BRIBERY: BEHAVIORAL DRIVERS OF DISTORTED DECISIONS

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Abstract
We experimentally investigate behavioral drivers of bribery, focusing on the role of self-interest, reciprocity, and moral costs associated with distorting judgment. In our laboratory experiment, two participants compete for a prize; a referee picks the winner. Participants can bribe the referee. When the referee can keep only the winner's bribe, bribes distort her judgment. When the referee keeps the bribes regardless of the winner, bribes no longer influence her decision. An experiment in an Indian market confirms these results. These findings imply that our participants are influenced by bribes out of self-interest, and not because of a desire to reciprocate. Further evidence shows that self-interest guides decisions to a greater extent when referees have scope for avoiding the moral costs associated with distorting judgment. As a result, limiting referees' ability to form self-serving evaluations can significantly reduce the effectiveness of bribes. (JEL: D73, C91, K42)

1. Introduction

Bribery affects economic activities around the world. Because it is illegal in most places, getting good empirical data about these activities is difficult. However, the existing data show bribery is widespread. The World Bank estimates that $1 trillion exchanges hands in bribes annually (Kaufmann 2005), and many companies report

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having to pay bribes to win business—from 15% to 20% in industrialized countries, to 40% in China, Russia, and Mexico (Transparency International 2011). Bribes range from billions of dollars in international arms deals, to paying a few dollars to a police person to avoid a ticket for a minor traffic violation. Some cases do not include money, but rather nonmonetary gifts and services, such as sending gifts to teachers, or offering free tickets or trips to physicians (e.g., Maréchal and Thöni 2016).

In this paper we focus on bribe recipients, studying the behavioral motives that drive them to distort their judgment in response to bribes. This type of distortion is an important feature of bribery, and occurs whenever decision-makers pursue private gain and use bribes rather than more desirable criteria such as merit, performance, or quality to allocate public resources. As a result, public resources may go to the more corrupt people, not necessarily the most talented ones (Pareto 1896; Goldsmith 1999; Del Monte and Papagni 2001), with detrimental effects on efficiency (see, e.g., Mauro 1995; Bertrand et al. 2007; or see Olken and Pande 2012 for a review). Such outcomes are particularly prevalent in environments where decision makers rely on subjective criteria (e.g., Klitgaard 1988; Tanzi 1998). Consider, for example, government procurement, which often involves "best value" contracting decisions, where procurement officers can make subjective selections rather than having to rely on objective criteria (Burguet and Che 2004; Ware et al. 2007; Gordon 2014). Or take the case of government hiring. When the demand for positions substantially exceeds the supply, hiring committees can discretionarily select one among several qualified candidates (Theobald 1990). These environments are particularly susceptible to bribery because discretionary criteria provide decision-makers with scope for justifying corrupt behavior, both to others and to themselves.

To reduce bribery it is important to understand the motives that drive it. In other words, why do bribes "work?" If one of the sides in a bribery case does not fulfill his part, the other side cannot take him to court or use traditional enforcement mechanisms. What prevents one, for example, from taking a payment but then not providing the good? If receiving the bribe is credibly contingent on the briber's success (e.g., if bribes are conditional on winning a contest, or in the case of repeated interactions), traditional economic models with selfish agents can explain why bribes affect behavior. In other one-shot cases in which receiving a bribe is not contingent on delivering the desired outcome, traditional economic assumptions may not be sufficient. In these cases, social preferences may be able to explain the success of bribery. People might be engaged in reciprocal behavior in which one side gives a "gift" and the other reciprocates (Akerlof 1982; Cialdini 1993; Rabin 1993; Fehr and Gächter 2000; Malmendier and Schmidt 2017). At the same time, for some individuals distorting decisions in response to bribes may come with psychological or moral costs. These costs may encourage individuals to behave honestly, thereby reducing their tendency to reciprocate and/or pursue their own financial interest (see, e.g., Gneezy 2005; Dreber and Johannesson 2008; Sutter 2009; Banerjee et al. 2012; Abeler et al. 2016).

In order to understand the role of these behavioral drivers, we introduce a bribery game designed to capture distortions of subjective judgment. In this game, two participants ("the workers") compete on a task. A third participant, the referee, then

chooses the winner, who gets a prize. Apart from working on the task, the two workers can also choose whether and how much to bribe to the referee. We use this basic design to investigate the behavioral motives through which bribes distort decision-making, focusing on the role of greed (defined here as self-interest profit-maximization, with no cost of immoral behavior), reciprocity, and moral costs. For this purpose, we vary whether the referee can keep both bribes or only the winner's bribe. This manipulation allows us to distinguish between reciprocity and greed, because whenever the referee is able to keep both bribes regardless of her decision, greed will not influence her choice and only social preferences can drive behavior.

The real-effort task we use in the experiment is one in which the rightful winner is determined subjectively, which mimics situations in which decision makers have discretionary power and rely on subjective criteria to allocate resources. Subjective criteria and discretionary power provide scope for self-serving evaluations, making it possible for referees to argue (to themselves) that the worker who sent a higher bribe also performed best on the task, thereby allowing them to avoid any moral costs associated with distorting judgment. We study the role of moral costs in additional treatments that decrease the scope for self-serving evaluations by using a more objective task, and by only revealing the bribes when referees are halfway through their evaluation. These treatments allow us to assess whether increasing moral costs in this way affects the impact of bribes. This approach builds on the literature on motivated beliefs and self-serving biases that arise in the presence of ambiguity (Kunda 1990; Babcock et al. 1995; Konow 2000; Dana et al. 2007; Haisley and Weber 2010; Bénabou and Tirole 2016; Exley 2016) and illustrates their relevance in the domain of corruption.

In addition to the laboratory experiments, we replicated our baseline treatments in an extra-laboratory experiment run in a market in Shillong, India. This experiment allows us to investigate whether our lab findings generalize to an environment and population that may be more regularly exposed to bribery than UC San Diego students. The results of this experiment confirm the main findings obtained in the laboratory experiments.

Overall, our results show that in our game the mechanism through which bribes "work" is mostly greed and not reciprocity. However, we also find that self-interested behavior is more likely to emerge when individuals are able to minimize any moral costs by engaging in self-serving evaluations. This suggests that greed may have both a direct effect on choices and an indirect effect, by changing the way people evaluate outcomes. Our results suggest that policy interventions that focus on increasing the moral costs of distortion and limit the scope for self-serving biases, for example, by requiring evaluators to follow objective evaluation criteria, may provide a successful way to reduce the effectiveness of bribes.

We are not the first to study bribery using laboratory experiments: the existing experimental literature examines different elements of bribing behavior in settings that do not involve distortion, from the effect of asymmetric liability (Abbink et al. 2014) to culture (Cameron et al. 2009; Barr and Serra 2010) and the influence of wages (Armantier and Boly 2013; van Veldhuizen 2013), see Abbink and Serra (2012) for a comprehensive survey of these experiments. More closely related to our design is

the paper by Armantier and Boly (2013), who study how the corruptibility of graders hired to evaluate the number of mistakes in a spelling exam varies with the size of the bribe, the grader's wage and the likelihood of being monitored. All evaluators in their study received a bribe from someone whose score (20 mistakes) was not good enough to meet the pass threshold of 15 mistakes. Note that the spelling task leaves little scope for self-serving evaluations. Armantier and Boly (2013) find that evaluators who receive higher wages or who are offered smaller bribes are less likely to be corrupt, whereas monitoring has no effect. Whereas these previous studies focus on how standard economic interventions affect corruptibility, we connect the literature on corruption to a broader behavioral economics literature investigating the role of social preferences in labor markets, the psychological costs of deception, and the role of motivated beliefs and show their relevance in the domain of corruption.

The remainder of the paper is organized as follows. Section 2 explains the bribery game and the experimental design and Section 3 presents the results. Section 4 reports the design and results of the experiment in India. Section 5 concludes.

2. Experimental Design

2.1. The Bribery Game

Our bribery game involves three players: two workers and a referee. The workers compete against each other on a real-effort task and the referee is asked to determine a winner. The worker who wins gets a prize of p, and the other worker receives nothing. Workers can send a bribe ($b_i \in [0, \frac{1}{2}p]$) to the referee, with only integer amounts allowed.

Our main identification relies on two versions of the basic game. In treatment KeepWinner, referees keep the bribe of the winning worker; the other worker's bribe is returned. The referee's monetary payoff maximizing strategy is then to choose the worker who submits the higher bribe; in response the worker's payoff maximizing strategy is to bribe the maximum, $\frac{1}{2}p$. In the second treatment we study ("KeepBoth"), the referee keeps both bribes irrespective of her choice of winner. A monetary payoff maximizing referee will then be financially indifferent between both workers, irrespective of the bribes. The workers' payoff maximizing strategy depends on their belief regarding how the referee will reward bribes. For a detailed analysis of worker behavior and equilibrium predictions, see Online Appendix B.10. This basic game allows us to study whether bribes induce referees to distort the true ranking between workers, resulting in an allocation of the prize based on bribes rather than performance. Note that to focus on answering our main research questions and isolate the motives that drive distortion, we do not introduce additional elements often associated with bribery, such as monitoring, punishment, and third-party externalities.

Task. Our experiment involves a real-effort task that workers complete before submitting their bribes. We chose a task that involves creativity and for which the

evaluation is not fully objective but depends partly on the referee's subjective taste. In particular, we asked workers to write a joke either about economists (round 1) or psychologists (round 2). Evaluating jokes is a subjective task because humor is at least partially a matter of taste, so that for relatively similar jokes, different referees may have different opinions about which joke is the better one. For an overview of some of the jokes written by participants see Online Appendix D.

Procedures. We conducted the experiment at University of California San Diego with a total of 573 participants. Participants were recruited using standard laboratory procedures via an online experimental registration system. Each session consisted of six participants, who were randomly assigned to one of two roles (4 workers and 2 referees). To make sure we had enough participants, we invited 10 participants to the laboratory for each session, randomly selected six of them, and dismissed the extra participants after paying them a $5 show-up fee. All instructions are available in Online Appendix C; additional experimental materials and the experimental protocol are available from the journal's website.

The workers (called participants A and B in the experiment) sat in the main laboratory, whereas the two referees sat in separate rooms next to the main lab. On their desks, workers had an envelope with their $10 show-up fee in $1 bills; referees received a $5 show-up fee. The information about the other participants' show-up fees was made common knowledge. After reading the instructions and completing three attention questions, workers learned the topic of the jokes ("economists") and had 10 min to write a joke. Meanwhile, referees learned about their task in the experiment (judging the jokes). After completing their task, workers stated their expected likelihood of having a better joke than their opponent ("What do you believe is the probability that you will have a better joke than your opponent?"). The experimenter then printed the four jokes and returned each joke to its respective worker. Workers did not learn the jokes of the other workers in the experiment.

Both workers and referees then received a second set of instructions, which notified them of the opportunity for workers to send money to the referee. In particular, workers had to put the printed copy of their joke in a large envelope labeled with their participation ID, and had the opportunity to add up to $5 of their show-up fee to the envelope. An experimenter collected the four envelopes, and delivered them to their respective referee after privately recording their monetary content. Referees had 5 min to determine the winner by placing a "winner card" and a "loser card" in the winner's and loser's envelope, respectively. Depending on the treatment, some referees were instructed to return the loser's bribe by putting it back in the envelope. Regardless of the treatment, referees were also asked to rate the quality of the workers' jokes on a scale of 0–10 on a separate form. After 5 min, the referees returned the envelopes to the experimenter, who then privately recorded their decisions.

The experiment consisted of two rounds with the same matching of participants. To prevent referees from reciprocating the largest bribe in round 1 for strategic reasons, no feedback was provided between rounds. The procedure for round 2 was identical to that of round 1, apart from the topic of the joke ("psychologists"). After the second

round, both workers and referees were asked to complete a survey of basic demographic information, after which workers got back their two envelopes with the jokes, winner or loser cards, and any money returned by the referee. Workers then received an additional $10 prize for each winner card, and they and the referees could leave the laboratory. Hence, referees earned their $5 show-up fee plus any bribes kept, whereas workers earned their $10 show-up fee plus any prizes received minus any bribes kept by the referee.

2.2. The Experimental Treatments

We conducted six treatments to help us shed light on the behavioral drivers of distorted decisions, which are summarized in Table 1.

Greed, Reciprocity, and Moral Costs. Our identification of the role of greed, reciprocity and moral costs relies on the two versions of the basic game described previously. In treatment KeepWinner, the referee was instructed to keep the money sent by the winning worker and had to return the loser's money by putting it back in the loser's envelope. In treatment KeepBoth, the referee kept all the money sent by both workers.

Comparing behavior in treatment KeepWinner with behavior in treatment KeepBoth allows us to test whether reciprocity or greed distort judgment. In treatment KeepWinner, a selfish payoff-maximizing referee would base her decision solely on the size of the bribes, and choose the worker who sent the higher bribe. Similarly, a reciprocal referee would want to reciprocate the worker who was nicer to her, by also choosing the worker who sent the higher bribe. Note that when we refer to reciprocity and gift exchange in the paper, we refer exclusively to nonstrategic motives driven by social preferences, and not to repeated game considerations that include profit

TABLE 1. The experimental treatments.

	Which bribe does the referee keep?	Task	Participants	Ref. show-up fee	Timing of the bribe
KeepWinner					
Baseline	Only winner's	Jokes	120	$5	Immediate
Reject	Chooses whether to Keep winner's	Jokes	30	$5	Immediate
KeepBoth					
Baseline	Both	Jokes	120	$5	Immediate
Reject	Chooses whether to keep both	Jokes	30	$5	Immediate
HighWage	Chooses whether to keep winner's	Jokes	60	$20	Immediate
NoTask	Both	No	30	$5	–
Objective	Only winner's	Objective	93	$5	Immediate
KeepWinnerDelayed	Only winner's	Jokes	90	$5	After 3 min

maximization motives. In treatment KeepBoth, the referee's choice of winner does not affect her payment. Hence, a selfish payoff-maximizing referee would be indifferent between workers. By contrast, a reciprocal referee would still reward the higher bribe even when doing so does not affect her payoff. If reciprocity drives behavior, the distortionary effects of bribery will therefore be similar in both treatments. If greed drives behavior, referees will distort their judgment in treatment KeepWinner, but in general not in treatment KeepBoth. If referees also have moral costs associated with distorting their judgment, these costs may outweigh greed and/or reciprocity concerns, limiting distortion of judgment in one or both treatments. By comparing these two treatments, we can therefore rank the importance of greed, reciprocity, and moral costs.

We ran two different versions of the KeepWinner and KeepBoth treatments, varying only in whether referees were allowed to reject the bribes. Not allowing referees to reject the bribes allows us to cleanly study the effect of bribery on decision-making. However, this is a simplification, since in many real-world situations referees also have the option to reject bribes by returning or discarding them. This may be relevant in situations where honest behavior implies choosing a worker but rejecting his bribe. To allow us to ensure that this simplification did not affect our results, we ran 5 sessions (30 participants) of both the KeepWinner and KeepBoth treatment where referees were allowed to reject both bribes. Specifically, referees in these cases were told that they also had the option to return both bribes to the workers by putting them back into their respective envelopes.

Note that a feature of this experimental design is that although workers are randomly paired within sessions, bribes are not determined at random. We deliberately allowed workers to choose their own bribes, because for reciprocity to matter it is crucial that the worker's bribe was intentional. However, to analyze referees' behavior and make treatment comparisons, it is important that referees in the two treatments face similar combinations of bribes. That is, the distribution of the difference between the bribes the referees receive from the two workers must be similar across both treatments. We will explore whether this is the case in the results section, where we also discuss how other possible differences in bribing behavior across the two treatments may affect referees' decisions.

Inequity Aversion. In both treatments described previously the referee starts with less money than the workers ($5 vs. $10). Accepting the higher bribe therefore *decreases* inequity by making the referee's income more similar to both the winner's income and the loser's income. Hence, referees may distort judgment not because of greed or reciprocity, but rather out of some sort of inequality preferences (see, e.g., Fehr and Schmidt 1999; Bolton and Ockenfels 2000). To investigate the role of inequity aversion in our experiment, we ran an additional treatment (treatment HighWage) that is similar to treatment KeepWinner, except that referees receive a higher show-up fee ($20 instead of $5). This implies that the referee now starts the experiment with more money than the workers ($20 vs. $10). In this treatment, accepting the higher bribe will now therefore *increase* inequity. Thus, inequity aversion would predict referees

would be less likely to let the higher bribe win in treatment HighWage than in treatment KeepWinner. In this treatment, we allowed referees to reject bribes in all sessions, in order to give them the possibility of decreasing inequity by choosing a winner without keeping either of the two bribes.

Moral Costs and the Role of Self-Serving Evaluations. We ran three treatments that allow us to examine the importance of moral costs, and explore how their importance is affected by the presence of a scope for self-serving evaluations. These treatments allow us to investigate whether bribes also have an indirect effect by changing the way referees evaluate outcomes.

First, we eliminate moral costs by investigating referees' behavior in a treatment (Treatment NoTask) that is identical to treatment KeepBoth, except that workers no longer compete on a task. In this treatment, choosing the higher bribe does not require the referee to distort judgment, as there is no better performer. Hence, choosing the higher bribe in this context does not generate moral costs. By comparing this treatment to treatment KeepBoth, we can therefore test whether moral costs of distortion are important, and whether in the absence of such distortion, reciprocity can lead referees to award the prize to the worker with the higher bribe. This treatment is more closely related to existing bribery games in the literature (e.g., Abbink et al. 2002) that do not capture the distortionary effect of bribes on resource allocations that our design focuses on.

In two additional treatments, we increase the moral costs of distortion by limiting the referee's ability to form motivated beliefs about workers' performance. In treatments KeepWinner and KeepBoth, referees had to rank two participants based on their performance on a subjective task. In such situations moral costs may be relatively low because the subjective nature of judgment leaves some ambiguity over who is the best performer, allowing referees to engage in self-serving evaluations as a way to justify corrupt behavior. In these two additional treatments we therefore increase the moral costs by limiting this type of ambiguity, thereby reducing the scope for self-serving evaluations.

Treatment Objective involves a variation of treatment KeepWinner in which workers compete on a more objective task. In particular, workers perform a word-identification task where their score equals the number of words correctly identified. In order to not trivialize the referee's task, each referee receives a graphical representation of the number of words correctly identified by the workers (for more details, see Online Appendix C.1). This allows referees, with a little effort, to objectively determine the best performer among the two workers, removing the ambiguity of the subjective task, and greatly reducing the scope for self-serving evaluations. As a result, we expect that in this treatment the moral costs of distortion will increase, limiting the effectiveness of bribes.[1]

1. One referee in this treatment misunderstood the instructions and accidentally sent back both bribes in the first round. We removed this observation from the data, and ran one additional session to reach the planned number of observations.

In treatment KeepWinnerDelayed we increase the moral costs of distortion in a different way, without changing the nature of the task. In particular, this treatment is a variation of treatment KeepWinner in which referees only receive the workers' bribes 3 min after receiving their jokes. In practice, workers were instructed to put the joke and the money in two separate envelopes. After referees had 3 min to evaluate the task, the experimenter delivered the envelope with the money, leaving the referee with 2 more min to determine the winner. This manipulation, which builds on work on self-serving biases in negotiations (Babcock et al. 1995) and on work on the role of self-deception in advice (Gneezy et al. 2017), gives referees a chance to form an unbiased evaluation of quality before finding out about the bribes, making it more difficult for referees to persuade themselves that the worker with the highest bribe also wrote the best joke. Similar to treatment Objective, we therefore expect this treatment to increase the moral costs of distortion, limiting the effect of bribes. Referees were unable to reject bribes in the three treatments discussed in this section.

2.3. Joke Quality

After the experiment was completed, we organized additional sessions in which participants from the same subject pool, who had not previously participated in the experiment, evaluated the quality of several pairs of jokes. Each pair of jokes was evaluated by an average of 22.5 independent raters. For each pair of jokes, the raters had to evaluate the quality of each joke (on a scale from 0 to 10) and had to determine which joke was funnier. Raters were shown the same pairs of jokes the referees evaluated during the experiment, without being informed about the bribes sent by the workers. This procedure provides us with a more objective measure of joke quality, which is not biased by the presence of bribery. Each independent rater only evaluated up to six pairs of jokes, chosen at random by an electronic randomizer among all the possible pairs of jokes. The full instructions are in Online Appendix C.4.

3. Results

Table 2 presents some descriptive statistics on our sample, and shows that the treatments are balanced with respect to demographics. Joke quality and confidence levels are also not statistically different between treatments and rounds (Bonferroni or Holm–Bonferroni correction for multiple hypothesis testing). Before moving to the main results, we note that allowing referees to reject bribes did not affect referees' behavior or the behavior of workers in a significant way. As we show in Online Appendix B.1, referees faced similar pairs of jokes and bribes and behaved similarly in both versions of the KeepWinner and KeepBoth treatments. In addition, bribes were only rejected in 2 out of 20 (10%) cases in each treatment. In what follows we will therefore analyze the pooled data from the baseline and reject sessions for both treatments.

In the remainder of this section, we will use both parametric and nonparametric tests to test for differences between treatments. Whenever we analyze worker behavior,

TABLE 2. Descriptive statistics.

		KeepWinner KW		KeepBoth					
	Overall	Base	Reject	Base	Reject	High Wage	No Task	Objective	KeepWinner Delayed
Joke Quality	3.65	3.84	3.47	3.46	3.81	3.78			3.57
(round 1)	(1.19)	(1.17)	(1.28)	(1.17)	(1.43)	(1.11)			(1.20)
Joke Quality	3.57	3.70	3.39	3.40	3.89	3.51			3.61
(round 2)	(1.20)	(1.19)	(1.45)	(1.27)	(1.12)	(.98)			(1.71)
Objective Score	174							174	
(round 1)	(15)							(15)	
Objective Score	177							177	
(round 2)	(17)							(17)	
Worker Confidence	.51	.48	.49	.55	.55	.41		.62	.46
(round 1)	(.26)	(.27)	(.26)	(.27)	(.24)	(.24)		(.18)	(.28)
Worker Confidence	.49	.44	.41	.54	.53	.39		.59	.46
(round 2)	(.26)	(.27)	(.30)	(.27)	(.28)	(.15)		(.20)	(.26)
Psychology	.13	.11	.13	.14	.03	.18	.17	.17	.09
	(.34)	(.31)	(.35)	(.35)	(.18)	(.39)	(.38)	(.38)	(.29)
Economics	.25	.27	.23	.27	.43	.25	.37	.17	.19
	(.43)	(.44)	(.43)	(.45)	(.50)	(.44)	(.49)	(.38)	(.39)
Other Social Science	.06	.03	.03	.05	.07	.08	.10	.08	.04
	(.23)	(.18)	(.18)	(.22)	(.25)	(.28)	(.31)	(.27)	(.21)
Biology/Chemistry	.27	.31	.43	.23	.23	.15	.23	.26	.36
	(.45)	(.46)	(.50)	(.42)	(.43)	(.36)	(.43)	(.44)	(.48)
Engineering/Science	.21	.22	.17	.20	.17	.22	.07	.22	.26
	(.41)	(.41)	(.38)	(.40)	(.38)	(.42)	(.25)	(.41)	(.44)
Humanities Major	.07	.07	.00	.08	.07	.10	.07	.10	.06
	(.26)	(.25)	(.00)	(.27)	(.25)	(.30)	(.25)	(.30)	(.23)
Undeclared Major	.01	.00	.00	.03	.00	.02	.00	.01	.01
	(.10)	(.00)	(.00)	(.16)	(.00)	(.13)	(.00)	(.10)	(.11)
Asian Ethnicity	.69	.65	.83	.79	.70	.72	.60	.67	.60
	(.46)	(.48)	(.38)	(.41)	(.47)	(.45)	(.50)	(.47)	(.49)
Female	.58	.56	.50	.66	.47	.57	.57	.54	.60
	(.49)	(.50)	(.51)	(.48)	(.51)	(.50)	(.50)	(.50)	(.49)
Nonnative Speaker	.20	.18	.13	.30	.23	.15	.20	.14	.18
	(.40)	(.39)	(.35)	(.46)	(.43)	(.36)	(.41)	(.35)	(.38)
Age	21.0	21.1	20.6	21.0	20.3	20.6	21.0	21.5	21.2
	(3.32)	(3.12)	(1.65)	(3.83)	(2.15)	(1.81)	(1.30)	(5.13)	(2.34)
Observations	573	120	30	120	30	60	30	93	90

Notes: Descriptive statistics. Joke quality is the average rating of the joke by the independent raters. Objective performance is the score on the objective task for treatment Objective. Confidence is the worker's confidence in having a better joke or performance than the other worker. The remaining variables are dummies for the respective majors, Asian participants, females, and nonnative speakers, and a continuous variable for age, respectively. Among the nonnative speakers, 12% are Chinese native speakers, 2% are Spanish native speakers, and the remainder report different languages. We are missing the descriptive statistics for 2 referees; the descriptive statistics presented here are therefore based on only 571 observations.

we use one worker as one independent observation; whenever we analyze referee behavior, we use one referee as one independent observation. For nonparametric tests involving data from both rounds, we therefore take the average over both rounds as the unit of observation. We first analyze worker and referee behavior in the two main treatments, KeepWinner and KeepBoth. We then discuss the additional treatments to investigate inequity aversion and the importance of moral costs of distortion.

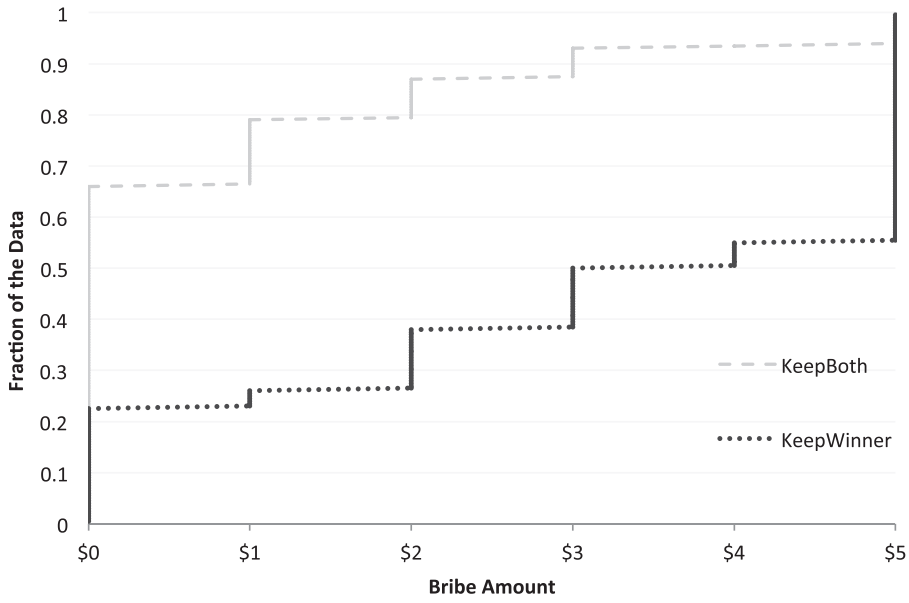

FIGURE 1. CDF of Bribes for KeepWinner and KeepBoth. Empirical cumulative distribution function of all bribes sent in treatments KeepWinner and KeepBoth.

3.1. Worker Behavior

The main goal of the paper is to investigate whether and why bribes distort choices. To do so, we first need to verify that workers were willing to bribe, and that there was sufficient variation in bribe sizes. Figure 1 shows the distribution of bribes in the KeepWinner treatment for both rounds. The first thing to note is that many workers bribed and there was considerable variation in bribe amounts: 90 out of 200 bribes (45%) were at the maximum $5 and a further 32.5% of bribes were between $1 and $4. In 22.5% of the cases, workers elected not to send a bribe. Overall, the average bribe was $3.09.

As Figure 1 also shows, the workers in treatment KeepBoth bribed less than the workers in treatment KeepWinner. Overall the average bribe in this treatment was $0.82 and no bribe was sent in 66% of the 200 cases. The difference in the distribution of bribes between the KeepWinner and the KeepBoth treatments is significant ($p < 0.001$; Mann–Whitney). In Online Appendix B.2, we further examine whether worker-level characteristics are predictive of bribe size. Over all treatments, we find that non-native speakers and older participants send higher bribes, whereas social science majors (not including economists and psychologists) send lower bribes. Bribe size is not correlated with joke quality ($r = 0.04$, $p = 0.43$).

Table 3 reports the distribution of bribes and the average bribes per round for all treatments. On average, in the KeepWinner treatment, bribes did not change between rounds: the average bribe was $2.97 in the first round and $3.20 in the second round

TABLE 3. Bribes across treatments.

	Overall	Keep Winner	Keep Both	High Wage	No Task	Objective	Keep Winner Delayed
			Bribe frequencies (both rounds)				
Bribe = 0	40%	23%	66%	53%	25%	31%	32%
Bribe = 1	8%	4%	13%	5%	5%	8%	8%
Bribe = 2	10%	12%	8%	9%	15%	10%	8%
Bribe = 3	9%	12%	6%	4%	18%	6%	11%
Bribe = 4	4%	5%	1%	1%	15%	2%	7%
Bribe = 5	30%	45%	7%	29%	23%	42%	36%
			Average bribe sent				
Round 1	2.26	2.97	1.01	2.08	2.95	2.66	2.67
	(2.15)	(2.07)	(1.58)	(2.34)	(1.79)	(2.19)	(2.20)
Round 2	2.12	3.20	.62	1.58	2.25	2.69	2.55
	(2.14)	(2.01)	(1.24)	(2.06)	(1.97)	(2.21)	(2.11)
Both Rounds	2.19	3.09	.82	1.83	2.60	2.68	2.61
	(2.14)	(2.04)	(1.43)	(2.20)	(1.89)	(2.20)	(2.15)
			Average difference in bribes (excluding equal bribes)				
Round 1	3.14	3.00	2.78	4.21	2.63	3.16	3.00
	(1.49)	(1.45)	(1.55)	(1.31)	(1.30)	(1.45)	(1.49)
Round 2	2.90	3.05	2.36	3.42	3.00	2.95	3.18
	(1.51)	(1.35)	(1.53)	(1.73)	(1.41)	(1.67)	(1.47)
Both Rounds	3.02	3.03	2.59	3.85	2.82	3.13	2.83
	(1.50)	(1.39)	(1.54)	(1.54)	(1.33)	(1.56)	(1.53)
N: per round	382	100	100	40	20	62	60
N: both rounds	764	200	200	80	40	124	120

Notes: The table gives the relative frequency of bribes of different sizes in the upper panel. The middle panel displays average bribe size (over all workers) separately as well as jointly for each treatment and round. The lower panel displays the average difference in bribes (over all workers) separately as well as jointly for each treatment and round. Average bribes are computed using all bribes, including zeros. Average differences in bribes are computed by subtracting the highest bribe from the lowest bribe in a given pair of bribes and are based only on observations in which the two bribes were not identical. The numbers in brackets are standard deviations. Treatments KeepWinner and KeepBoth combine the data of both treatment variations (baseline and reject).

(the difference is not statistically significant). In treatment KeepBoth, the average bribe was \$1.01 in round one and \$0.62 in round two ($N = 100$, $p = 0.012$; Wilcoxon signed-rank test).[2] Workers who bribed more in round 1 were also likely to bribe more in round 2 ($r = 0.62$, $p < 0.001$ in KeepWinner; $r = 0.42$, $p < 0.001$ in KeepBoth).

This analysis shows that there is a treatment difference in worker behavior in terms of bribes. However, in terms of referee behavior, we are interested in analyzing cases where referees receive bribes of a different size from the two workers. Specifically, we

2. However, this effect is only driven by a few observations. 68 of the 100 workers bribed exactly the same in the second round, 9 people bribed more, and the remaining 23 people bribed less.

will analyze whether referees select the better joke or the higher bribe as the winner, and whether the likelihood of doing so depends on the absolute difference between the two bribes (or difference in quality of the two jokes).

It is therefore important to investigate whether the difference in bribes is similar across treatments. The results are presented in the lower panel of Table 3. We focus on cases where referees received two bribes of different sizes (or only one bribe), as these are the only cases where the size of the bribe could affect which worker they selected as the winner. 74 referees (44 in KeepWinner, 30 in KeepBoth) faced bribes of different sizes in at least one of the rounds (50 in both rounds, 24 in only one round). We find that for these referees the average difference between the two bribes received does not significantly differ between treatment KeepWinner ($3.03) and treatment KeepBoth ($2.59; $p = 0.272$, Mann–Whitney based on 44 and 30 referees, respectively). Hence, despite bribes being larger in treatment KeepWinner overall, referees who received bribes of different sizes still faced similar financial tradeoffs in both treatments.

However, referees in treatment KeepBoth were also more likely to receive two identical bribes, less likely to face two positive bribes, and less likely to receive two large bribes. We control for receiving two identical bribes in our regression analysis by examining the cases in which bribes differ separately from the cases where bribes are identical. We discuss the latter two differences in Online Appendix B.3 and show that neither of them affects our main results.

Joke Quality. In order to investigate referee behavior and make treatment comparisons, it is also important that the quality of the jokes is similar across treatments. To investigate whether this is the case, we use the evaluation provided by the independent raters as an unbiased measure of joke quality. For our analysis, we are interested in investigating whether the referee selects the better joke as the winner. For this purpose, we will focus on two measures of quality: the difference in average rating between the two jokes in a pair and the fraction of independent raters that, for a given pair, chose the same joke as the better one (i.e., the degree of agreement across raters). The two measures are highly correlated ($r = 0.91$, $p < 0.001$ for all joke treatments combined). Neither measure differs significantly between KeepWinner and KeepBoth ($p > 0.78$, Mann–Whitney). In Online Appendix B.2, we examine predictors of high quality jokes and find no evidence that bribes are predicted by joke quality, suggesting that overall the quality of workers' performance did not affect their bribing behavior.

3.2. Does Bribery Distort the Referee's Judgment?

In this section, we examine whether and why bribery distorts referees' judgment, using both nonparametric tests and regressions. For the nonparametric tests, we investigate whether the worker with the higher bribe in the pair won the prize. We also investigate whether the worker with the better joke in the pair won the prize. Since joke quality is subjective, it is not enough for one joke to have a slightly higher quality on either of the two quality measures. Instead, we need to know whether one joke is *significantly*

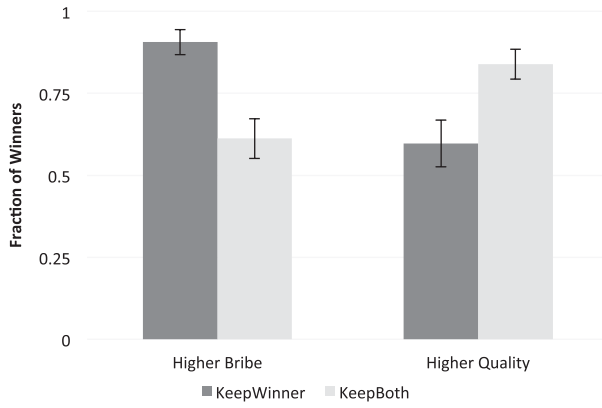

FIGURE 2. Fraction of referees selecting the worker with the higher bribe or better joke as the winner. The figure plots the fraction of cases in which the higher bribe or higher quality joke won in the respective treatments. Workers are classified as having a higher quality joke when at least 65.1% of independent raters agree their joke is better. Error bars present +/− one standard error, calculated at the referee level.

better than the other. For this purpose, we consider all joke pairs for which at least 65.1% of the independent raters agreed on the winner. With this threshold, the fraction of independent raters who selected a given joke over the other is significantly different from chance (i.e., 50%) at the 10% level ($z = 1.28$, $p = 0.1$, test of proportions for our minimum of 18 independent raters). By this threshold, 61% of 300 joke pairs across all relevant treatments have a significantly better joke.

In the remaining pairs, the quality of the two jokes was too similar to be statistically distinguishable. In such cases, picking one joke over the other did not constitute a big distortion. Whenever we refer to better-quality jokes in subsequent nonparametric tests, we will only use jokes that are sufficiently different by this criterion. Note, however, that in the regression analysis we will use all the observations, including cases where bribes and/or quality were similar. Online Appendix B.4 shows that for a threshold of 69.4%, which corresponds to jokes being significantly different at the 5% level, the results are similar.

The KeepWinner Treatment. Did bribery result in a distortion of the referees' judgment? In treatment KeepWinner, nearly all referees (44 out of 50) received bribes of different size in at least one of the two rounds. In 68 out of 75 total cases across the two rounds (91%), referees chose the worker who offered the higher bribe as the winner. The fraction of referees who chose the higher bribe is significantly larger than chance, that is, 50% ($N = 44$; $p < 0.001$, Wilcoxon). By contrast, as Figure 2 shows, the better joke (as judged by the independent raters) won only 60% of the time (40 out of 67 total cases). The fraction of referees selecting the better joke is slightly higher than chance, but not significantly so ($N = 44$; $p = 0.117$, Wilcoxon). When we restrict

our sample to the 47 cases where the two bribes were unequal, referees selected the best jokes in only 55% of cases ($N = 36$ referees; $p = 0.480$). Thus, these results suggest that bribery distorted referees' judgment because they chose the worker who paid them more, not the one who wrote the funnier joke.

We further investigate the effect of bribes and quality using OLS. In the regression, we examine how differences in joke quality (as determined by the independent raters) and bribes between the two workers affect the referee's decision. For a given worker, the regression tells us how an increase in her bribe or joke quality relative to the other worker affects her probability of winning. The more referees care about quality as opposed to bribes, the more beneficial having a better joke should be. To facilitate comparisons between coefficients, we standardize all independent variables, such that the coefficients represent the effect of a one-standard-deviation increase in the independent variable.

On a more methodological level, because our independent variables are differences between the two workers within a given pair, the observations for the two workers are always the exact inverse of each other. Hence, for the regression we randomly select one worker per round. We use the same random sample throughout the analysis. In Online Appendix B.5, we show that the reported results do not depend on the particular combination of workers in the pair randomly selected for the regression. Randomly selecting a worker also implies that selected workers on average win approximately 50% of the time; as a result, we do not report the constant in the regression table. This also implies that we cannot control for referee-level variables such as gender and other demographics.

For quality, we estimate separate coefficients for cases in which the two bribes are identical and cases in which they differ. The latter coefficient is of particular interest because it allows us to examine the effect of quality when referees could also be influenced by bribes. The former coefficient instead allows us to see whether quality affects the likelihood that a given worker wins the prize when referees have no incentive to distort their judgment. Finally, we compute the p-values reported in the regression tables using a wild bootstrap. Cameron et al. (2008) show that this approach leads to more accurate (and more conservative) p-values than alternative techniques whenever the number of clusters is small. Using clustered standard errors and a nonparametric bootstrap yields very similar results (see Online Appendix B.6).

Column (1) of Table 4 presents the results. The coefficient for bribes is large, positive, and statistically significant. Indeed, a one-standard-deviation increase in a given worker's bribe (relative to the bribe of the other worker) increases her likelihood of winning the prize by 33 percentage points. By contrast, the coefficient for quality when bribes differ is small and not statistically significant. Thus, the regression results confirm that bribes, not quality, influenced referees in treatment KeepWinner. The results also show that when bribes are identical and therefore cannot distort behavior, an increase in the quality of a given worker's joke (relative to the other worker) does significantly increase her likelihood of winning. This finding shows that despite the subjective nature of the task, referees were indeed capable of identifying the higher-quality joke in the absence of distortionary incentives.

TABLE 4. Regression analysis for referees in KeepWinner and KeepBoth.

Dependent variable	Winner (1 = yes)		
	(1)	(2)	(3)
Bribe Difference	.331***	.110*	.331***
	(.000)	(.064)	(.000)
Quality Difference (bribes differ)	−.016	.228***	−.016
	(.742)	(.000)	(.742)
Quality Difference (bribes identical)	.184**	.290***	.184**
	(.022)	(.000)	(.022)
D_{KeepBoth}			.004
			(.968)
Bribe Difference × D_{KeepBoth}			−.221**
			(.010)
Quality Difference × D_{KeepBoth} (bribes differ)			.244***
			(.000)
Quality Difference × D_{KeepBoth} (bribes identical)			.105
			(.200)
Treatment	KeepWinner	KeepBoth	KeepWinner KeepBoth
Selected Workers	Random	Random	Random
Observations	100	100	200
Clusters	50	50	100
R^2	.533	.239	.387

Notes: OLS estimates (p-values). The dependent variable is a dummy that specifies whether the selected worker was chosen as the winner. Quality Difference is the difference between the quality of the joke (i.e., the average rating by the independent raters) of the selected worker and the quality of the joke of the other worker in the pair. The coefficient for Quality Difference is estimated separately for cases where the two workers sent the same bribes and cases where the two bribes differed in size. Bribe Difference is the difference between the bribe sent by the selected worker and the bribe sent by the other worker in the pair. D_{KeepBoth} is a dummy that is equal to one for treatment KeepBoth, and zero otherwise. p-values are calculated using a wild bootstrap clustered at the referee level. For each regression, we randomly select one worker per referee in each round. *Significant at 10% level; **significant at 5% level; ***significant at 1% level.

The KeepBoth Treatment. Figure 2 and column (2) of Table 4 give an overview of the referees' behavior in the KeepBoth treatment. Out of 50 referees, 30 received bribes of different sizes in at least one round, for a total of 49 cases. In 30 out of 49 cases (61%), referees chose the worker who offered the higher bribe as the winner. The fraction of referees who chose the higher bribe as the winner is larger than chance, but not significantly so ($N = 30$; $p = 0.127$, Wilcoxon). By contrast, the better joke, as judged by our independent raters, won 84% of the time (i.e., 47 out of 56 cases). The fraction of referees selecting the better joke is significantly larger than chance ($p < 0.001$, Wilcoxon, based on 41 referees). In other words, when the referees' payoff did not depend on the choice of winner, bribery did not distort judgment, and referees chose the worker who wrote the funnier joke.

The regression results are similar. Column (2) of Table 4 shows that an increase in the quality of a given worker's joke (relative to the other worker's joke) significantly increased her likelihood of winning. The effect of joke quality on the likelihood of

winning was similar when bribes were identical and when bribes differed. Bribes also seem to have played a role: a one standard deviation increase of a given worker's bribe (relative to the other worker) increased her likelihood of winning the prize by 11 percentage points; the effect is significant at the 10% level. However, the effect of bribes is driven by cases where the quality of the two jokes was similar: in cases where two jokes differed in quality, bribes no longer had a significant effect (see the analyses in Online Appendix B.7). These results therefore suggest that referees were likely to choose the worker who wrote the funnier joke in this treatment.

Greed versus Reciprocity. Having a higher bribe was more effective in the KeepWinner treatment (91% vs. 61%; $p < 0.001$; Mann–Whitney based on 44 and 30 referees, respectively), whereas having a better joke was more effective in the KeepBoth treatment (84% vs. 60%; $p = 0.003$; Mann–Whitney based on 44 and 41 referees). The latter effect is driven exclusively by cases for which bribes were different. When bribes were *equal*, referees *in both treatments* (70% of 20 cases for KeepWinner, 79% of 24 cases for KeepBoth) picked the better joke ($p = 0.435$; Mann–Whitney based on 15 referees and 18 referees, respectively). When bribes were *unequal*, referees in KeepBoth selected the better joke in 28 out of 32 cases (88%), compared with only 55% (26 out of 47 cases) of the referees in KeepWinner ($p = 0.006$, Mann–Whitney based on 24 and 36 referees, respectively). The pattern is strongest in cases where the better joke corresponded to the lower bribe, and hence bribes and quality were in direct conflict. In these cases, the 16 referees in KeepBoth selected the better joke in 14 out of 18 cases (78%), versus only 3 out of 21 cases (14%) in KeepWinner ($p < 0.001$, Mann–Whitney based on 16 and 18 referees, respectively).

These findings are confirmed by the regression of column (3) in Table 4, where we compare the two treatments and interact the quality and bribe variables with a dummy for treatment KeepBoth. The interaction terms confirm that when bribes were unequal, the effect of quality was significantly larger in treatment KeepBoth, whereas the effect of bribes was smaller. Further, in cases in which bribes were equal, the importance of quality was approximately the same in both treatments. These results confirm the results of the nonparametric tests and show that referees distorted their judgment to a greater extent in the KeepWinner treatment, supporting the greed explanation of bribery.

In Online Appendix B.3, we report additional analyses in which we investigate the effect of absolute bribe size and explore whether receiving one or two bribes affected behavior. We find that referees behaved similarly irrespective of the absolute size of the bribes or the number of bribes received. This also implies that reciprocity by itself was not enough to convince referees to distort their judgment, even in cases in which referees only received a single bribe and reciprocal behavior therefore did not require them to betray another worker who bribed.[3]

3. Previous studies examining reciprocity typically involve only two players. If two bribes are offered in our experiment, reciprocity may be less powerful, because reciprocating the higher bribe requires the

Although the analysis reported thus far pools the data from both rounds, it seems conceivable that referees behave differently in each round. For example, some referees may choose to award the prize to one worker in the first round, and then choose the other worker in the second round. In Online Appendix B.8, we study round effects and find evidence consistent with alternating in treatment KeepBoth. Conditional on quality and bribes, round 1 losers are significantly more likely to win in round 2. We find no such evidence in treatment KeepWinner. When accounting for alternating, however, the main coefficients for quality and bribes are largely unaffected. This suggests that alternating may only emerge when neither greed nor joke quality could determine referee behavior. Overall, allowing for alternating does not affect any of our main conclusions.

Taken together, the results show that referees awarded the prize to the worker with the higher bribe in treatment KeepWinner, but were more likely to select the one with the better joke in treatment KeepBoth. This finding is in line with the greed explanation of bribery. When referees are motivated by greed (treatment KeepWinner), they distort their judgment. However, when only reciprocity could lead referees to select the higher bribe (treatment KeepBoth), they instead tend to select the better joke, unless the two jokes are very similar. This observation suggests greed is more important than moral costs, which are in turn more important than reciprocity.

Inequity Aversion. In treatment KeepWinner, inequity aversion predicts that referees choose the worker with the higher bribe, whereas in treatment HighWage, it predicts the opposite. However, the results of this treatment are similar to treatment KeepWinner: the higher bribe won 88% of the time (23/26 cases), compared with 91% in KeepWinner, whereas the better-rated joke won 44% of the time (11/25 cases), compared with 60% in KeepWinner. Neither difference is significant in either nonparametric tests or in regressions (regression results available upon request). The only difference between the HighWage and the KeepWinner treatment relates to workers' behavior: their average bribe was significantly lower in HighWage than in KeepWinner (\$1.80 vs. \$3.09; $p < 0.001$; Mann–Whitney).

3.3. Moral Costs and the Role of Self-Serving Evaluations

In this section, we investigate whether bribes also have an indirect effect by changing the way referees evaluate outcomes. For this purpose, we first confirm the importance of moral costs by comparing treatment KeepBoth to a control treatment where referees are no longer asked to judge performance on a task (treatment NoTask). We then discuss the results of two treatments that attempt to increase the importance of moral costs by decreasing the scope for self-serving evaluations (treatments Objective and KeepWinnerDelayed).

referee to betray the other worker. However, our results indicate that referees in KeepBoth refused to reciprocate the higher bribe even in cases where only one referee sent a bribe.

The NoTask Treatment. Treatment NoTask is a variation of treatment KeepBoth, where we remove all moral costs of distortion by no longer asking referees to judge performance on a task. Hence, we expect reciprocity to become more important. Indeed, the higher bribe won 94% of the time (16 out of 17 cases), which is significantly larger than chance ($p = 0.011$; Wilcoxon based on 10 referees) and significantly larger than in KeepBoth ($p = 0.034$; Mann–Whitney based on 10 and 30 referees, respectively). We find similar results using a regression analysis, reported in Appendix A.1. Perhaps anticipating this, workers bribe significantly more than in treatment KeepBoth ($p < 0.001$, Mann–Whitney based on 20 and 100 workers, respectively). In summary, referees were happy to award the prize to the worker who sent them more money when rewarding them did not require a distortion of their judgment, but did not reciprocate the higher bribe when doing so required them to award the prize to the worst performer. Thus, in the absence of moral costs, reciprocity guides referees' behavior. By contrast, in other treatments the moral costs of distorting judgment seem stronger than the norm of reciprocity.

The Objective Treatment. Lacking objective standards, referees in treatment KeepWinner may have been able to convince themselves that the worker with the highest bribe also wrote the best joke, thereby lowering moral costs. By contrast, treatment Objective uses a more objective task that limits such ambiguity in the evaluation of participants' performance and could therefore be expected to reduce the scope for self-serving evaluations and thereby increase moral costs.

Consistent with this hypothesis, having a better performance was more effective in the Objective treatment (40 cases) than in the KeepWinner treatment (80% vs. 60%, $p = 0.045$, Mann–Whitney; based on 26 and 44 referees, respectively), whereas it was similarly effective as in the KeepBoth treatment (80% vs. 84%; $p = 0.457$; Mann–Whitney; based on 26 and 41 referees, respectively).[4] In contrast with our hypothesis, however, having a higher bribe (39 cases) was not significantly less effective than in treatment KeepWinner (77% vs. 91%; $N = (25,44)$, $p = 0.158$; Mann–Whitney) and was in fact significantly more effective than in treatment KeepBoth at the 10% level (77% vs. 61%; $N = (25,30)$, $p = 0.095$; Mann–Whitney). The regression analysis presented in Appendix A.1, which accounts for the fact that the tendency to reward the higher bribe may depend on the difference in the two bribes, provides stronger support for our hypothesis. Both bribes and quality played a similar role as in treatment KeepBoth and a significantly smaller (bribes) or larger (quality) role than in treatment KeepWinner. Overall, the reduction in distortion observed in this treatment suggests

4. In treatment Objective, we use participants' actual scores as their performance (quality) measure. Similar to the other treatments, we omit the 35% *least distinguishable* performance pairs whenever we refer to better-quality performers in our nonparametric tests. In practice, this approach means that we only look at pairs in which the difference in performance was at least 11 words. If we instead include all cases for treatment Objective, better performers only win 74% of the time, which is no longer significantly greater than in KeepWinner ($p = 0.217$), and is significantly smaller than in KeepBoth ($p = 0.039$).

that moral costs are indeed higher when the objective nature of the task makes it more difficult to justify distortion.

The KeepWinnerDelayed Treatment. Based on previous work on self-serving biases, we expected that evaluating the jokes before learning about the bribes would make it more difficult for referees to persuade themselves that the worker with the higher bribe also wrote the better joke.

Nonparametric tests provide support for this idea. We find that in 29 out of 36 cases (81%), referees awarded the prize to the best performer. This is significantly more than in KeepWinner ($p = 0.044$; Mann–Whitney based on 24 and 44 referees respectively) and similar to KeepBoth ($p = 0.539$; Mann–Whitney based on 24 and 41 referees, respectively). Similarly, the worker with the higher bribe received the prize in 33 out of 45 cases (73%). Referees were less likely to award the prize to the higher bribe than in treatment KeepWinner ($p = 0.042$; Mann–Whitney based on 26 and 44 referees, respectively), and about as likely as in treatment KeepBoth ($p = 0.302$, Mann–Whitney based on 26 and 30 referees, respectively).

We find similar results in the regression analysis reported in Appendix A.1. In Online Appendix B.9, we present evidence that evaluating the jokes before receiving the bribes decreased the extent to which referees distorted their personal evaluations of quality. Taken together, these results suggest that referees found it more difficult to persuade themselves that the worker with the worst joke deserved to win the prize, increasing the moral costs of distortion, and reducing the effectiveness of bribes.

Summary. Taken together, our data support the idea that referees in the KeepWinner treatment were able to (conveniently) convince themselves that the worker with the highest bribe also wrote the best joke. When we limit the scope for this kind of rationalizing behavior in the Objective and KeepWinnerDelayed treatment, bribes become less important, and referees are more likely to select the best joke as the winner.

4. An Experiment in the Market in Shillong, India

The results of our laboratory experiment suggest that the mechanism by which bribes distort the referees' decisions is greed and not reciprocity. Here, we complement the laboratory evidence on greed versus reciprocity with evidence from an experiment run in a market in India. Whereas the lab experiments allow us to disentangle between the different mechanisms of bribery in a clean setting, the extra-laboratory experiment allows us to investigate whether our results generalize to a population and environment that are more regularly exposed to bribery than UC San Diego students.

4.1. Experimental Design

We conducted the experiment at the market in the city of Shillong, in the state of Meghalaya in northeast India over the course of a single day. Bribery and corruption are prevalent in India (Transparency International 2014), and Meghalaya is thought to be among the most corrupt states in India (Transparency International India 2008).

To investigate the importance of reciprocity and greed in this population, we approached shoppers at the market and asked them to taste two different pineapples, each purchased from a different vendor, and tell us which of the two they thought tasted better. In addition to tasting the pineapples, participants (i.e., the shoppers) received monetary payments ("bribes") from the vendors. This design allows us to investigate whether participants chose the higher quality product (i.e., the best tasting pineapple), or the product from the vendor who sent them a larger payment. As with the joke task in the lab experiment, we chose this task because selecting the tastier pineapple is at least partially based on the decision maker's subjective judgment.

Procedures. The procedures of the experiment were as follows. First, we approached two fruit vendors in the market, A and B, and invited them to participate in the study. They were both selling pineapples and their stands were not close to each other. We explained to the sellers that, if they participated, we would purchase some of their pineapples. We also told them that we would ask shoppers to taste both their pineapple and a pineapple from another seller in the market, and indicate which of the two was tastier. We told the sellers that every time a shopper recommended their pineapple, we would purchase an additional pineapple from their stand at a price of 60 rupees (approximately $1 at the time).

In return, both sellers agreed to pay some money to each shopper who chose his pineapple (other than those in the control treatment, see in what follows). In particular, seller A agreed to pay 10 rupees and seller B agreed to pay 20 rupees. Both sellers also agreed that in half of the cases, they would pay these amounts even if the shopper did not choose their pineapple. We then bought several pineapples from each seller, and selected the two best pineapples from seller A (pineapples A1 and A2), and the two worst pineapples from seller B (pineapples B1 and B2). For this purpose, four experimenters tasted each of the pineapples we bought. We chose the four pineapples such that all four experimenters thought pineapple A1 was tastier than pineapple B1, and pineapple A2 was tastier than pineapple B2. We then cut each selected pineapple into small pieces that we placed in separate bowls. Determining the combination of quality and "bribes" in this way implies that the better tasting pineapple (A1, A2) was always matched to the lower bribe (10 rupees). In this way, a trade-off between quality and bribes always existed, increasing the power of our study. Further, this procedure ensured that all participants received the same combination of quality and bribes.

We then randomly approached 120 market visitors (shoppers) in the market, one by one. The experiment was conducted by two research assistants, a male and a female. The research assistants approached shoppers in the market and asked each of them

whether he or she was willing to help us taste a sample from two different pineapples, and tell us which of the two they thought tasted better. The first 60 participants tasted pineapple A1 and pineapple B1; the other 60 participants tasted pineapple A2 and pineapple B2. The procedure for the first and the second group was the same.

Shoppers were informed that, upon receiving their recommendation, we would buy a pineapple from the same seller (i.e., the one they indicated had the tastier pineapple). Shoppers were not provided additional information on the reasons behind the pineapple purchase. Apart from their recommendation, we did not collect any information from them.

We conducted three treatments, with 40 participants in each treatment (20 for each set of pineapples). The first treatment was a control treatment with no bribes, whereas the other two were analogous to treatments KeepWinner and KeepBoth in the lab experiment. In the Control treatment, we asked the research assistants to follow the following script. When approaching a participant, our assistants asked the participant whether he or she was willing to help with a short question. If the shopper answered positively, we asked the research assistants to tell the participant the following (translated to the local language—Khasi): "Thank you for agreeing to help us. We will pay you 10 rupees for your time. We would like to ask you to tell us which of these two pineapples is tastier. It is important for us because we will buy an extra pineapple from the seller who sold us the one you will tell us is tastier. Please taste both pineapples and tell us which one is tastier".

The research assistants then asked participants to taste both pineapples and indicate which one was tastier. Participants received their payment of 10 rupees after making their choice. During the experiment, research assistants were instructed to switch the hands in which they were holding the bowls after each participant, and always start the tasting with the bowl on the left hand. In this way, we counterbalanced any order effect.

Treatment KeepWinner was similar to the Control treatment, but instead of paying participants 10 rupees for tasting the pineapples we told them that each seller had offered them some money if they recommended their respective pineapple. In particular, participants were informed that seller A had offered 10 rupees to those who chose his pineapple, and seller B had offered 20 rupees to those who chose his pineapple. Participants were also told they could only keep the money offered by the seller of the pineapple that they indicated as tastier. The following additional wording was added to the script before we asked participants to taste the pineapples: "The seller of this pineapple [the RA holding the bowls raised the bowl containing pineapple A1 or A2] offered you 10 rupees if you will choose his pineapple, and the seller of this pineapple [now the bowl containing pineapple B1 or B2 was raised] offered 20 rupees to you if you will choose his pineapple. As a result, you will be paid 10 rupees if you choose this one and 20 rupees if you choose this one [again, the respective bowls were raised]". Participants then tasted both pineapples, chose one, and were paid according to their choice.

Treatment KeepBoth was similar to treatment KeepWinner, except that participants were told that regardless of their choice, they would be paid both the 10 rupees offered

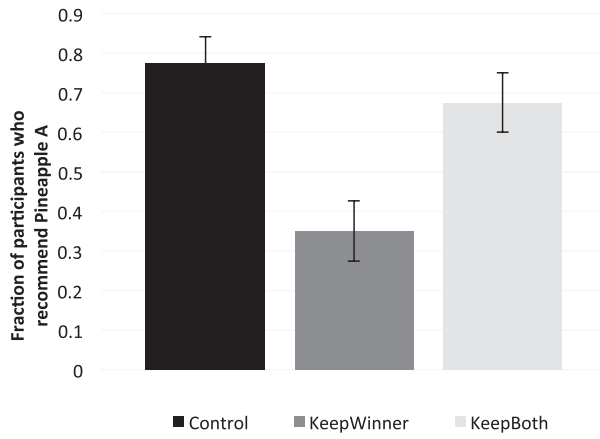

FIGURE 3. The fraction of participants who choose the tastier pineapple (A) by Treatment. Error bars represent +/− one standard error.

by seller A and the 20 rupees offered by seller B. Specifically, the protocol was as follows: "The seller of this pineapple [the RA holding the bowls raised the bowl containing pineapple A1 or A2] offered you 10 rupees and the seller of this pineapple [the bowl containing pineapple B1 or B2 was raised] offered 20 rupees. As a result, you will be paid 30 rupees regardless of your choice". Participants then tasted both pineapples, chose one, and received their payment.

Participants were not given any additional information on the purpose of the request or on the reasons behind the sellers offering a payment. It is possible that the shoppers may have found the situation unusual, but these concerns apply equally to all treatments and we do not expect shoppers' perceptions of the situation to interact with the treatment in particular ways. In addition, no shopper declined to help us taste the samples and indicate the better pineapple after hearing about the payments from the sellers.

4.2. Results

The results are presented in Figure 3. In the Control treatment, 77.5% of the participants indicated pineapple A was tastier. This fraction is significantly larger than predicted by chance (i.e., 50%; $N = 40, p < 0.001$, test of proportions), which suggests that pineapple A was indeed tastier than pineapple B. Thus, in this treatment, most participants agreed with the experimenters that pineapple A tasted better than pineapple B.

In treatment KeepWinner, participants chose pineapple A only 35% of the time. The difference between the fraction of participants choosing pineapple A in KeepWinner and in the Control treatment is significant ($p < 0.001$, test of proportions).

In treatment KeepBoth, the fraction of participants choosing pineapple A was 67.5%, which is significantly higher than the fraction observed in the KeepWinner

treatment ($p = 0.004$, test of proportions), and does not differ from the Control treatment ($p = 0.317$, test of proportions).

We confirm these results using regression analysis, see Appendix A.2 for the full results. Overall, the results of the extra-laboratory experiment replicate the results we observed in the laboratory in San Diego. When participants are motivated by greed (treatment KeepWinner), they distort their judgment. However, when only reciprocity could lead participants to select the higher bribe (treatment KeepBoth), they instead mostly select the better pineapple. Hence, our results from the laboratory generalize to a nonlaboratory setting and to a population that is more regularly exposed to bribery than UC San Diego students.

5. Concluding Remarks

Bribery is widespread and has an important impact on the way decisions are made in politics, business, sports, education, and many other domains, with potentially large economic consequences. Some argue that bribes are not necessarily bad for society but are simply used to "grease the wheels" of bureaucracy (e.g., Leff 1964; Huntington 1968). Even in these cases, when bureaucrats can endogenously choose the level of corruption, bribes clearly have a negative effect on economic efficiency (Banerjee 1997).

The purpose of the current paper is to investigate the behavioral mechanisms through which bribes affect the judgment of individuals with discretionary power. We find that when incentives are contingent on choices, referees in our laboratory experiment accept and reward bribes. However, when bribes are not contingent on delivering a certain outcome, they do not distort judgment. The field experiment we conducted in the market in India confirms these results with a population that is more accustomed to bribery.

These results imply that in our experiments the norm of reciprocity is weaker than the moral costs of distorting judgment, which are weaker than profit maximization. Our ability to rank these different forces comes from the experimental bribery game that we introduce, which is able to capture the moral costs of distortion that arise when bribes, rather than performance, are rewarded. Indeed, the degree of distortion has a large effect on explaining whether referees reciprocate the higher bribe. This is illustrated by our treatment NoTask, where the referee's decision no longer involves any distortion of judgment, and referees consistently award the prize to the higher bribe, even when bribes are not contingent on delivering a certain outcome. By capturing this type of distortion, we are able to show that moral costs are more important than reciprocity.

We further show that that the impact of bribes is reduced when moral costs increase. When referees' scope for engaging in self-serving evaluations is limited, thereby making moral costs of distortion more salient, referees are less likely to ignore quality. In other words, bribes are most effective when they can generate motivated beliefs and self-serving bias. This result suggests that policy interventions that focus on increasing

the moral costs of distortion, for example by implementing more objective standards, may provide an alternative way to reduce the effectiveness of bribes.

Our design also allows us to link the literature on corruption to the behavioral economics literature on the moral costs of deception, and especially the literature on motivated beliefs. Although motivated beliefs are thought to be particularly prevalent in settings where there is a conflict between morality and self-interest, previous studies on corruption have limited the scope for motivated beliefs by focusing on objective decision environments. By instead studying bribery in a subjective environment, we are able to show that motivated beliefs can facilitate corrupt behavior. In so doing, our results also illustrate that moving from an objective decision environment to a more subjective one increases the prevalence of self-interested behavior. These findings may also have implications beyond the literature on corruption, suggesting that subjectivity in evaluations and decision criteria may increase other types of unethical behavior, such as dishonest advice (Gneezy et al. 2017) or discrimination in hiring (Danilov and Saccardo 2017).

Future research could extend the game we introduced to other important directions. For example, in our experiment, workers who lost because of bribery suffered the negative externality of distorted justice. This negative externality did not reduce the overall wealth of the participants. In many real-world cases of bribery, however, the negative externality could be larger and reduce the overall earnings. Our game could be extended by incorporating a negative externality on an innocent third party (e.g., Falk and Szech 2013) or by making bribery welfare decreasing.

Another interesting future direction could be to investigate how the chance of being audited and penalized for accepting bribes affects decisions. Our investigation of bribery focused on the case in which the choice of a winner is subjective, which makes monitoring and punishment hard. Using decisions that are easily and objectively verifiable will make it possible to use the game in order to study the interplay between the probability of being caught and the size of the penalty, and how this interplay affects the decision to offer or accept a bribe.

Appendix A: Additional Regression Analysis

A.1. Moral Costs and the Role of Self-Serving Evaluations

In this section we supplement the results on moral costs (Section 3.3) with regression analysis. Specifically, in column (1) of Table A.1 we include data from all three moral costs treatments and treatment KeepWinner, and interact the quality and bribe variables with treatment dummies, using KeepWinner as the baseline. In column (2), we repeat this analysis using treatment KeepBoth as the baseline instead. We previously used this approach in Table 4 (column (3)) to compare KeepWinner to KeepBoth.

For treatment NoTask, the interaction terms suggest that bribe played a similar role as in treatment KeepWinner ($p = 0.892$), and a larger role than in treatment KeepBoth, albeit not significantly so using the wild bootstrap ($p = 0.146$). When we

TABLE A.1. Regression analysis for referees in NoTask, Objective, and KeepWinnerDelayed.

Dependent variable	Winner (1 = yes)	
	(1)	(2)
Bribe Difference	.331***	.110*
	(.000)	(.064)
Quality Difference (bribes differ)	−.016	.228***
	(.742)	(.000)
Quality Difference (bribes identical)	.184**	.290***
	(.022)	(.000)
D_{NoTask}	−.179	−.183*
	(.118)	(.098)
Bribe Difference × D_{NoTask}	−.026	.195
	(.892)	(.146)
$D_{\text{Objective}}$	.006	.002
	(.892)	(.948)
Bribe Difference × $D_{\text{Objective}}$	−.198**	.024
	(.030)	(.728)
Quality Difference × $D_{\text{Objective}}$	.241***	−.003
(bribes differ)	(.008)	(.976)
Quality Difference × $D_{\text{Objective}}$	.010	−.096
(bribes identical)	(.892)	(.370)
$D_{\text{KeepWinnerDelayed}}$	−.058	−.063
	(.404)	(.412)
Bribe Difference × $D_{\text{KeepWinnerDelayed}}$	−.169**	.052
	(.044)	(.496)
Quality Difference × $D_{\text{KeepWinnerDelayed}}$	.148*	−.096
(bribes differ)	(.060)	(.216)
Quality Difference × $D_{\text{KeepWinnerDelayed}}$	.159**	.054
(bribes identical)	(.014)	(.550)
Reference Treatment	KeepWinner	KeepBoth
Selected Workers	Random	Random
Observations	242	242
Clusters	121	121
R^2	.413	.295

Notes: OLS estimates (p-values). The dependent variable is a dummy that specifies whether the selected worker was chosen as the winner. D_{NoTask}, D_{NoTask}, and D_{NoTask}, are dummy variables equal to one for treatment NoTask, Objective, and KeepWinnerDelayed respectively, and zero otherwise. For other variable definitions, see Table 4 and its notes. We standardized the quality variable for treatment Objective to have the same mean and standard deviation as the quality variable in the other treatments. The two columns present comparison relative to treatment KeepWinner and treatment KeepBoth respectively. p-values are calculated using a wild bootstrap clustered at the referee level. For each regression, we randomly select one worker per referee in each round. *Significant at 10% level; **significant at 5% level; ***significant at 1% level.

redo Table A.1 using clustered standard errors and a nonparametric bootstrap (Online Appendix B.6), the latter coefficient is significant at the 10% level, which is in line with the nonparametric test.

As for treatment Objective, the regression shows that having a better performance mattered significantly more than in the KeepWinner treatment ($p = 0.008$), whereas

TABLE A.2. Regression analysis for the extra-laboratory experiment in India.

	Pineapple A wins (1 = yes)	
Dependent variable	(1)	(2)
Constant	.775	.750
	(.000)	(.000)
$D_{\text{KeepWinner}}$	−.425***	−.400***
	(.000)	(.008)
D_{KeepBoth}	−.100	−.050
	(.322)	(.730)
Pineapple A2/B2		.050
		(.712)
Pineapple A2/B2 × $D_{\text{KeepWinner}}$		−.050
		(.808)
Pineapple A2/B2 × D_{KeepBoth}		−.100
		(.624)
Observations	120	120
R^2	.137	.139

Notes: OLS estimates (p-values). The dependent variable is a dummy that specifies whether the referee selected the best-tasting pineapple (A) as the winner. $D_{\text{KeepWinner}}$ and D_{KeepBoth} are dummy variables that are equal to one for KeepWinner and KeepBoth, respectively, and zero otherwise. Pineapple A2/B2 is a dummy variable that is equal to one if the Pineapples tasted were Pineapple A2 and B2, and equal to zero if the pineapples tasted were A1 and B1. The Control treatment serves as the reference treatment. p-values are calculated using robust standard errors. ***Significant at 1% level.

having a higher bribe was less important ($p = 0.030$). The latter result is different from the nonparametric tests, where this comparison was not significant. Differences with respect to the KeepBoth treatment (column (2)) were not significant. When controlling for quality, bribes therefore appear to be less effective than in treatment KeepWinner, and as ineffective as in treatment KeepBoth. Overall, the regression results support the idea that moral costs are indeed higher when the objective nature of the task reduces the scope for self-serving evaluations.

Finally, the results for treatment KeepWinnerDelayed show that quality plays a larger role in this treatment than in KeepWinner ($p = 0.060$). Increases in the relative size of the bribes are less effective than in the KeepWinner treatment ($p = 0.044$). Relative to KeepBoth, increases in the relative size of bribes ($p = 0.496$) and quality ($p = 0.216$) have a similar effect. Overall, the regression results provide support for the idea that the KeepWinnerDelayed treatment reduced the scope for self-serving evaluations, increasing moral costs and lowering overall distortion.

A.2. The Extra-Laboratory Experiment

We further explore the results of the extra-laboratory experiment using regressions in which we estimate treatment effects on the probability of choosing the tastier pineapple (pineapple A). Since observations are not clustered, we use robust standard errors to

compute the p-values. The regression (Table A.2, column (1)) confirms that participants in KeepWinner were significantly less likely to choose the tastier pineapple than participants in the Control treatment. Participants in KeepBoth were not significantly less likely to choose the tastier pineapple than participants in the Control treatment. The difference between the KeepWinner and the KeepBoth coefficients is also significant ($F(1117) = 9.22$, $p = 0.003$). In column (2), we interact the particular pineapple that was tasted by the subjects with treatment dummies. We find that the treatment effect is similar regardless of the particular combination of pineapples that was tasted.

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Supplementary Data

Supplementary data are available at *JEEA* online.