# Corruption: a Cross-Country Comparison of Contagion and Conformism.*

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**Abstract**

For successful anti-corruption policies, it is crucial to understand the basic social contract governing the interaction between people. Social norms are a key element of the social contract, but may vary across cultures. We investigate how prescriptive and descriptive social norms affect the development of corruption over time. In a laboratory experiment implemented in the Netherlands, Russia, Italy, and China we study a corruption game that is based on a real-effort task. In separate sessions, we elicit existing prescriptive corruption norms. To induce natural variation in descriptive norms, we vary the type of information about others' choices. Such information may lead to 'contagion' -where corruption increases in response to observing high corruption by others- or 'conformism' -where it decreases when low corruption by others is observed. Our results show evidence of contagion. We investigate how this interacts with differences in prescriptive norms. The findings suggest that the two types of norms work as complements, not substitutes.

*Keywords:* corruption, bribery, laboratory experiments, contagion effect, conformism effect.
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# 1 Introduction

Corruption is one of the most significant problems the world economy faces (Köbis et al. 2019). It is a widespread phenomenon, affecting every country across the globe. According to IMF estimates (IMF 2016), the costs of bribery amount to 2% of the global GDP. While some researchers argue that corruption might increase efficiency (the "greasing the wheels" effect, Lui 1985), most conclude that corruption has a negative effect on economic growth and development because it increases inequality (Gyimah-Brempong 2002, Policardo and Carrera 2018) and poverty (Gupta et al. 1998, Negin et al. 2010), reduces investments (Wei 2000) and has a deleterious effect on the allocation of government expenditure (Mauro 1997) and government debt (Cooray et al. 2017).

Attention for corruption and anticorruption policies has increased dramatically in recent decades, but in practice the results of these policies appear unimpressive. Some researchers argue that "decision-makers should focus on policies that change the basic social contract, instead of relying solely on measures that are intended to change incentives for corrupt actors" (Rothstein 2018: 35). To achieve this, it is very important to understand how citizens perceive corruption and whether it is seen as a violation of social norms, because social norms may be at the core of any social contract. This paper is an attempt to contribute to this understanding.[1]

We hope to contribute to this literature by studying the role of norms in corruptive behavior. A better understanding of this role might suggest alternative channels to govern corruption (Hauk and Saez-Marti 2002). We investigate what we call a 'contagion effect' and a 'conformism effect'. If an individual sees that corruption is common amongst her peers, then she might consider acting corruptly herself to be morally acceptable. In this way, corruption is 'contagious'. In contrast, a corrupt-acting individual who sees that corruption is rare amongst her peers may conclude that it is deemed unacceptable and 'conform' to the more acceptable non-corrupt behavior. We thus investigate whether corrupt behavior by an individual is sensitive to the disclosure of information about such choices by others. Indeed, Köbis et al. (2015) provide evidence that information about others' corruptive behavior affects one's own decisions. Such information constitutes a 'descriptive norm'. We will discuss below the important differences between the Köbis et al. (2015) study and ours.

Contagion and conformism affect the development of behavior over time, which may or may not converge. If the extent of corruption converges, the level to which it does so may depend crucially on the environment in which it takes place. In particular, such dynamics may vary

[1]For successful policy, it is also important to understand whether and how people respond to the damage that their corruptive choices may cause to third parties and how such responses are affected by norms. Many find that negative externalities have no apparent effect (Abbink et al. 2002, Schulze and Franck 2003, Cameron et al. 2009b, Serra 2011), while others find the opposite (Barr and Serra 2009 Senci et al. 2019). With social preferences punitive policies may not be the most efficient path to follow (Armantier and Boly 2011). As a case in point, consider China, which remains one of the most corrupt countries in the world, despite the existence of the death penalty for some types of corruption (Zhu 2015). Similarly, it is important to understand the effects of norms on positive externalities. For example, some might act dishonestly if others benefit from this behavior (Weisel and Shalvi 2015). Both types of externalities, and the role of norms therein, are beyond the scope of this paper.

across countries. In various cultures, distinct 'prescriptive' social norms may exist, prescribing the extent to which corruptive choices are deemed (in)appropriate. Such prescriptive norms may interact with the descriptive norms, i.e, with the information individuals have about others' corrupt choices.[2] The interaction between prescriptive and descriptive norms may strongly affect the dynamics of corrupt behavior (Bicchieri and Fukui 1999). In fact, we would argue that this interaction is at the core of the 'basic social contract' and may therefore strongly impact corrupt behavior and the success of anti-corruption policies. The interaction may work in either of two ways. First, the two norm types might be substitutes. If this is the case, then strong prescriptive norms will prevent descriptive norms from affecting behavior and, vice versa, descriptive norms are expected to be important in the absence of prescriptive norms. On the other hand, if the two types of norms are complements then descriptive norms will develop and affect behavior in support of existing prescriptive norms.

To study this, we use laboratory experiments. When comparing behavior across countries one needs to account for a plethora of differences in culture and institutions that might affect this behavior. The laboratory offers a unique environment to hold constant the many institutions that might differ and measure specific aspects of culture such as the relevant prescriptive norms. This allows us to correct for many of the confounds and focus primarily on what we are interested in: corrupt behavior by individuals and its relation to social norms.[3] We conduct a series of experiments in the Netherlands, Russia, Italy and China. As explained below, this allows us to collect data about the norms and behavior of people coming from societies with different perceptions of corruption.

We study corrupt behavior by applying the real-effort corruption game developed by Zheng et al. (2020). This builds on the paradigm introduced by Gneezy et al. (2019). We use a real-effort task as opposed to chosen effort because real effort allows for an objective measure of performance. Two performers of this task are grouped with a judge. We change the composition of groups between periods, in order to avoid long-run reciprocal relationships. The judge is informed about the performers' scores on the task and must allocate a prize to one of the two. In the main treatment, performers may transfer money to the judge before she decides. This is interpreted as a bribe. If the judge allocates the prize to a performer who performed worse but bribed more, we interpret this as corruption.[4] To allow for descriptive norms to develop, the type of information about others' choices is varied. Either performers learn only the bribe choices of the other performers with whom they were grouped (a low-information treatment) or they learn the bribe choices of a much larger set of performers (high information). Finally, we

[2]The distinction between these two types of norm is important (Bicchieri 2005; Brennan et al. 2013). Prescriptive (a.k.a. 'injunctive', or 'moral') norms prescribe what one 'ought to do', while descriptive norms, or 'norms as social practice', describe how things are usually done in a group, organization or society.

[3]We will discuss possible disadvantages to the use of experiments and related next steps in the concluding discussion.

[4]The judge receives both bribes in any case and in the subsequent period she plays with other bribers, thus there is no material gain for her to behave dishonestly.

use separate sessions in each country and apply the elicitation method in Krupka and Weber (2013) to obtain information about existing prescriptive norms with respect to corrupt behavior.

In the data pooled across all countries, we observe strong evidence of contagion, but little conformism. Performers strongly and significantly adjust their bribes upward if they observe that others are bribing more. There are, however, noticeable differences across countries. Contagion appears to be stronger in Russia and Italy than in the Netherlands and China. The prescriptive norms concerning bribers' and judges' behaviors also differ across the subject pools. For example, while in China and the Netherlands it is considered highly socially inappropriate to bribe and, if you are a decision maker, to treat unfavorably 'deserving' people (i.e., those with higher performance and lower bribes), in Italy the norms are the opposite. Russia takes an intermediate position in this respect. Together, our results suggest that prescriptive and descriptive norms are complements, rather than substitutes.

Our results are important, because a proper understanding of the interaction between prescriptive and descriptive norms is crucial for the development of successful anti-corruption policies. The potential for such policies is discussed in our concluding discussion. The remainder of this paper is structured as follows. Section 2 provides a brief discussion of the state of the art in the related literature. Section 3 presents the experimental design and procedures, Section 4 describes and discusses the results, while Section 5 offers a concluding discussion.

## 2 State of the Art

Social norms are unwritten rules that guide human activities within a society; they are "the standards of behavior that are based on widely shared beliefs how individual group members ought to behave in a given situation" (Fehr and Fischbacher 2004). While prescriptive norms or 'normative expectations' (Bicchieri 2005) indicate what one "ought to do" in a given social context, descriptive norms describe what a majority of group members are likely to do. Studies in social psychology have shed light on the "spreading of disorder" in rule violations (Keizer et al. 2008); this is an example of the effects that descriptive norms may have.[5] More recent research takes this one step further and studies the psychological mechanisms that are involved in the influence of descriptive and prescriptive social norms on corruptive behavior (Köbis et al. 2015; Shalvi et al. 2015; Guerra and Zhuravleva 2019; Guerra and Zhuravleva 2020).

In terms of the research questions asked, Köbis et al. (2015) is perhaps the study closest to ours. They present three experiments. In the first two, they show that perceived descriptive norms about corruptive behavior correlate with corrupt decisions. In the third, they show that there is a causal link from such norms to corrupt choices. An important difference with our study is that we collect data in four different countries, across which existing prescriptive

[5]For descriptive norms to have such effects, people must prefer to act in accordance with the norm conditional on their empirical expectations (Bicchieri 2005). In this paper, we assume this to be the case.

norms may substantially differ. In addition, there are important methodological differences between the Köbis et al. (2015) study and ours. Their study creates a hypothetical situation ('inviting a minister on a holiday') and provides no choice-based incentives. In addition, they use deception. In contrast, we apply the standard methods of experimental economics by creating a real economic environment with incentivized decisions.

Recent studies from the laboratory show that descriptive norms may have direct effects on bribery behavior. Abbink et al. (2018) use a sequential bribery game to isolate the effects of descriptive social norms on bribe offers. In the first stage, a public official decides whether or not to accept a bribe from a firm; based on corrupt decisions of the officials, different official-firm pairs are formed. The effect of descriptive norms on bribe offers is clear; once a firm is paired with a corrupt official the bribes are more than doubled compared to when the firm is paired with an honest official. In addition, this effect persists independently of the sanctioning environment. Note that a different kind of descriptive norm is used by Abbink et al. (2018) than by us. Whereas they consider the effects of norms regarding bribees' behavior on bribers' choices, we consider norms relating to the bribers themselves. We will see, however, that our results do include a 'mirror image' of this finding; when our judges (bribees) are informed about the extent of bribing, they tend to make more corrupt choices.

Prescriptive norms are generally assumed to be much more stable than descriptive norms. Some have argued that beliefs and values are transmitted in a slow-moving process from generation to generation onto economic outcomes as part of the impact of culture (Guiso et al. 2006), so that corrupt behavior can be predicted by the prevailing social norms in a country. Fisman and Miguel (2007) use empirical data of diplomats from 149 countries in New York and find that diplomats from high-corruption countries accumulate significantly more unpaid parking violations than those from other countries. Gächter and Schulz (2016) use controlled experiments from 23 countries to demonstrate a robust link between social norms and individual's intrinsic honesty. The authors build an index of "prevalence of rule violations (PRV)" (including tax evasion, corruption and political fraud) for each country and relate it to the results in a die-rolling experiment. They find that subjects from low-PRV value countries are less likely to lie in the experiment than those from high-PRV countries. Such results have motivated us to include the norm-measurement sessions in our experiment. We hope, however, to add to the literature not only by studying the effects of prescriptive norms on corrupt behavior, but also by investigating the interaction between prescriptive and descriptive norms in these effects.

In spite of this growing literature, evidence remains mixed as to the effects of social norms on corrupt behavior. To begin with, such effects appear to be sensitive to specific microcultures. By conducting controlled experiments among employees from a large, international bank, Cohn et al. (2014) show that making the professional identity as bank employees salient increases dishonesty. Similar results are found in Rahwan et al. (2019). These effects are not observed in other industries or among students that are primed with bank-related items. This suggests that a specific business culture in banks has a strong effect on corruptive choices, which may interact with prescriptive norms that are active in the (macro-)culture where a bank is located.

Finally, cross-country comparisons produce inconclusive results about the effects of social norms on corruption. Various studies apply bribery games in different countries (Alatas et al. 2009, Cameron et al. 2009a, Banuri and Eckel 2012a, Banuri and Eckel 2015, and Frank et al. 2015). Others conduct the game with subjects from different countries (Barr and Serra 2010). For more examples, see Banuri and Eckel (2012b). By and large, results show that distinct social norms alone cannot perfectly predict corrupt behavior. Other elements such as institutional changes, gender, or group composition may play a role. In our analysis, we will correct for such factors. Most importantly, however, we will allow for effects of both prescriptive and descriptive norms and of their interaction. To the best of our knowledge, we are the first to do so.

# 3 Experimental design

There are two types of sessions in each country. In one, participants play the 'corruption game' described below. In this game, we varied the possibility for descriptive norms to develop. In the second type, we measured existing prescriptive norms. We first describe the corruption game.

## 3.1 Corruption game

**General setup**

This corruption game was developed in Zheng et al. (2020), building on Gneezy et al. (2019). There are two roles in the experiment: performers, and judges. Upon arrival in the laboratory, subjects are randomly assigned one of these, which remains fixed throughout the experiment. They subsequently play ten periods of the game described below. In each period they are (re)matched in groups of three, consisting of one judge and two performers.[6] After ten periods of the task, subjects are asked to fill out a questionnaire with personal characteristics such as age, gender, educational background, and height; we also collect risk attitude, life satisfaction and other subjective information.[7] At the end of the experiment, one period is randomly chosen for payment.

At the beginning of each period each subject receives an initial endowment of ten experimental tokens. Each period subsequently consists of three stages. At the first stage, the two performers in a group each and independently carry out the real-effort task explained below. At stage two, performers have an opportunity to transfer money to the judge (out of their ten-token

[6]Rematching takes place within a matching group of 12 subjects, with two matching groups per session. An exception is Russia, where the size of the laboratory only allows for one matching group per session.

[7]See appendix A for more details and instructions.

endowment). We interpret any money transferred as a bribe. All bribe transfers are irrevocable; the judge keeps bribes from both performers irrespective of her subsequent decision. At stage three, the judge chooses a 'winner' from the two performers. This winner receives a ten-token prize, which is irrelevant for the judge's payoff.

### Real-effort task

We use the real-effort task developed by Weber and Schram (2016). On their computer monitor, performers see two 10 by 10 matrices filled with two-digit numbers. Their task is to find the largest number in each of the two matrices and add them up (see Figure 1 for an illustration). After entering a number, a new set of randomly chosen matrices appears on the next screen, irrespective of whether the number entered was correct or not. This is an individual task and each performer has five minutes to solve as many of these matrix summations as they can. Each correct answer adds one point to the performer's total score. On the monitor, performers can see the remaining time and also the number of attempts and correct trials. At this stage the judge waits.

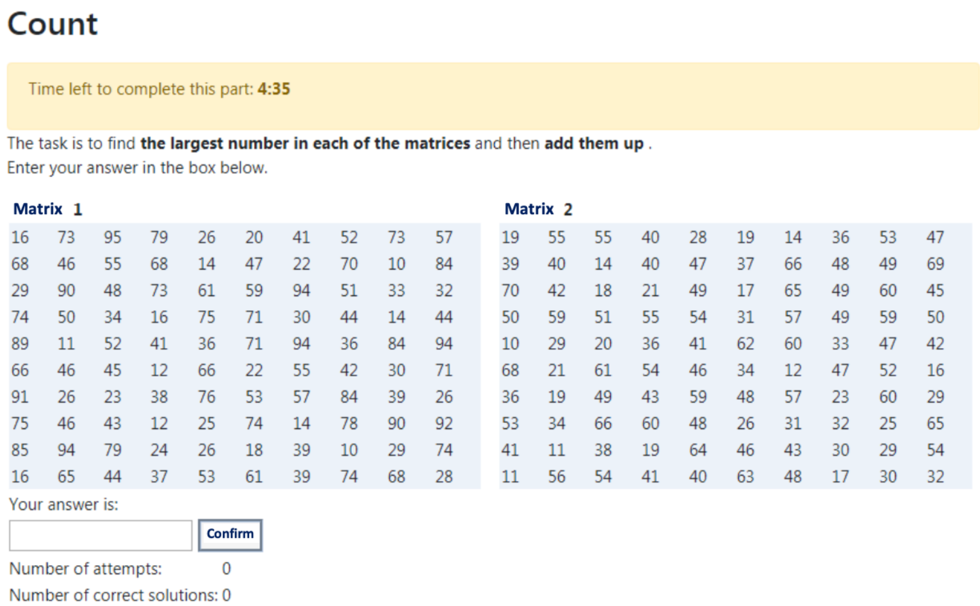



Figure 1: **Real effort task.**

### Bribes and prize allocation

At the second stage, each performer is informed of her number of correct answers. Then she decides how many tokens (from 0 to 10) to transfer to the judge. Performers are informed that the transfer is nonrefundable and it does not guarantee them winning a prize. We denote performers $i$ and $j$'s performance by $P_i$ and $P_j$, and their transfers to the judge by $B_i$ and $B_j$, respectively. The judge remains inactive at this stage. Performers only know their own performance and transfer amounts.

At the third stage, the judge is informed about both performers' scores and transfers. That is, she knows $P_i$, $P_j$, $B_i$, and $B_j$. The judge then nominates and awards ten tokens to the winner. Zheng et al. (2020) show for an experiment run in Amsterdam, that in the absence of the possibility to bribe (and in the absence of social ties between the judge and performers) a very large majority of judges allocate the prize to the performer with the higher score. This suggests that the prize is seen as a reward for performance, even though it is never explicitly stated that this is so.

**Treatments**

We adopt a 4×2 full-factorial between-subject design. The treatment dimensions vary in which country subjects are living in and how much information (about other performers' bribes) they are provided with during the experiment. The countries we distinguish between are The Netherlands (*NL*), Russia (*RS*), Italy (*IT*) and China (*CH*). The information level can be either low (*LI*) or high (*HI*). In *LI*, only information about decisions in one's own three-person group is provided. After the judge's decision is made, participants are told $P_i$, $P_j$, $B_i$, and $B_j$ and who is the winner. A performer is therefore only informed about the other performer's score and transfer to the judge, as well as the judge's decision in that period. Because of the strangers' environment that we use, information about others' behavior gradually accumulates across periods. Participants in the high-information treatment (*HI*) are also informed about $P_i$, $P_j$, $B_i$, and $B_j$, and the judge's decision. In addition, they are informed of the average bribe in their matching group (recall that there are 12 participants in each matching group)[8]. This latter information is provided by way of a pop-up message that appears on each performer's and on the judge's monitor: *"This period, the average amount transferred per person to the judge is ... points"*. Each subject has to confirm this message before she can proceed to the next period.

**Players' payoffs**

Let $i$ be the performer to whom the judge awards the prize and $j$ the other performer. The monetary payoffs in any given period are then:

$$\begin{aligned} \pi_i &= 20 - B_i \\ \pi_j &= 10 - B_j \\ \pi_{judge} &= 10 + B_i + B_j \end{aligned} \tag{1}$$

[8]Due to an organizational error, one of the matching groups in Russia consisted of 15 participants.

All players are paid for one randomly selected period. In addition, each participant receives a participation fee. This was 7 euros in *NL*, 150 RuR (∼2.1 euros) in *RS*, 5 euros in *IT*, and 15 yuan in *CH* (∼2 euros). These participation fees were chosen in accordance with the standards of the laboratories concerned.

### 3.2 Social norm sessions

To measure prescriptive norms in each country we apply the incentivized elicitation method introduced by Krupka and Weber (2013). We do so in a separate session using different participants from the same subject pool in each country.[9] The method uses a coordination game to reveal the collective perception regarding the appropriateness of different types of behavior. We provide participants with a set of scenarios for the corruption game (varying performance, bribes, and the judge's decision) and ask them what they think about the appropriateness of each scenario. Participants are incentivized to match the modal response provided by the majority of others rating the same scenario. Varying the scenarios allows us to identify in each country prescriptive social norms that govern bribe-giving and bribe-taking behavior.

Similar to Krupka and Weber (2013), we measure the extent to which a certain behavior is considered socially appropriate or inappropriate by asking respondents about their ratings of the behavior as being "very socially inappropriate", "somewhat socially inappropriate", "somewhat socially appropriate", or "very socially appropriate". In our implementation, one scenario is randomly selected and a participant receives a payment if she chooses the modal response for that scenario; otherwise, she receives only the participation fee.

We distinguish between seventeen hypothetical scenarios (see appendix B), which are presented to participants in three sets of four scenarios and one set of five scenarios. These sets are presented in random order. To elicit norms concerning bribing behavior, we first posit an average score for the task. We then consider an environment where a hypothetical performer has a score below, equal to, or above this average. For each of these scores, we consider bribes of 0, 3, or 7 tokens. This results in nine different situations for which our subjects need to rate the appropriateness of the bribe. Next, we ask subjects to evaluate a hypothetical judge's decision for distinct environments. We posit one performer with an average score and the other with an above-average score. We consider two sets of bribe levels (7 - 3, and 3 - 0). Then we consider the judge allocating the prize to either player. This allows us to distinguish between the judge nominating (1) a player with a higher score and a higher bribe than the other, (2) a higher score and a lower bribe; (3) a lower score and a higher bribe; or a (4) a lower score and a lower bribe. We do so for each of the two sets of bribes, giving eight scenarios.

After subjects have indicated social appropriateness ratings for all 17 scenarios, one is randomly selected for payment. The experimenter computes the modal response for this scenario

[9] Instructions for these sessions are presented in appendix B.

and pays every respondent with this answer 10 euros in Italy and the Netherlands, 500 RuR in Russia (∼6.5 euros) and 30 yuan in China (∼4 euros).

### 3.3 Procedures

The experiment was run at the the BLESS laboratory at the University of Bologna in Italy in June 2018, the CREED laboratory of the University of Amsterdam in the Netherlands in September 2018, the CBER laboratory at Wuhan University in China in September 2018, and at the Higher School of Economics in Moscow, Russia, in April 2018 and September 2019. In all countries, we apply the same experimental instruction and protocol.[10] Tokens are exchanged for the local currency of the country concerned.The exchange rate was 1 token=1 euro in Amsterdam and Bologna, 1 token = 50 RuR (∼0.65 euro) in Moscow, and 1 token = 3 yuan (∼0.4 euro) in Wuhan.

In *NL*, *IT*, and *CH*, there were three sessions of *LI*, three sessions of *HI* and one social norm session. Each session of *LI* and *HI* consisted of 24 participants and was divided into two matching groups. The number of participants in the social norm sessions was 39, 40, and 40 in *NL*, *IT*, and *CH*, respectively. As mentioned earlier, the laboratory size in Moscow does not allow for 24 participants, so we had six sessions each for *LI* and *HI*, one of which had 15 participants instead of 12 (see footnote 8). Here, the social norm session consisted of 32 participants. In total we thus had 579 participants for the corruption game and 151 participants for the social norm sessions.

Our post-experimental survey shows that subjects are mainly college students in the 18-24 age range.[11] The fraction of females is close to 50% in all countries except $CH$, where it is approximately 65%. The fraction of participants with a major in economics or business varies more across subject pools. It is highest (60%) in $CH$ and lowest (30%) in $IT$. We also have information about participants' self-reported risk attitudes, income, life satisfaction, and trust. There is limited variation in these variables across subject pools, but we will correct for such differences in our regression analyses below. Finally, the cultural background of our participants varies across countries. All participants in $RS$ are Russian, those in in $IT$ are Italian, and all $CH$ are Chinese. In $NL$, participants' cultural background is mixed; 33% are Dutch, 14% come from the other parts of Western Europe, 17% from Italy, and 10% from China.

Descriptive norm sessions lasted approximately 1.5 hours and the average earnings including show-up fee were 20.3 euro in Amsterdam, 950 RuR (∼13.3 euro) in Moscow, 18.3 euro in Bologna, and 55 yuan (∼7 euro) in Wuhan. Prescriptive norm session lasted approximately 1 hour. In $NL$ 18 people out of 39 correctly guessed the modal response (yielding average earnings

[10] Languages in the instructions are English in Amsterdam, Russian in Moscow, Italian in Bologna, and Chinese in Wuhan. Some of the sessions in Moscow had to be postponed until September 2019 due to logistical reasons. These sessions were run precisely as originally planned and with the same subject pool.

[11] See appendix C for the questions asked in the survey and appendix D for the descriptive statistics.

of 11.6 euro); this was 16 out of 32 in *RS* (400 RuR), 12 out of 40 in *IT* (8 euro), and 20 out of 40 in *CH* (42.5 yuan).

### 3.4 Hypotheses

We start with the effects of prescriptive norms. In a way, these define the point of departure for the subjects in various countries. To predict cross-country differences in prescriptive social norms, we compare measures of actual corruption in each. The Transparency International corruption index 2018 measures perceptions by experts and businesspeople about the corruption in 180 countries around the world.[12] Corruption is indexed between 0 (highly corrupt) and 100 (not corrupt). The average value across countries in 2018 was 43. Ordering the four countries of our experiment from high corruption to low corruption gives Russia (28), China (39), Italy (52) and the Netherlands (82). We predict a positive correlation between on the one hand the extent of corruption and on the other hand the perceived appropriateness of bribes or corruption. This yields our first Hypothesis.

Hypothesis 1: Prescriptive norms

1a: Bribing is considered most appropriate in Russia, followed by China, Italy, and the Netherlands.
1b: Corruption is considered most appropriate in Russia, followed by China, Italy, and the Netherlands.

For the effects of descriptive norms, we focus on bribery, because the information we vary across treatments is about others' bribes.[13] As mentioned above, we distinguish between *Contagion* and *Conformism.* Contagion refers to a situation where observed high levels of bribes make bribing 'acceptable'. As a consequence, a decision maker observing that others bribe more than she does will subsequently increase her bribes. Conformism refers to the reverse; someone who observes that others are bribing less than she is will subsequently diminish her bribes. Of course, contagion and conformism may well exist simultaneously. In fact, we hypothesize that both exist. Intuitively, we do predict that information based on the larger group in *HI* has a stronger effect than the pairwise information in *LI.*

Hypothesis 2: Contagion

The disclosure of information about average bribes leads performers to bribe more if this average is above their own previous bribe level. This effect is stronger in the treatment with information

[12] See https://www.transparency.org/cpi2018.

[13] We could have, of course, provided information about judges' decisions at the matching-group level, but this would require much more detail than a simple average.

at the level of the matching group.

Hypothesis 3: Conformism

The disclosure of information about average bribes leads performers to bribe less if this average is below their own previous bribe level. This effect is stronger in the treatment with information at the level of the matching group.

Finally, we consider the interaction between prescriptive and descriptive norms.[14] We hypothesize two effects. First, we predict that in early periods contagion and conformism will be less prominent in countries with strong prescriptive norms against corruption than in countries with weak prescriptive norms. Second, we assume that over time, as information about others' choices accumulates, cross-country differences caused by prescriptive norms diminish. This will reduce differences in bribes and in judges' corruption. This means that we are assuming that the two types of norms are substitutes (and not complements). We believe this to be the more intuitive case. This yields our final two hypotheses.

Hypothesis 4: The strength of descriptive norms

In early periods, Contagion and Conformism are stronger, the weaker are the prescriptive norms in a society.

Hypothesis 5: The strength of prescriptive norms

Cross-country differences in bribes and judges' corruption decrease across periods.

## 4 Results

We ask three groups of questions. First, are there systematic differences in prescriptive norms as measured in each country? This allows us to address Hypothesis 1. Second, we analyze how bribes are affected by information about others' choices. That is, we investigate contagion and conformism and test hypotheses 2 and 3. Finally, a further analysis of the results per country and a closer look at judges' behavior allows us to test Hypotheses 4 and 5 on the interaction between the two types of norms. Unless indicated otherwise, test results are based on permutation t-tests

[14]When deriving Hypothesis 1, we assumed that actual corruption in any country is correlated with the prevailing prescriptive social norms. Of course, it is likely also to be affected by the institutions that are in place in a country (Gërxhani and Wintrobe 2021). This makes corruption a noisy predictor of these norms. When hypothesizing about the interaction between prescriptive and descriptive norms, we therefore use the measured prescriptive norms as point of departure.

(henceforth, PtT), with 10,000 permutations.[15]

### 4.1 Prescriptive norms

To analyze subjects' choices in the Krupka-Weber coordination games, we first convert their responses to a numerical index. Following Krupka and Weber (2013), a rating of "very socially inappropriate" is given a score of -1, "somewhat socially inappropriate" a score of $-\frac{1}{3}$, "somewhat socially appropriate" a score of $\frac{1}{3}$, and "very socially appropriate" a score of 1.[16] We thus arrive at an index that varies from -1 (very socially inappropriate) to 1 (very socially appropriate).

As explained above, when eliciting prescriptive norms, we did so for the case without a bribe and for two additional bribe levels. We did each for a low, average and high performance level. We are interested in how the participants in various countries view the appropriateness of bribes in comparison to the no-bribe case. For this purpose, we first normalize the appropriateness index for the no-bribe scenario in each country and at each performance level to 0.[17] The normalized index for a bribe thus represents how appropriate participants in that country consider that bribe by a person with a specific performance level compared to that person not giving a bribe. Finally, to obtain a measure across all performance levels we simply take the average across the six normalized indices per country. These averages are given in the row 'Bribes' of Table 1.

Table 1: Prescriptive Norms

| | $NL$ | $RS$ | $IT$ | $CH$ |
|---|---|---|---|---|
| Bribes | $-0.30$ | $-0.09$ | 0.03 | $-0.34$ |
| Judges' Corruption | $-0.18$ | $-0.28$ | 0.14 | $-0.46$ |

*Notes*: 'Bribes' gives the average normalized appropriateness index for bribing. 'Judges Corruption' gives the average appropriateness index of giving the prize to the poorer performer if she bribes more. The main text explains how these are calculated. A negative number indicates inappropriateness.

This measure of the appropriateness of bribes shows that bribing is deemed most inappropriate in $CH$, followed by $NL$, $RS$, and $IT$. This is a different order than predicted by Hypothesis 1a. We therefore find no support for this hypothesis. In fact, testing pairwise differences shows that prescriptive norms in $IT$ are significantly more lenient towards bribes than in any of the other three countries (PtT, all $p < 0.01$). Pairwise differences between the other three countries are all statistically insignificant (PtT, all $p > 0.32$). The norms about bribes in $NL$ and $IT$ are more or less as expected. We had predicted $RS$ to be more lenient towards bribes than $IT$, but this is rejected by our data. The strongest deviation form the prediction is the position of $CH$. Given the high level of perceived corruption in China mentioned above, the anti-bribe norms for

[15] See Moir (1998) or Schram et al. (2019) for discussions of the PtT and its advantages.

[16] The precise conversion used is somewhat arbitrary, of course. Our conclusions do not change if we score the 'somewhat' categories as $-\frac{1}{2}$ and $\frac{1}{2}$.

[17] An overview of all indices and normalized indices is given in appendix E.

*CH* come as a surprise. We will return to this issue in the concluding discussion.

We now turn to prescriptive norms concerning judge's behavior.[18] Appendix E presents these norms for all cases distinguished in the social norm measurement sessions. To test Hypothesis 1b, we need a measure of judges' corruption. We consider a judge to be corrupt if she awards the prize to B when (i) A has the better performance, and (ii) B bribes more than A. This occurs in two of the cases we presented in our social norm measurement sessions. As a measure of the prescriptive norm with respect to judges' corruption, we take the average appropriateness of these two indices. The anti-corruption norm is given in the row 'Judges' Corruption' in Table 1.

A corrupted judge decision is deemed most inappropriate in *CH*, followed by *RS*, *NL*, and *IT*, where is is considered appropriate. This order is again different than hypothesized, so we find no support of Hypothesis 1b. Once again, *NL* and *IT* respond as expected. Now, not only *CH*, but also *RS* has a strong anti-corruption norm. Both have a significantly lower index than *IT* (PtT, both $p < 0.04$). All other pairwise comparisons are statistically insignificant (PtT, all $p > 0.11$). Though the results for *RS* and *CH* may be surprising in terms of the hypothesis, it might be explained by the observation that people in countries with high corruption are confronted most often with the consequences thereof (Gatti et al. 2003; Smith 2008).

Comparing the two rows of Table 1 shows that the Chinese have the strongest prescriptive norms against bribes and corruption, while the Italians are most tolerant. The Dutch and the Russians are in between these two extremes, with the Dutch having stronger norms against bribes and the Russians against corruption. We will use these ordinal rankings when testing Hypotheses 4 and 5.

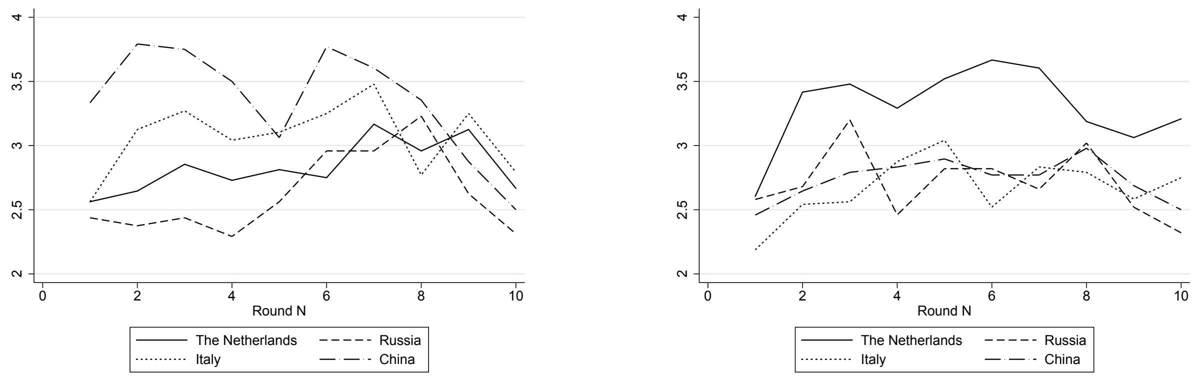
### 4.2 Bribes

#### Overview

Next, we consider bribes, and how they are affected by descriptive norms. Figure 2 shows the average bribes per period separately per country and information treatment. We observe that the mean bribe lies between 2 and 4 (out of 10) tokens in both treatments and all countries. Moreover, no general trend across periods is discernible. In the left panel of Figure 2 (the *LI* treatment) *CH* stands out with higher bribes, though bribes do decrease in the final four periods. The other countries appear to be comparable. In *HI*, it is *NL* that stands out with higher average bribes than in other countries. Permutation t-tests show that none of the pairwise differences in either panel, however, are significant at the 10% level (cf. Table 2).[19] This in itself is not

[18]Note that there is no straightforward way in which to normalize these norms for judges like we did for performers.

[19]To account for interactions across periods, we use the matching group as the unit of observation for these tests.




(a) LI (b) HI

Figure 2: Bribes over 10 periods

surprising, because the averages across all periods are influence by prescriptive and descriptive norms, and their interaction. We have no hypotheses about this aggregate effect.

Table 2: P-values for permutation tests of bribes between two countries

| | $NL - RS$ | $NL - IT$ | $NL - CH$ | $RS - IT$ | $RS - CH$ | $IT - CH$ |
|---|---|---|---|---|---|---|
| $LI$ | 0.799 | 0.699 | 0.344 | 0.576 | 0.353 | 0.562 |
| $HI$ | 0.266 | 0.147 | 0.185 | 0.933 | 0.961 | 0.867 |
| period 1 | 0.829 | 0.494 | 0.332 | 0.634 | 0.211 | 0.069 |

*Notes*: Cells report p-values of permutation t-tests with 10000 permutations for the mean bribe comparison indicated in the first row. For $LI$ and $HI$, mean bribes per matching group are the unit of observation ($N = 12$ in all cases). For *period* 1, individual bribes are the unit of observation and $N = 96$ in $NL$, $IT$, $CH$; $N = 98$ in $RS$.

Decisions in period 1 cannot be influenced by descriptive norms since no information about others' choices has yet been disseminated. For this reason, we can pool in each country the observations for $LI$ and $HI$. Any differences in period 1 bribes can then be attributed to distinct prescriptive norms. In addition, there has not been any interaction when performers decide on bribes in period 1, so their decisions may be considered as statistically independent. Average bribes in period 1 are 2.6 in $NL$; 2.5 in $RS$, 2.4 in $IT$, and 2.9 in $CH$. The lower panel of Table 2 shows that all pairwise differences are statistically insignificant except that period 1 bribes in $CH$ are marginally significantly higher than in $IT$ and $CH$. We conclude that prescriptive norms play only a minor role in period 1 bribes.[20]

### Regression model

Our experiment allows us to identify how information about prevailing bribes affects performers' bribes in subsequent periods through the spread of descriptive norms. Specifically, we will

[20]Recall from Table 1 that prescriptive norms against bribes are much stronger in $CH$ than in $IT$. Here we observe that first-period bribes are higher in $CH$.

analyze whether a player increases her bribe when she sees that her transfer is below the average bribe that she is informed of (the 'contagion' effect of information) and whether she reduces her bribe when she is informed that she has bribed more than others (the 'conformism' effect of information).

We adopt an OLS model for this analysis. The dependent variable is performer $i$'s change in bribes between two periods, $\Delta B_t^i = B_t^i - B_{t-1}^i$ (thus defined to be positive for an increase). The independent variables are the following.

(i) The difference between $i$'s own and her competitor's bribe in the previous period. This difference is denoted by $D_{j,t-1}^i$. We distinguish between $D_{<j,t-1}^i$ for cases when $i$'s bribe is less than her competitor's and $D_{>j,t-1}^i$ if she bribes more. Formally,

$$D_{<j,t-1}^i = \begin{cases} B_{t-1}^j - B_{t-1}^i, & \text{if } B_{t-1}^j \geq B_{t-1}^i \\ 0, & \text{otherwise} \end{cases}$$

$$D_{>j,t-1}^i = \begin{cases} B_{t-1}^i - B_{t-1}^j, & \text{if } B_{t-1}^j < B_{t-1}^i \\ 0, & \text{otherwise} \end{cases}.$$

(ii) The difference between $i$'s own bribe and the average bribe in the matching-group in the previous period. This is denoted by $D_{A,t-1}^i$. We distinguish between whether $i$'s bribe is less than or more than the matching group, denoted by $D_{<A,t-1}^i$ and $D_{>A,t-1}^i$, respectively. Denoting the average previous bribe in the matching group by $A_{t-1}$,

$$D_{<A,t-1}^i = \begin{cases} A_{t-1} - B_{t-1}^i, & \text{if } A_{t-1} \geq B_{t-1}^i \\ 0, & \text{otherwise} \end{cases}$$

$$D_{>A,t-1}^i = \begin{cases} B_{t-1}^i - A_{t-1}, & \text{if } A_{t-1} < B_{t-1}^i \\ 0, & \text{otherwise} \end{cases}.$$

Because -by design- participants in *LI* have no information about other bribes in the matching group, $D_{<A,t-1}^i$ and $D_{>A,t-1}^i$ are both set to 0 in *LI*.

(iii) A dummy variable $T$, equal to 1 for the *HI* treatment, and 0, otherwise.

(iv) A dummy variable $Unfair_{t-1}^i$, equal to 1 if the judge in the previous period allocated the prize to the performer with a lower performance and a higher bribe, and 0 otherwise. This allows us to capture possible influences of having experienced unfair judgement in the previous period.

(v) A control variable $P^i_{t-1}$, capturing $i$'s previous performance as well as a series of personal characteristics $C^i_k$, including age, gender, educational background, nationality, field of study, financial situation, and risk attitude.[21]

Since the competitor's bribe information is available in both *LI* and *HI*, we add the interaction terms $D^i_{<j,t-1} * T$ and $D^i_{>j,t-1} * T$ to allow the effect of knowing the competitor's bribe to vary between the two treatments.

Together, this gives regression equation 2.

$$\begin{aligned}\Delta B^i_t = \beta_o + \beta_1 * D^i_{<A,t-1} + \beta_2 * D^i_{>A,t-1} + \beta_3 * D^i_{<j,t-1} + \beta_4 * D^i_{>j,t-1} + \beta_5 * D^i_{<j,t-1} \\ * T + \beta_6 * D^i_{>j,t-1} * T + \beta_7 * T + \beta_8 * Unfair^i_{t-1} + \beta_9 * P^i_{t-1} + \sum_k \gamma_k C^i_k + \varepsilon_{ti}\end{aligned} \tag{2}$$

In (2), $\beta_1$ and $\beta_2$ capture the impact of matching-group-level information, which we denote by 'group contagion' and 'group conformism', respectively. $\beta_3$ measures the effect of previously having had a lower bribe than the competitor in *LI*, $\beta_3 + \beta_5$ measures the same for *HI*. Similarly, $\beta_4$ measures the effect of previously having had a higher bribe than the competitor in *LI*, and $\beta_4 + \beta_6$ does so for *HI*. We refer to these responses to the previous difference with competitor's btibe as 'competitor contagion' and 'competitor conformism'. The coefficients $\beta_1, ..., \beta_6$ allow us to test for contagion and conformism. With information about the average matching-group bribes in *HI*, a positive $\beta_1$ indicates group contagion and a negative $\beta_2$ indicates group conformism. As for information about the competitor's bribe, a positive $\beta_3$ indicates competitor contagion in *LI* and a positive $(\beta_3 + \beta_5)$ indicates competitor contagion in *HI*. A negative $\beta_4$ indicates competitor conformism in *LI* while a negative $(\beta_4 + \beta_6)$ indicates competitor conformism in *HI*. Finally, we cluster standard errors $\varepsilon_{ti}$ at the session and matching group levels.

Hypotheses 2 predicts contagion, that is, for *HI* $\beta_1 > 0$ and for *LI* $\beta_3 > 0$. It also predicts that contagion is larger in *HI* than in *LI*: $\beta_1 > \beta_3$. Note that we have no hypotheses on the effect of information about the competitor's bribe in *HI* $(\beta_3 + \beta_5)$. This is because having information about the matching group may make the competitor's bribe less informative. Similarly, Hypotheses 3 predicts conformism, that is, for *HI* $\beta_2 < 0$ and for *LI* $\beta_4 < 0$. It also predicts that conformism is stronger in *HI* than in *LI*: $\beta_2 < \beta_4$. Again, we have no hypotheses on the effect of information about the competitor's bribe in *HI* $(\beta_4 + \beta_6)$.

Note that in eq. 2 the lagged bribe appears on both sides of the equality (more precisely, in $\Delta B^i_t$, $D^i_{<A,t-1}$, $D^i_{>A,t-1}$, $D^i_{<j,t-1}$, and$D^i_{>j,t-1}$). For this reason, one would obtain positive coefficients for $\beta_1$ and $\beta_3$ and negative coefficients for $\beta_2$ and $\beta_4$ even if bribes were determined randomly (and these coefficients would likely be significantly different than zero).[22] To circumvent this problem, we permute the observed bribes 10,000 times and calculate the fraction of

[21]See Appendix appendix C for more details.

[22]A Stata code is available upon request to assert this claim.

observed $\beta$ values that lie above the estimated coefficient for $\beta_1$ and $\beta_3$ and below it for $\beta_2$ and $\beta_4$. The resulting fraction is denoted as the $p-$value in Table 3, below.

**Regression results**

The regression is performed for each country separately and for the pooled data. In each matching group, there are 8 performers. With ten periods there are 80 bribe observations per matching group and $80 * 12 = 960$ observations.[23] Dropping the first period data for the regression and one participant in $CH$ who did not provide personal data leaves us with 864 observations in $NL$ and $IT$, 855 in $CH$, and 882 in Russia.

Table 3 presents the results of estimating the coefficients of eq. (2). Recall that $\beta_1, ..., \beta_6$ are the coefficients related to contagion and conformism. We use the results to test Hypotheses 2 and 3. Recall that the former (the contagion effect) predicts $\beta_1 > 0$ and $\beta_3 > 0$. We strongly reject the null hypothesis of no effect in favor of these contagion effects in $RS$ and $IT$, as well as for the pooled data. Contagion thus appears to be a strong force in the development of descriptive norms in these countries. Hypothesis 3 (conformism) predicts $\beta_2 < 0$ and $\beta_4 < 0$. We find no evidence of a conformism effect in response to average bribes in the matching group ($\beta_2$ is not significantly different than what random bribes would yield in any of the regressions). In response to the competitor's bribe ($\beta_4$) we observe marginally significant conformism in $NL$ and strongly significant conformism in $CH$. Thus, while contagion appears to be an important effect in Russia and Italy, (some) conformism is only observed in the Netherlands and China.

Hypothesis 2 also predicts that group contagion is stronger than competitor contagion ($\beta_1 > \beta_3 > 0$), while Hypothesis 3 predicts stronger group conformism than competitor conformism ($\beta_2 < \beta_4 < 0$). For the reasons mentioned above when discussing how to test the significance of the coefficients, we cannot use F-tests to investigate these predictions. The eight comparisons between coefficients that this yields, however, all have the predicted sign. A binomial test rejects a hypothesis of equal likelihoods of contagion being stronger or weaker than conformism ($prob[\beta_1 > \beta_3] = prob[\beta_3 > \beta_1]$ and $prob[\beta_2 > \beta_4] = prob[\beta_4 > \beta_2]$) in favor of the hypothesis that that information at the group level has a stronger affect than information about one's competitor ($p = 0.004$).[24]

It is interesting to compare the contagion and conformism effects. To do so, we compare the absolute values of the coefficients $\beta_2$ to $\beta_1$ and the absolute values of $\beta_4$ to $\beta_3$. This gives eight comparisons, in six of which the conformism effect is larger than the contagion effect. A binomial test of these eight comparisons cannot reject the hypothesis that contagion is equally likely to be stronger or weaker than conformism in favor of an alternative that either is more

[23]Recall that in one matching group in $RS$ there were 10 performers; see fn 8. This gives 20 additional observations in $RS$.

[24]For conformism, we obtain this result in spite of the fact that only information at the individual level is significantly different than zero (in $NL$ and $CH$).

Table 3: Bribes: Contagion and Conformism

| | Netherlands | Russia | Italy | China | Pooled |
|---|---|---|---|---|---|
| $\beta_1$ (group contagion) | 0.995 | 1.130*** | 1.297*** | 1.103 | 1.153*** |
| Group average bribe - Own bribe (previous period) | (0.127) | (0.182) | (0.130) | (0.173) | (0.084) |
| p-value permutation test | 0.169 | 0.006 | 0.001 | 0.202 | 0.000 |
| $\beta_2$ (group conformism) | -1.060 | -1.165 | -1.081 | -1.067 | -1.098 |
| Own bribe - Group average bribe (previous period) | (0.116) | (0.102) | (0.113) | (0.076) | (0.041) |
| p-value permutation test | 0.703 | 0.447 | 0.477 | 0.272 | 0.457 |
| $\beta_3$ (competitor contagion) | 0.423 | 0.544*** | 0.441** | 0.163 | 0.387*** |
| Competitor bribe - Own bribe (previous period) | (0.063) | (0.113) | (0.051) | (0.109) | (0.060) |
| p-value permutation test | 0.436 | 0.000 | 0.017 | 0.984 | 0.006 |
| $\beta_4$ (competitor conformism) | -0.709* | -0.688 | -0.710 | -0.855*** | -0.731 |
| Own bribe - Competitor bribe (previous period) | (0.075) | (0.110) | (0.077) | (0.094) | (0.049) |
| p-value permutation test | 0.052 | 0.949 | 0.598 | 0.006 | 0.265 |
| $\beta_5$ (competitor contagion) | -0.366 | -0.659*** | -0.539** | -0.284 | -0.472** |
| [Comp. bribe - Own bribe (prev. per.)]*treatment | (0.078) | (0.131) | (0.063) | (0.116) | (0.069) |
| p-value permutation test | 0.786 | 0.000 | 0.021 | 0.811 | 0.023 |
| $\beta_6$ (competitor conformism) | 0.571 | 0.716 | 0.714 | 0.775* | 0.672 |
| [Own bribe - Comp. bribe (prev. per.)]*treatment | (0.084) | (0.182) | (0.116) | (0.109) | (0.071) |
| p-value permutation test | 0.392 | 0.423 | 0.452 | 0.076 | 0.249 |
| $\beta_7$ | -0.212 | 0.029 | -0.217 | -0.562 | -0.218 |
| Treatment dummy | (0.427) | (0.370) | (0.223) | (0.356) | (0.167) |
| $\beta_8$ | -0.204 | -0.280 | 0.029 | -0.356 | -0.226* |
| Unfair judge previous period | (0.279) | (0.175) | (0.194) | (0.272) | (0.115) |
| $\beta_9$ | 0.221** | 0.053 | -0.013 | 0.133** | 0.131*** |
| Own performance in previous period | (0.072) | (0.052) | (0.073) | (0.052) | (0.039) |
| Observations | 864 | 882 | 864 | 855 | 3,465 |

*Notes:* The dependent variable is the change in bribe (eq. 2). Standard errors (clustered by matching group) are in parentheses. For reasons discussed in the main text, we use permutation tests to establish significance of the contagion and conformism variables. Controls include 23 personal characteristics; these are derived from survey questions listed in Appendix C. The pooled regression also includes three dummy variables for *Russia*, *Italy*, and *China*. All * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

likely to be stronger ($p = 0.289$).

Recall that we have no prediction about the effect of information about the competitor's previous bribe in *HI*, that is, we do not formally predict the signs of $\beta_5$ and $\beta_6$. Intuitively, one may expect the impact of this information in $HI$ to be lower than in *LI* because performers also have aggregate information in the former case. This would mean that $\beta_5 < 0$ and $\beta_6 > 0$. The results support this intuition, that is, that $\beta_5 < 0$ and $\beta_6 > 0$ in all countries. The remaining question, then, is whether in *HI* information about the competitor affects bribes, that is, whether we can reject $\beta_3 + \beta_5 = 0$ and $\beta_4 + \beta_6 = 0$. We again apply permutations to assess these hypotheses. The results are statistically insignificant in each country for both contagion and conformism (all $p > 0.16$). We conclude that when there is information about the group average, then information about the bribe of the other performer one was previously grouped with plays at most a minor role.

Finally, we consider the effects of two of our controls, having previously encountered an unfair judge ($\beta_8$) and previous performance ($\beta_9$). An unfair judge has little effect on subsequent bribes. As for previous performance, the effects are positive and statistically significant in $NL$ and $CH$. A higher previous performance then leads to an increase in current bribes. This may be related to a sense of entitlement.

**Interaction with prescriptive norms**

We saw above that the strongest prescriptive norms against bribing are observed in $CH$, followed by $NL$, $RS$, and $IT$ (cf. Table 1). Because these norms in $IT$ and $RS$ appear to be similar, as do those in $CH$ and $NL$, we simplify by pairing the countries in this way.

Hypothesis 4 then predicts that in early periods contagion and conformism are stronger in $IT + RS$ than in $CH + NL$. This does not appear to be the case for group conformism.Though the coefficients $\beta_1$ in Table 3 show that group contagion is indeed higher in $RS$ and $IT$ than in $NL$ and $CH$, the difference is statistically insignificant ($p = 0.307$).[25] For competitor contagion, however, $\beta_1$ is significantly higher in $IT + RS$ than in $CH + NL$ ($p = 0.010$). This suggests that the stronger prescriptive norms in the latter two countries reduce the role of descriptive norms in the first half of the experiment. As for conformism, $|\beta_2|$ is larger in $RS$ and $IT$ than in $NL$ and $CH$; the difference is small, however, and statistically insignificant ($p = 0.419$). $|\beta_4|$ has a mixed pattern and provides no evidence for the hypothesis. We conclude that prescriptive norms do not weaken the effect of descriptive norms in our data with the possible exception of competitor contagion. This lack of support for Hypothesis 4 suggests that the two kinds of norms are generally complements, not substitutes. We will return to this issue in the concluding discussion.

Next consider the first part of Hypothesis 5 (that prescriptive norms concerning bribes weaken as descriptive norms develop). We first compare the mean bribe in the two countries with strong prescriptive bribe norms ($NL$ and $CH$) to that in the countries with low prescriptive norms ($RS$ and $IT$). We do so for the first and second half of the experiment to see whether the difference

[25] To test this, we created a dummy variable for participants in $IT$ and $RS$ and interacted this with the contagion and conformism variables. We then reran the regressions in eq. 2 and the corresponding permutations for the first five periods. Conclusions about significance are based on these permutations.

between the two pairs of countries diminishes as predicted. In the first five periods, mean bribes are 3.05 and 2.71, respectively, in the last five periods they are 3.06 and 2.82; the difference thus reduces from 0.34 to 0.24. To test whether this difference is significant, we regress bribes on dummies representing (i) the second half of the experiment, and (ii) $RS$ or $IT$, and their interaction (clustering at the level of matching groups). The results show that the coefficient of the interaction term is statistically insignificant ($p = 0.440$). We therefore find no support for the hypothesis that the effect of prescriptive norms on bribes weakens across periods.

To investigate whether the role of descriptive norms increases across periods, we also ran the regression of eq 2 separately for the first and second half of the experiment. If the hypothesis is correct, then we would expect stronger contagion and conformism effects in the second half of the experiment than in the first half. The results are given in Appendix F. The six coefficients related to conformism and contagion in each of the four countries yield 24 coefficients. 15 of these are larger (in absolute value) in the first half of the experiment and 9 are larger in the second half. Again, we observe no evidence of a reduced importance of prescriptive norms in the second half of the experiment.

All in all, we find no support for the first part of Hypothesis 5. Recall that this hypotheses was based on the assumption that the two types of norms are substitutes. Given that we concluded from out analysis of Hypothesis 4 that they are more likely to be complements, the result for Hypothesis 5 should not come as a surprise.

### 4.3 Judges' decisions

As a final analysis, we consider judges' corruption. First note that our information treatments also affect the judges. In *LI*, a judge only observes the bribes by the two performers in her group. Judges in *HI* also observe the average bribe in their matching groups.

We first define corruption. As introduced above, we say that a judge makes a corrupt decision if she nominates a less successful performer who offers a larger bribe, i.e., the judge allocates the prize to player $i$ while $(P_i < P_j \wedge B_i > B_j)$. This means that there are various situations where a corrupt choice is not possible. In particular, no corruption can occur if there are ties in bribes or performance or if the better performer bribes more.[26] Within each country in each matching group there are four judges, each making ten decisions. We have 12 matching groups per country, which results in 480 observations per country (490 in $RS$ because of the one case with a larger matching group). We summarize all possible cases with respect to corruption in Appendix G. Corruption was possible in 121 cases in $NL$, 142 times in $RS$, 171 times in $IT$, and 148 times in $CH$. Of these opportunities, corruption was observed in 68% of the cases in $NL$, 63% in $RS$, 60% in $IT$, and 56% in $CH$.

[26] Of course, in the world outside the laboratory, taking a bribe is considered to be a corrupt act irrespective of the subsequent decision. In this respect, our definition may be seen as providing a lower bound on corrupt choices.

We use a Probit regression to further investigate how corruption varies across information treatments and countries. We consider only the cases where corruption was possible. The dependent variable is a dummy variable indicating whether or not the judge made the corrupt choice. It is regressed on the treatment dummy of being in $HI$, the sum of and difference between performers' bribes, and the difference between performers' scores. The marginal effects are reported in Table 4.

Table 4: Determinants of corrupt judges

| | $NL$ | $RS$ | $IT$ | $CH$ |
|---|---|---|---|---|
| Treatment | 0.339** | -0.087 | 0.148 | 0.262** |
| | (0.150) | (0.183) | (0.131) | (0.109) |
| Total bribes | 0.002 | 0.005 | -0.019 * | 0.006 |
| | (0.008) | (0.022) | (0.011) | (0.018) |
| Bribe differences | 0.080** | 0.026 | 0.053** | 0.052** |
| | (0.033) | (0.021) | (0.022) | (0.022) |
| Performance difference | -0.016 | -0.017 | -0.088*** | -0.109*** |
| | (0.020) | (0.032) | (0.026) | (0.039) |
| Observations | 121 | 135 | 168 | 147 |

*Notes:* The table reports marginal effects for the probit regression described in the main text. Standard errors (clustered at the level of matching groups) are in parentheses. Period (separately per treatment), individual fixed effects, and 22 personal characteristics are included as regressors but not reported in the table; more details are available upon request. Numbers of observations may deviate slightly from those reported in the main text due to missing observations on personal characteristics.$^{*}$ $p < 0.10$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$.

Table 4 shows that having the chances of a judge acting corruptly increases with the difference in bribes, though this is not statistically significant in $RS$.[27] A larger performance difference reduces the chances that the poorer performer will win the prize, though this effect is statistically insignificant in $NL$ and $RS$. The information treatment has a strong and significant positive effect in $NL$ and $CH$. Knowing about the average bribes in the matching group increases the likelihood of a corrupt decision by 34%-points in $NL$ and 26%-points in $CH$.

The second part of Hypothesis 5 predicts that country differences in the effects of prescriptive norms will diminish over time. For our Probit regression this would mean that the likelihood of corruption becomes more similar across countries as the periods progress. Because of the numbers of observations, we cannot split the data used in Table 4 in the first and second halves of periods like we did for bribes. Instead, we pool across countries and run the same regression as in Table 4 while adding dummy variables for $NL$, $RS$, and $IT$ (thus comparing differences with

[27]Recall that in all these cases, the performer with the higher bribe has the lower performance.

$CH$) and interactions between country dummies and the period. Recall that corruption is lowest in $CH$ (56%) and highest in $NL$ (68%). Our regressions show that the baseline difference (in 'period 0') is statistically significant between $NL$ and $CH$ (the dummy for $NL$ has a coefficient with $p < 0.01$) and between $IT$ and $CH$ ($p = 0.04$). All other pairwise differences are statistically insignificant (all $p > 0.13$). Over periods, corruption increases in $RS$ and $CH$, while it decreases in $NL$ and $IT$. None of these trends are statistically significant (all $p > 0.24$). These trends do, however, narrow the gaps between countries. For example, the (estimated) baseline gap between $NL$ and $CH$ is 0.23. Over ten rounds, the probability that a judge in $CH$ makes a corrupt decision increases by 0.11 while that for a judge in $NL$ decreases by 0.03. Together, this means that the original gap is reduced over time by more than 56%. This remains the largest gap between any two countries. These results suggest that the role of prescriptive norms indeed diminishes over time in spite of the trends per country being statistically insignificant.

# 5 Discussion and Conclusions

To develop anti-corruption policies, it is important to understand the determinants of corrupt behavior. In this paper, we have focused on the role of prescriptive and descriptive norms. We observe that prescriptive norms differ per country. For example, we find evidence of norms against bribery and corruption in China and the Netherlands while both acts are deemed more appropriate in Italy. Chinese and Russian participants are more averse to corruption than the Dutch. This is interesting, because China and Russia are conventionally considered to feature much higher levels of corruption. This suggests that corrupt practices and anti-corruption norms could coexist (as argued in different contexts by Hoffmann and Patel 2017 and Jackson and Köbis 2018). We believe that the decision to bribe or act corruptly is affected by a cost-benefit analysis of the decision involved. The costs include the disutility of acting against a social norm. Even if these costs are the same in two distinct cultures, the benefits may differ. In some countries, for example, it might simply be far more difficult than in others to realize economic gains from trade if one does not participate in bribery and corruption.[28]

For our corruption game, we find differences across countries that do not always run parallel to perceived corruption in the field. The controlled laboratory environment thus allows us to conclude that institutional differences between countries (which are held constant in the experiment) are important determinants of corruption in the field. A similar conclusion with respect to tax evasion in Albania and the Netherlands was reached in Gërxhani and Schram (2006). For our laboratory results, we have analyzed how the interaction between prescriptive and de-

[28]China is an interesting case, because President Xi Jinping's has implemented a number of anti-corruption reforms since taking office in 2013. This anti-corruption campaign may affect norm measurement while not (yet) affecting behavior in the experiment (which subjects may not relate to the reforms) or in the field. We consider further corruption experiments in China -both in the laboratory and in the field- to be an interesting avenue for future research.

scriptive norms affect corruptive choices. In the field, this interaction might itself be affected by country-specific institutions (for example, if norm enforcement differs across countries). This makes an analysis of this interaction with observational field data very difficult. More research on how institutions affect the interaction between prescriptive and descriptive social norms is needed.

We find some evidence that the disclosure of information about a common level of corruption induces players to adjust their behavior and to converge towards this common level. Similar results have been received in other contexts (Bicchieri et al. 2019; Köbis et al. 2019). Our results show that the convergence process is asymmetric and differs across cultures. It is asymmetric, because we observe contagion (increasing bribes when one observes that others are bribing more) but not conformism (reducing bribes when others are bribing less). The contagion we observe is particularly strong in Russia and Italy. The relative strength of contagion compared to conformism that we observe suggests that a policy that reveals average bribe levels will reduce bribes by those who are above this average less than it will increase the bribes of those below average. Together, such a policy would then increase corruption.

Italy is also the odd one out when it comes to creating a situation where corruption is possible.[29] In contrast to the other countries, Italians do not adjust their bribes to their performance in an attempt to avoid putting the judge in a position where corruption is possible. As a consequence there are more situations with a potential for corruption in Italy. Yet, we do not observe more corruption in Italy. Furthermore, in contrast to judges in the Netherlands and China (but similar to those in Russia), Italian judges do not increase corrupt choices when information about average bribes is disclosed. It appears that corruption is simply accepted from the start as a 'reasonable' possibility. This is supported by the prescriptive norms that we elicited in Italy; Italians tend to find bribes and corruption (mildly) appropriate.

We believe that the laboratory provides a useful and necessary environment to isolate the effects of prescriptive and descriptive norms and to study their interaction in different cultures. The relevance of our conclusions are, of course, dependent on the external validity of our experiments. In particular, one might ask whether the subject pools of university students are representative of the general populations in the countries. We would argue that cultural differences between students are, if anything, smaller than between general populations. In this respect, any differences we find across countries might provide a lower bound for more general cross-country differences. The fact that we do find differences speaks to the external validity of our results. This is not very surprising; social norms evolve slowly and students may be expected to be strongly influenced by the norms of their parents and educators.[30]

[29]It should be noted that our Italian sessions were run in Bologna and our conclusions about 'Italy' therefore reflect behavior in Northern Italy. Stark cultural differences exist between the North and the South of Italy (e.g., Bigoni et al. 2016).

[30]More generally, there is high correlation between behavior of student participants in the laboratory, Amazon Turk participants in experiments and choices by representative samples (Snowberg and Yariv, 2021).

Nevertheless, an interesting avenue for future research would be to use other subject pools and conduct similar experiments in the field. Another interesting direction might be to incorporate punishment into this game. Punishment adds to the costs in the cost-benefit analysis referred to above. Since punishment continues to be one of the most common methods used to combat corruption, it would be highly policy-relevant to allow performers to punish judges if the latter are corrupt. One could then analyze how this affects, first, the propensity of judges to be corrupt and, second, the behavior of bribers.

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# Appendices

## A Instructions for corruption game

Please find below the instructions used in Amsterdam. The same instructions were used in China and Italy translated in Chinese and Italian respectively.

**Treatment with no information.**

Welcome to our experiment!

This is an experiment on decision-making where you may earn money. The amount of money you earn will depend upon the decisions you make and on the decisions other people make. You will be paid privately at the end of the experiment, there is no obligation to tell others how much you earn. In the experiment you will remain anonymous. The experiment will take approximately one-and-a-half hour.

You have already received 7 Euros for showing up. Your total earnings will be the sum of this 7 euros and your payoffs in the experiment. In this experiment we use experimental tokens. At the end of the experiment these will be exchanged to euros at a rate of 1 token = 1 euro and you will be paid in cash.

Please read the instructions carefully and do not communicate with each other during the experiment. If you have a question, please raise your hand and an experimenter will come to help you. There are 24 participants in this experiment. All the participants are randomly divided into two types. Sixteen of you are players, eight are judges. There will be 10 independent periods in this experiment.

At the beginning of every period each participant of each type receives 10 tokens. Groups of three are formed, each consisting of two players and one judge. The two players will perform a task during 5 minutes. The task is explained below. The task gives each of these players a score. The better a player does at the task, the higher will be her or his score. After they have finished, the judge will decide on the winner. The winner will receive 10 points. The judge will not perform the task. He or she can give the prize to either of the two players in his or her group. Please note that the judge must allocate this prize to one of the two players. The amount of the prize will be added to the final payoff of the players. This prize will NOT be deduced from the earnings of the judge. Before the judge decides, each of the two players decides whether to transfer tokens to the judge in their group. They may transfer any amount between 0 and 10. As soon as both players have made their choices, the judge will see on her or his computer screen the information about the score of both players and their transfers. Then a new period starts and all will be randomly rematched into new groups of three (two players and one judge). You will not change your type, players remain players and judges remain judges. The rules for all 10 periods are identical. All periods are independent.

At the end of the experiment every participant of each type will receive his or her earnings from one randomly picked period plus the show-up fee of 7 euros.

*The Task*

You will see two matrices on the computer screen. Each matrix has 10 rows and 10 columns and is filled with randomly generated numbers. Your task is to find the largest number in each of the matrices and add them up. You are not allowed to use calculators but you can use the paper and pencil that you have found on your desk. After entering the number, the computer will tell you whether it is correct or incorrect (the time will continue to run while you see the result). Then, irrespective of whether your answer is correct or incorrect a new pair of matrices will appear. New matrices will appear as long as you are within the 5 minutes limit with the max of 10 matrices. When the 5 minutes limit ends, participants A and B will see the total number of correct solutions that they have achieved.

**Treatment with information.**

Welcome to our experiment!

This is an experiment on decision-making where you may earn money. The amount of money you earn will depend upon the decisions you make and on the decisions other people make. You will be paid privately at the end of the experiment, there is no obligation to tell others how much you earn. In the experiment you will remain anonymous. The experiment will take approximately one-and-a-half hour.

You have already received 7 Euros for showing up. Your total earnings will be the sum of this 7 euros and your payoffs in the experiment. In this experiment we use experimental tokens. At the end of the experiment these will be exchanged to euros at a rate of 1 token = 1 euro and you will be paid in cash.

Please read the instructions carefully and do not communicate with each other during the experiment. If you have a question, please raise your hand and an experimenter will come to help you. There are 24 participants in this experiment. All the participants are randomly divided into two types. Sixteen of you are players, eight are judges. There will be 10 independent periods in this experiment.

At the beginning of every period each participant of each type receives 10 tokens. Groups of three are formed, each consisting of two players (A and B) and one judge. The two players will perform a task during 5 minutes. The task is explained below. The task gives each of these players a score. The better a player does at the task, the higher will be her or his score. After they have finished, the judge will decide on the winner. The winner will receive 10 points. The judge will not perform the task. He or she can give the prize to either of the two players in his or her group. Please note that the judge must allocate this prize to one of the two players. The amount of the prize will be added to the final payoff of the players. This prize will NOT be deduced from the earnings of the judge.

Before the judge decides, each of the two players decides whether to transfer tokens to the judge in their group. They may transfer any amount between 0 and 10. As soon as both players have made their choices, the judge will see on her or his computer screen the information about the score of both players and their transfers. Then a new period starts and all will be randomly rematched into new groups of three (two players and one judge). You will not change your type, players remain players and judges remain judges. The rules for all 10 periods are identical. All periods are independent. At the end of the experiment every participant of each type will receive his or her earnings from one randomly picked period plus the show-up fee of 7 euros.

At the end of each period we will show you on your monitor information about what occurred in four randomly chosen groups (eight players and four judges). This information will involve the average transfers by players to the judges.

*The Task*

You will see two matrices on the computer screen. Each matrix has 10 rows and 10 columns and is filled with randomly generated numbers. Your task is to find the largest number in each of the matrices and add them up. You are not allowed to use calculators but you can use the paper and pencil that you have found on your desk. After entering the number, the computer will tell you whether it is correct or incorrect (the time will continue to run while you see the result). Then, irrespective of whether your answer is correct or incorrect a new pair of matrices will appear. New matrices will appear as long as you are within the 5 minutes limit with the max of 10 matrices. When the 5 minutes limit ends, players A and B will see the total number of correct solutions that they have achieved.

## B Instructions for social norm measurement

Welcome to our experiment!

This is an experiment on decision-making where you may earn money. The amount of money you earn will depend upon the decisions you make and on the decisions other people make. You will be paid privately at the end of the experiment, there is no obligation to tell others how much you earn. In the experiment you will remain anonymous. The experiment will take approximately half an hour. You have already received 5 Euros for showing up. Your total earnings will be the sum of this 5 euros and your payoffs in the experiment.

Please read the instructions carefully and do not communicate with each other during the experiment. If you have a question, please raise your hand and an experimenter will come to help you.

There are 39 participants in this experiment.

Assume that there is the following situation.

*There is a group of three that consists of two players, A and B, and one judge. Initially each player has 10 points. The two players perform a task during 5 minutes. The task gives each of these players a score. The better a player does at the task, the higher will be her or his score. On average, players score 12 on this task. After the two players have finished, the judge will decide on the winner. The winner will receive 10 points. The judge will not perform the task. He or she can give the prize to either of the two players. Please note that the judge must allocate this prize to one of the two players. The amount of the prize will be added to the final payoff of the players. This prize will NOT be deduced from the earnings of the judge.*

*Before the judge decides, each of the two players decides whether to transfer tokens to the judge. They may transfer any amount between 0 and 10. As soon as both players have made their choices, the judge will see on her or his computer screen the information about the score of both players and their transfers.*

You will not participate in this situation. Instead, your task today is to analyze the potential outcomes. We are interested in what you think about what most people feel is the appropriate choice in certain situations. So, we are not asking what you personally think that one should do, but what you think that most people feel is appropriate.

On the following pages, you will read descriptions of a series of situations. These descriptions correspond to situations in which one person, either the judge or one of the players, must make a decision. For each situation, you will be given a description of the decision faced by the individual. This description may include several possible choices available to the individual. After you read the description of the decision, you will be asked to evaluate the different possible choices and to decide, for each of the possible actions, whether taking that action would be "socially appropriate" and "consistent with moral or proper social behavior" or "socially inappropriate" and "inconsistent with moral or proper social behavior." By socially appropriate, we mean behavior that most people agree is the "correct" or "ethical" thing to do. Another way to think about what we mean is that if the individual A were to select a socially inappropriate choice, then someone else might be angry at her or him for doing so.

In each of your responses, we would like you to answer as truthfully as possible, based on your opinions of what constitutes socially appropriate or socially inappropriate behavior.

Your payoffs for this experiment will be formed in the following way. You will be asked to respond to 17 different situations (split across four answer sheets). At the end we will randomly select one of these 17 situations for payment. For this situation we will check which answer was given most often (this is called the "modal" answer). You will receive 10 euros if you guess the modal answer among all the 39 participants. If you do not guess the modal answer, you will receive only the participation fee. In other words, if you give the same response as that most frequently given by other people, then you will receive an additional 10 euro.

To summarize, your task for each situation is to predict the answer that is most often chosen by everyone in this room today. If you guess correctly, you will earn 10 euros.

**Answer Sheet 1**

Recall that the average player scores 12 on this task. Consider the situation where

- player A scores 20
- player B scores 12

In the table below we show different transfers by player B and different decisions by the judge. Indicate for each of the situations whether the judge's decision is "very socially inappropriate ", "somewhat socially inappropriate ", "somewhat socially appropriate ", or "very socially appropriate ". For each situation, you may indicate your response by marking the corresponding cell with an "X". Remember, if one of these situations is the one chosen for payment, then you will receive 10 euros if your choice is the response most often given by other people in today's session.

| Player A transfers: | Player B transfers: | The judge gives the prize to: | The judge decision is: very socially inappropriate | somewhat socially inappropriate | somewhat socially appropriate | very socially appropriate |
|---|---|---|---|---|---|---|
| 7 | 3 | A | | | | |
| 7 | 3 | B | | | | |
| 3 | 7 | A | | | | |
| 3 | 7 | B | | | | |

*Notes:* Recall that player A has a score of 20 and player B has a score of 12. Note that answering for these situations requires that you place four X (one in each row).

.

**Answer Sheet 2**

Recall that the average player scores 12 on this task. Consider the situation where

- player A scores 20
- player B scores 12

In the table below we show different transfers by player B and different decisions by the judge. Indicate for each of the situations whether the judge's decision is ”very socially inappropriate ”, ”somewhat socially inappropriate ”, ”somewhat socially appropriate ”, or ”very socially appropriate ”. For each situation, you may indicate your response by marking the corresponding cell with an ”X”. Remember, if one of these situations is the one chosen for payment, then you will receive 10 euros if your choice is the response most often given by other people in today's session.

| Player A transfers: | Player B transfers: | The judge gives the prize to: | The judge decision is: very socially inappropriate | somewhat socially inappropriate | somewhat socially appropriate | very socially appropriate |
|---|---|---|---|---|---|---|
| 3 | 0 | A | | | | |
| 3 | 0 | B | | | | |
| 0 | 3 | A | | | | |
| 0 | 3 | B | | | | |

*Notes:* Recall that player A has a score of 20 and player B has a score of 12. Note that answering for these situations requires that you place four X (one in each row).

.

**Answer Sheet 3**

Recall that the average player scores 12 on this task. In the table below we show different scores for one of the players (which we call player C) and different transfers by the same player. Indicate for each of the situations whether this transfer is "very socially inappropriate ", "somewhat socially inappropriate ", "somewhat socially appropriate ", or "very socially appropriate ". For each situation, you may indicate your response by marking the corresponding cell with an "X". Remember, if one of these situations is the one chosen for payment, then you will receive 10 euros if your choice is the response most often given by other people in today's session.

| | | Player C's transfer decision is: | | | |
|---|---|---|---|---|---|
| Player C's score: | Player C transfers: | very socially inappropriate | somewhat socially inappropriate | somewhat socially appropriate | very socially appropriate |
| 12 | 0 | | | | |
| 20 | 3 | | | | |
| 4 | 7 | | | | |
| 4 | 0 | | | | |

*Notes:* Note that answering for these situations requires that you place four X (one in each row).

.

**Answer Sheet 4**

Recall that the average player scores 12 on this task. In the table below we show different scores for one of the players (which we call player C) and different transfers by the same player. Indicate for each of the situations whether this transfer is "very socially inappropriate ", "somewhat socially inappropriate ", "somewhat socially appropriate ", or "very socially appropriate ". For each situation, you may indicate your response by marking the corresponding cell with an "X". Remember, if one of these situations is the one chosen for payment, then you will receive 10 euros if your choice is the response most often given by other people in today's session.

| | | Player C's transfer decision is: | | | |
|---|---|---|---|---|---|
| Player C's score: | Player C transfers: | very socially inappropriate | somewhat socially inappropriate | somewhat socially appropriate | very socially appropriate |
| 12 | 7 | | | | |
| 12 | 3 | | | | |
| 20 | 0 | | | | |
| 20 | 7 | | | | |
| 4 | 3 | | | | |

*Notes:* Note that answering for these situations requires that you place four X (one in each row).

## C The survey

1. Your age.
2. Your nationality[31]
    - the Netherlands
    - Western Europe excluding the Netherlands
    - Russia
    - Eastern Europe excluding Russia
    - Italy
    - Southern Europe excluding Italy
    - China
    - Other
3. Your gender:
    - male;
    - female
4. Your height (in centimeters)
5. Your field of studies:
    - economics, finance, management;
    - social science, psycology, political science ;
    - law ;
    - international relation ;
    - mathematics, computer science ;
    - humanities ;
    - media, journalism, design ;
    - other
6. Do you like risk or avoid risk?
    - I like risk;
    - rather like risk;
    - neutral to risk;

[31] This question was included only in the survey in Amsterdam

- rather avoid risk;
- avoid risk

7. Which statement most accurately describes the financial situation of your family?

   - money is not enough to survive;
   - enough money only for urgent needs;
   - There is enough money for daily expenses, but already buying clothes requires savings;
   - There is enough money, even some savings, but large purchases need to be planned in advance;
   - We can afford large expenses at the first necessity.

8. Given all the circumstances, how satisfied are you with your life in general? (from 1 "completely dissatisfied" to 10 "completely satisfied")

9. In your opinion, in general, most people can be trusted, or when communicating with other people caution never hurts? Please mark the position on the scale, where 1 means "You have to be very careful with other people" and 10 means "Most people can be completely trusted"

10. Some people feel that they have complete freedom of choice and control their lives, while other people feel that what they are doing does not have a real impact on what is happening to them. To what extent are these characteristics applicable to you and your life? Please mark the position on the scale, where 1 means "I do not have freedom of choice" and 10 means "I have total freedom of choice"

# D Descriptive statistics

| | NL (T) | | NL (C) | | IT (T) | | IT (C) | | CN (T) | | CN (C) | | RS (T) | | RS (C) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mean | sd | mean | sd | mean | sd | mean | sd | mean | sd | mean | sd | mean | sd | mean | sd |
| Age | 21.01 | 2.45 | 22.38 | 5.14 | 22.89 | 2.68 | 22.07 | 2.56 | 21.73 | 2.27 | 21.61 | 2.11 | 21.77 | 5.60 | 20.69 | 3.49 |
| Female | 0.50 | 0.50 | 0.40 | 0.49 | 0.56 | 0.50 | 0.54 | 0.50 | 0.69 | 0.46 | 0.61 | 0.49 | 0.51 | 0.50 | 0.47 | 0.50 |
| Risk attitude | 3.07 | 1.03 | 2.97 | 1.11 | 2.85 | 1.14 | 2.79 | 1.11 | 2.92 | 1.03 | 2.57 | 0.91 | 3.12 | 1.02 | 2.81 | 0.91 |
| Income | 3.92 | 0.86 | 4.06 | 0.64 | 3.71 | 0.70 | 3.50 | 0.87 | 3.52 | 0.73 | 3.56 | 0.58 | 3.83 | 0.70 | 3.65 | 0.65 |
| Life satisfaction | 7.29 | 2.00 | 7.53 | 1.49 | 7.51 | 1.44 | 7.42 | 1.79 | 6.49 | 1.74 | 6.93 | 1.54 | 7.27 | 1.88 | 6.71 | 2.07 |
| Trust | 5.57 | 1.92 | 5.89 | 2.15 | 4.78 | 2.08 | 4.99 | 2.34 | 5.89 | 1.89 | 6.31 | 1.80 | 5.36 | 1.98 | 5.22 | 2.03 |
| Freedom | 7.40 | 1.82 | 7.31 | 1.78 | 7.24 | 1.81 | 7.32 | 1.94 | 6.41 | 1.69 | 6.96 | 1.75 | 7.30 | 1.79 | 7.32 | 1.75 |
| Major in economics | 0.67 | 0.47 | 0.47 | 0.50 | 0.28 | 0.45 | 0.31 | 0.46 | 0.58 | 0.49 | 0.62 | 0.48 | 0.63 | 0.48 | 0.62 | 0.48 |
| Observations | 720 | | 720 | | 720 | | 720 | | 720 | | 720 | | 810 | | 720 | |

# E Social norm indices

In this appendix, we provide more details about the prescriptive norms measured in the social norm sessions. As explained in the main text, we convert appropriateness responses to a numerical index (Krupka and Weber 2013); a rating of "very socially inappropriate" is given a score of -1, "somewhat socially inappropriate" a score of $-\frac{1}{3}$, "somewhat socially appropriate" a score of $\frac{1}{3}$, and "very socially appropriate"a score of 1. We thus arrive at an index that varies from -1 (very socially inappropriate) to 1 (very socially appropriate). For example, a normalized index of $-0.5$ for a bribe of 3 means that participants in the country concerned consider that bribe quite inappropriate. Table A1 presents these indices for all scenarios related to bribes.

Table A1: Prescriptive Norms

| | *NL* | *RS* | *IT* | *CH* |
|---|---|---|---|---|
| | mean | mean | mean | mean |
| Score: 4, bribe: 0 | 0.50 | 0.02 | 0.38 | 0.25 |
| Score: 4, bribe: 3 | -0.06 | -0.29 | -0.13 | -0.27 |
| Score: 4, bribe: 7 | -0.21 | -0.15 | -0.23 | -0.15 |
| Score: 12, bribe: 0 | 0.30 | 0.19 | -0.05 | 0.35 |
| Score: 12, bribe: 3 | 0.23 | 0.42 | 0.18 | 0.08 |
| Score: 12, bribe: 7 | 0.03 | 0.33 | 0.03 | 0.10 |
| Score: 20, bribe: 0 | 0.21 | 0.56 | -0.42 | 0.58 |
| Score: 20, bribe: 3 | 0.11 | 0.44 | -0.17 | 0.30 |
| Score: 20, bribe: 7 | 0.13 | 0.27 | 0.30 | 0.23 |
| Observations | 39 | 32 | 40 | 40 |

Recall from the main text that we normalize these indices by comparing bribe scenarios to the zero bribe cases. Table A2 summarizes these normalized index in all four countries.

Table A2: Normalized Prescriptive Norms

| Score | Bribe | NL | RS | IT | CH |
|---|---|---|---|---|---|
| 4 | 3 | −0.56 | −0.31 | −0.52 | −0.52 |
| | 7 | −0.72 | −0.17 | −0.62 | −0.40 |
| 12 | 3 | −0.07 | 0.23 | 0.23 | −0.27 |
| | 7 | −0.27 | 0.15 | 0.08 | −0.25 |
| 20 | 3 | −0.10 | −0.13 | 0.25 | −0.28 |
| | 7 | 0.09 | −0.29 | 0.72 | −0.35 |

*Notes*: Numbers in the cells give the mean appropriateness of the bribe concerned, for the given score *minus* the mean appropriateness of giving no bribe at that score.

Consider first a performer with a poor score of 4 (below the average performance of 12). Here, the pattern is similar across countries. Bribing is considered less appropriate than not bribing (the normalized index is negative in all countries for both bribe levels). The effect is about twice as strong in $NL$ and $IT$ than in $RS$, with $CH$ in between. These effects are statistically significant, except for a bribe of 7 in $RS$ (PtT, $p < 0.05$ for all except $RS$, where $p = 0.39$). The normalized index is insignificantly different between bribes of 3 and 7 in all countries (PtT, all $p > 0.10$). Moreover, for both bribe levels all pairwise comparisons between countries are statistically indistinguishable (PtT, $p > 0.10$) except the comparison between $NL$ and $RS$ for a bribe of 7 (PtT, $p = 0.08$).

When performance is average (a score of 12) bribing becomes more acceptable in all countries. In fact, the only significant difference (PtT, $p = 0.01$) with a bribe of zero appears for a bribe of 3 in $CH$, where bribing is still considered to be less appropriate than not bribing. For all other countries, $p > 0.10$ so there the social norms concerning bribing 3 or bribing nothing are indistinguishable. Across countries, bribing 3 is considered significantly less appropriate in $CH$ than in $RS$ and $IT$ (PtT, $p < 0.01$ in both cases). All other country differences are statistically insignificant (PtT, $p > 0.17$). For a bribe of 7, only the difference between $RS$ and $CH$ is marginally significant (PtT, $p = 0.10$); for all other comparisons $p > 0.13$.

Finally, when performance is high (20), bribing is again deemed more appropriate than not bribing in $IT$ (PtT, $p = 0.07$ for a bribe of 3; $p < 0.01$ for a bribe of 7). The reverse still holds for $CH$ (PtT, $p = 0.04$ for a bribe of 3; $p = 0.05$ for a bribe of 7). The Dutch ($NL$) are now indifferent about the appropriateness of bribing versus not bribing (PtT, $p > 0.1$ for both bribe levels).[32] An interesting case is $RS$. While they consider bribing inappropriate compared to not bribing for low performers (a score of 4) and appear to be indifferent for average performers, they revert to finding it relatively inappropriate for high performers. This effect is, however, insignificant for a bribe of 3 (PtT, $p = 0.32$) and only marginally significant for a bribe of 7 (PtT, $p = 0.06$). The pattern does suggest that Russians may feel that bribery is inappropriate for those who deviate from average performance.[33] Across countries, $IT$ clearly stands out. For a bribe of 3, the differences with $NL$, $RS$, and $CH$ are all significant (PtT, $p = 0.09$, $p = 0.05$, $p < 0.01$, respectively). The differences are even stronger for a bribe of 7 (PtT, $p < 0.01$ for all comparisons). All other country comparisons are statistically insignificant (PtT, all $p > 0.34$).

Next, consider judges' decisions. All situations reflect cases where performer A outperforms performer B (20 *vs.* 12). Table A3 shows the measured appropriateness indices. The top panel shows appropriateness scores for situations where A receives the prize, and in the lower panel B is chosen as winner.

For $NL$, $RS$, and $CH$, it is immediately clear that it is deemed appropriate to award the prize to A, the better performer (all numbers in the top panel are positive and all number in the

[32]This might be because the pool of participants in Amsterdam comes from a variety of countries, including Dutch (6 participants), Italian (1), Russian (3) and Chinese (4). Groups are too small, however, to perform statistical tests across subgroups.

[33]This is reminiscent of the finding for Russia reported in Gächter and Herrmann (2007). In their public good games with punishment, people are punished for any deviation from the average contribution, not just for free riding.

Table A3: Prescriptive norms: judges' behavior

| | NL | RS | IT | CH |
|---|---|---|---|---|
| Judge nominates A | | | | |
| A bribes: 7, B bribes: 3 | 0.66 | 0.88 | 0.35 | 0.73 |
| A bribes: 3, B bribes: 0 | 0.61 | 0.88 | 0.50 | 0.72 |
| A bribes: 3, B bribes: 7 | 0.28 | 0.21 | -0.13 | 0.63 |
| A bribes: 0, B bribes: 3 | 0.32 | 0.33 | -0.23 | 0.62 |
| Judge nominates B | | | | |
| A bribes: 7, B bribes: 3 | -0.50 | -0.69 | -0.22 | -0.73 |
| A bribes: 3, B bribes: 0 | -0.62 | -0.79 | -0.38 | -0.67 |
| A bribes: 3, B bribes: 7 | -0.13 | -0.23 | 0.15 | -0.47 |
| A bribes: 0, B bribes: 3 | -0.23 | -0.33 | 0.13 | -0.45 |
| Observations | 39 | 32 | 40 | 40 |

*Notes*: The table reports the index of social appropriateness. 1=very socially appropriate. -1 = very socially inappropriate. In all cases, A scores 20 and B scores 12.

lower panel are negative).[34] In $IT$, the norms appear to be different. Here, it is deemed most appropriate that the prize is awarded to the performer who bribes more (the index is negative if the judge gives the prize to the performer with the lower bribe and positive if the opposite is true, irrespective of A's better performance).

Our main interest lies in the case where the judge is corrupt. As explained in the main text, this occurs in cases when the lower performer (here, B) is rewarded after giving a higher bribe. This is the case (only) for the lower two rows of table A3. We first note that for all countries the difference between Bribes of 0 (A) and 3 (B) as opposed to 3 (A) and 7 (B) is statistically insignificant (PtT, all $p > 0.32$). For bribes of 3 and 7 corruption is deemed significantly more inappropriate in $NL$, $RU$, and $CN$ than in $IT$ (PtT, $p = 0.06$, $p = 0.01$, $p < 0.01$, respectively). All other country comparisons are statistically insignificant (PtT, all $p > 0.20$). For bribes of 0 and 3, corruption is deemed significantly more inappropriate in $CN$ than in $NL$ (PtT, $p = 0.04$) or $IT$ (PtT, $p < 0.01$). The difference between $IT$ and $RS$ is also significant (PtT, $p = 0.04$). All other country comparisons are statistically insignificant (PtT, all $p > 0.12$).

[34]Nevertheless, bribes do matter in $NL$, $RS$, and $CH$. The appropriateness index of giving the prize to A diminishes if B bribes more than A. Similarly, the *in*appropriateness of giving the prize to B diminishes if B bribes more than A.

# F Regressions for hypothesis 5

To test Hypothesis 5, we run the regression of eq. 2 separately for the first and second halves of the experiment. The results are presented in Tables A4 and A5.

Table A4: Bribes: High and Low information, first 5 periods

| | Netherlands | Russia | Italy | China | |
|---|---|---|---|---|---|
| $\beta_1$ (group contagion) | 1.066 | 1.428*** | 1.345*** | 0.948 | 1.241*** |
| Group average bribe - Own bribe (previous period) | (0.088) | (0.149) | (0.157) | (0.299) | (0.087) |
| p-value permutation test | 0.157 | 0.002 | 0.003 | 0.569 | 0.000 |
| $\beta_2$ (group conformism) | -1.155 | -1.174 | -1.112 | -1.158 | -1.149 |
| Own bribe - Group average bribe (previous period) | (0.156) | (0.067) | (0.179) | (0.151) | (0.048) |
| p-value permutation test | 0.490 | 0.462 | 0.572 | 0.198 | 0.387 |
| $\beta_3$ (competitor contagion) | 0.464 | 0.464*** | 0.477** | 0.096 | 0.363 |
| Competitor bribe - Own bribe (previous period) | (0.179) | (0.096) | (0.157) | (0.119) | (0.086) |
| p-value permutation test | 0.607 | 0.009 | 0.022 | 0.963 | 0.109 |
| $\beta_4$ (competitor conformism) | -0.676* | -0.712 | -0.658 | -0.736 | -0.668 |
| Own bribe - Competitor bribe (previous period) | (0.139) | (0.082) | (0.170) | (0.114) | (0.062) |
| p-value permutation test | 0.077 | 0.821 | 0.864 | 0.366 | 0.749 |
| $\beta_5$ (competitor contagion) | -0.550 | -0.574* | -0.429 | -0.166 | -0.461 |
| [Competitor bribe - Own bribe (previous period)]*treatment | (0.181) | (0.159) | (0.182) | (0.227) | (0.101) |
| p-value permutation test | 0.377 | 0.055 | 0.158 | 0.902 | 0.119 |
| $\beta_6$ (competitor conformism) | 0.631 | 0.836 | 0.741 | 0.624 | 0.667 |
| [Own bribe - Competitor bribe (previous period)]*treatment | (0.153) | (0.164) | (0.281) | (0.147) | (0.083) |
| p-value permutation test | 0.258 | 0.204 | 0.567 | 0.411 | 0.368 |
| $\beta_7$ | -0.183 | 0.448 | -0.317 | -0.249 | -0.234 |
| Treatment dummy | (0.657) | (0.403) | (0.390) | (0.399) | (0.207) |
| $\beta_8$ | 0.589 | 0.304 | 0.929** | -0.865* | 0.246 |
| Unfair judge previous period | (0.447) | (0.263) | (0.304) | (0.419) | (0.210) |
| $\beta_9$ | 0.224** | 0.034 | -0.044 | 0.152*** | 0.125*** |
| Own performance in previous period | (0.087) | (0.069) | (0.063) | (0.048) | 0.041 |
| Observations | 384 | 392 | 384 | 380 | 1540 |

*Notes:* Standard errors (clustered by matching group) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include 23 personal characteristics.

Table A5: Bribes: High and Low information, last 5 periods

| | Netherlands | Russia | Italy | China | |
|---|---|---|---|---|---|
| $\beta_1$ (group contagion) | 0.894 | 0.953 | 1.321** | 1.231 | 1.088** |
| Group average bribe - Own bribe (previous period) | (0.186) | (0.169) | (0.150) | (0.135) | (0.098) |
| p-value permutation test | 0.441 | 0.187 | 0.033 | 0.100 | 0.018 |
| $\beta_2$ (gropu conformism) | -1.068 | -1.118 | -1.095 | -0.940 | -1.058 |
| Own bribe - Group average bribe (previous period) | (0.139) | (0.168) | (0.117) | (0.057) | (0.055) |
| p-value permutation test | 0.607 | 0.531 | 0.327 | 0.606 | 0.547 |
| $\beta_3$ (competitor contagion) | 0.440 | 0.600*** | 0.431 | 0.212 | 0.402** |
| Competitor bribe - Own bribe (previous period) | (0.065) | (0.142) | (0.087) | (0.135) | (0.066) |
| p-value permutation test | 0.236 | 0.000 | 0.120 | 0.905 | 0.013 |
| $\beta_4$ (competitor conformism) | -0.704 | -0.652 | -0.744 | -0.927*** | -0.770 |
| Own bribe - Competitor bribe (previous period) | (0.053) | (0.149) | (0.093) | (0.154) | (0.067) |
| p-value permutation test | 0.244 | 0.937 | 0.305 | 0.002 | 0.100 |
| $\beta_5$ (competitor contagion) | -0.277 | -0.712*** | -0.637** | -0.390 | -0.477* |
| [Competitor bribe - Own bribe (previous period)]*treatment | (0.094) | (0.158) | (0.107) | (0.161) | (0.081) |
| p-value permutation test | 0.856 | 0.003 | 0.033 | 0.462 | 0.062 |
| $\beta_6$ (competitor conformism) | 0.508 | 0.600 | 0.738 | 0.830* | 0.666 |
| [Own bribe - Competitor bribe (previous period)]*treatment | (0.066) | (0.216) | (0.136) | (0.162) | (0.088) |
| p-value permutation test | 0.598 | 0.698 | 0.295 | 0.098 | 0.309 |
| $\beta_7$ | -0.055 | 0.399 | -0.168 | -0.785 | -0.195 |
| Treatment dummy | (0.420) | (0.411) | (0.369) | (0.468) | (0.211) |
| $\beta_8$ | -0.840* | -0.846** | -0.722** | 0.101 | -0.600*** |
| Unfair judge previous period | (0.465) | (0.307) | (0.324) | (0.264) | (0.188) |
| $\beta_9$ | 0.217** | 0.057 | -0.032 | 0.132* | 0.139*** |
| Own performance in previous period | (0.077) | (0.074) | (0.091) | (0.062) | 0.045 |
| Observations | 480 | 490 | 480 | 475 | 1925 |

*Notes:* Standard errors (clustered by matching group) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include 23 personal characteristics.

# G Corruption opportunities

In this appendix, we provide an overview of the situations in which judges have the possibility to make a corrupt decision. Recall that this occurs when one of the performers has a better performance and the other bribes more. Table A6 summarizes all possible cases and reports the number of observations in each. A few interesting things can be noted. First, corruption is possible in 25.2%, 29.0%, 35.6%, and 30.8% of the cases in $NL$, $RS$, $IT$, and $CH$, respectively.

Second, the cases where one performer has a higher score than the other (406, 403, 402, 406, respectively) is more or less the same across countries.

Table A6: **Possibility of corruption: distribution**

| Case | | Country | | | | Possibility of corruption |
|---|---|---|---|---|---|---|
| | | NL | RS | IT | CH | |
| equal performance $P_i = P_j$ | equal bribe $B_i = B_j$ | 14 | 28 | 10 | 12 | corruption not possible |
| | unequal bribe $B_i \neq B_j$ | 60 | 59 | 68 | 62 | corruption not possible |
| unequal performance $P_i \neq P_j$ | equal bribe $B_i = B_j$ | 69 | 89 | 63 | 66 | corruption not possible |
| | player with higher performance bribes more | 216 | 172 | 168 | 192 | corruption not possible |
| | player with higher performance bribes less | 121 | 142 | 171 | 148 | corruption possible |
| Total number of observations | | 480 | 490 | 480 | 480 | |

*Notes: Cell entries give the number of observations for each situation and country.*

Third and interestingly, when one performer scores better than the other and the bribes differ, then the fraction of times that the better performer also bribes more differs across countries. This fraction is 0.64 in $NL$, 0.55 in $RS$, 0.50 in $IT$, and 0.57 in $CH$. We use two-sided binomial tests to investigate whether these fraction differ from 50%. The results show that the fraction is significantly different than 50% in $NL$ ($p < 0.01$) and $CH$ ($p = 0.02$). In $RS$ ($p = 0.10$) and $IT$ ($p = 0.91$), however, when one performer scores better than the other, she is equally likely to bribe more or less than this other performer. This suggests that there is a tendency in $NL$ and $CH$ to avoid situations where the judge might act corruptively, by 'outbribing' the other if one outperforms her. In $RS$ and $IT$ there is no relationship between having the better performance and the higher bribe. Recall that our prescriptive norm measurements in $RS$ and $IT$ show little evidence of norms that find bribing inappropriate (see Table 1 in the main text). This is consistent with our finding here, that 'winning the bribe' is unrelated to relative performance in $RS$ and $IT$.