the Control treatment. Standard errors, clustered at individual level, are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1%-level, respectively.

Experiment 2

Workers use a slider to submit their promotion expectations, i.e., the percentage chance to be selected for the High position. The elicitation is incentivized using the quadratic scoring rule:

$$\pi_W e = 20 - 0.002 * error^2$$

where $\pi_W{}^e$ represents a worker's earnings from the elicitation and *error* is measured by the percentage point distance of the submitted expectation from the actual decision taken by the employer. A worker earns 20 tokens if his expectation is completely correct. The employer is asked about his expectations of effort levels provided by the workers. For each combination of in-group/out-group workers in the High/Low position, the employer guesses the average effort levels the workers chose to exert in the experimental session. [26] The elicitation is also incentivized using the quadratic scoring rule:

$$\pi_E e = 5 - error^2$$

where $\pi_E{}^e$ represents an employer's earnings from the elicitation and *error* is the distance of the employer's expectation from the actual average effort level provided in the respective worker position combination in the experimental session. The employer earns 5 tokens for a completely correct guess. A simple table displays earnings for a number of possible error values, to help the employer comprehend the parameterization.

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[26] We elicit the employer's beliefs about the average effort levels rather that the effort levels of the workers the employer is matched with. If, for example, the employer believes that half of the promoted out-group workers will submit effort level of 0 and half will submit effort level of 10, he can submit an estimate of 5 and be correct. Consider an alternative in which beliefs about the specific workers the employer is matched with are elicited. Now the employer has to either make a gamble between submitting 0 or 10, or has to select 5 which he believes is partially incorrect.

Appendix D: Group identity manipulation check

We use the 7-point Inclusion of In-group in the Self Scale (Aron et al., 1992; Tropp and Wright, 2001), henceforth IGIS, to measure the effectiveness of our group identity manipulation.

In Experiment 1, the average IGIS in the Group Identity treatment (M = 4.38, SD=1.52) is higher than the average IGIS in the Control treatment (M = 3.40, SD = 1.70), with the difference being statistically significant (two-sided Mann-Whitney test, p<0.001). For the group identity treatment, we also elicit the score of their Inclusion of the Out-groups, henceforth OGIS. The average OGIS in the Group Identity treatment is (M = 2.02, SD = 1.42) and is statistically significantly lower than the IGIS counterparts (Wilcoxon signed rank test, p<0.001). All the results indicate that our group identity manipulations are successful.

In Experiment 2, the average IGIS in the Group Identity treatment (M = 4.70, SD=1.71) is higher than the average IGIS in the Control treatment (M = 3.47, SD = 1.56), with the differences being statistically significant (two-sided Mann-Whitney test, p<0.001). We also find In-group in the Self Scale for promoted in-group workers are higher (M = 5.59, SD = 1.89) and non-promoted in-group workers (M = 3, SD =2.65) after the promotion decision is revealed, with the difference being statistically significant (two-sided Mann-Whitney test, p=0.008). The identification score with the other group (Out-group in the Self Scale) for out-group workers is higher if promoted (M = 3.86, SD = 2.12) than if not promoted (M = 2.02, SD = 1.74), with the difference being statistically significant (two-sided Mann-Whitney test, p=0.025).

Appendix E: Combined post-promotion effort (Experiment 2)

We do not find any statistical significance difference in the combined post-promotion effort between workers without group identity, and in-group/out-group workers.

Table 13. Combined post-promotion effort

Treatment\Positions	In-group worker promoted	Out-group worker promoted
Group Identity	7.18/7/5.22	6.59/5/5.41
Control	6.53/5.5/5.01	
Mann-Whitney test (Group Identity vs Control)	0.59	0.87

Note: The numbers in each cell respectively refer to mean/median/standard deviation.

Appendix F: Workers' expectations of being promoted (Experiment 2)

Compared to workers without group identity, in-group workers expect to be more likely promoted, with the difference being statistically significant (p=<0.001). Similarly, compared to workers without group identity, the out-group workers expect less likely to be promoted. The difference in expectations is statistically significant (p=0.003).

Table 14. Workers' expectations of being promoted

Treatment\Positions	In-group worker	Out-group worker	Worker without group identity (Control)
Expectations	76.28/79/23.73	37.11/48/30.96	52.35/50/24.32
Mann-Whitney test (Group Identity vs Control)	<0.001	=0.003	

Note: The numbers in each cell refer to mean/median/standard deviation.

Appendix G: Correlation between employers' expected effort from promoted and non-promoted workers

Table 15. Pearson correlations between the employers' expected effort levels from workers in the promoted and non-promoted positions (Experiment 2)

	High position (in-group worker)	Low position (in-group worker)	High position (out-group worker)	Low position (in-group worker)
High position (in-group worker)	1.000			
Low position (in-group worker)	0.628	1.000		
High position (out-group worker)	0.888	0.496	1.000	
Low position (out-group worker)	0.575	0.674	0.548	1.000

Note: N = 61 employers.