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Conditional bribery: Insights from incentivized experiments across 18 nations

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Bribery, a grand global challenge, often occurs across national jurisdictions. Behavioral research studying bribery to inform anticorruption interventions, however, has merely examined bribery within single nations. Here, we report online experiments and provide insights into crossnational bribery. We ran a pilot study (across three nations) and a large, incentivized experiment using a bribery game played across 18 nations (N = 5,582, total number of incentivized decisions = 346,084). The results show that people offer disproportionally more bribes to interaction partners from nations with a high (vs. low) reputation for foreign bribery, measured by macrolevel indicators of corruption perceptions. People widely share nation-specific expectations about a nation's bribery acceptance levels. However, these nation-specific expectations negatively correlate with actual bribe acceptance levels, suggesting shared yet inaccurate stereotypes about bribery tendencies. Moreover, the interaction partner's national background (more than one's own national background) drives people's decision to offer or accept a bribe—a finding we label *conditional bribery*.

corruption | social norms | crosscultural | bribery | behavioral science

Significance

Bribery across nations substantially impedes sustainable economic and human development, leading to increased death tolls following natural disasters, accelerating biodiversity loss, and impairing efforts to halt climate change. Although experimental insights have gained popularity in fighting bribery, insights into bribery across nations are lacking altogether. Our results show that people are conditionally corrupt: They offer bribes based on their partners' national backgrounds for whom they hold inaccurate corruption stereotypes.

Corruption poses an immense challenge to achieving sustainable economic and human development (1, 2), leading to increased death tolls following natural disasters (3), accelerating the loss of biodiversity (4), and impairing efforts to halt climate change (5). In a globalizing world, bribery—the most common form of corruption—frequently spans across national borders. Selected prominent examples include Europe's largest industrial manufacturing company, Siemens, executing a systematic scheme of paying bribes to secure public contracts abroad (6). The recent carwash ("Lava Jato") investigation—widely considered the world's largest corruption scandal—revealed vast bribery schemes across South America. In addition, in 2020, Airbus agreed to pay a record-breaking fine of over $3.9 billion to resolve foreign bribery allegations (7).

Crossnational bribery not only occurs in such high-profile cases but increasingly involves average employees and citizens (8, 9). Since the introduction of the Foreign Corrupt Practices Act in 1977, outlawing bribery across national borders, documented cases have been rising (10). With business globalizing, more and more companies are trading across national jurisdictions, and their staff is becoming increasingly international. Outside the business context, the upsurge of worldwide travel and migration exposes average citizens to interactions with foreign public officials, enabling crossborder bribery (11). For example, citizens have crossed borders to illicitly obtain internationally recognized documents, such as COVID-19 vaccination certificates (12).

Although considerable conceptual (13, 14) and experimental work (15–18) has studied bribery within single nations, empirical insights into bribery across nations rely on self-report measures or expert surveys (19–21, review: 22). Such measures are valuable, but self-reported perceptions of corruption often diverge from corruption realities (23). As bribery instances are difficult to validate and are not always reported, systematically understanding its causal underpinnings in field settings is challenging. People experienced in bribery may also cover up their actions, leading to selective data availability (review: 24). Experiments with economic games help to gain controlled yet generalizable insights into how behavior is shaped by psychological aspects, such as expectations concerning the interaction partner's behavior and beliefs about their society.

Materials and Methods

Our study expands on prior research that examined unethical decision-making at an individual level in various nations (25, 26) by shedding light on bribery across different nations. We furthermore assess the influence of expectations about one's interaction partner's bribery behavior. To do so, we ran large online experiments using an incentivized bribery game. This game differs from standard cheating tasks (27–29) that have been used to assess variations in individual dishonesty across the globe (25, 26), as it involves a transaction between multiple agents.

Author contributions: A.R.D., N.K., B.I., S.S., and A.G. designed research; A.R.D. and N.K. performed research; A.R.D. analyzed data; and A.R.D., N.K., B.I., S.S., and A.G. wrote the paper.

The authors declare no competing interest.

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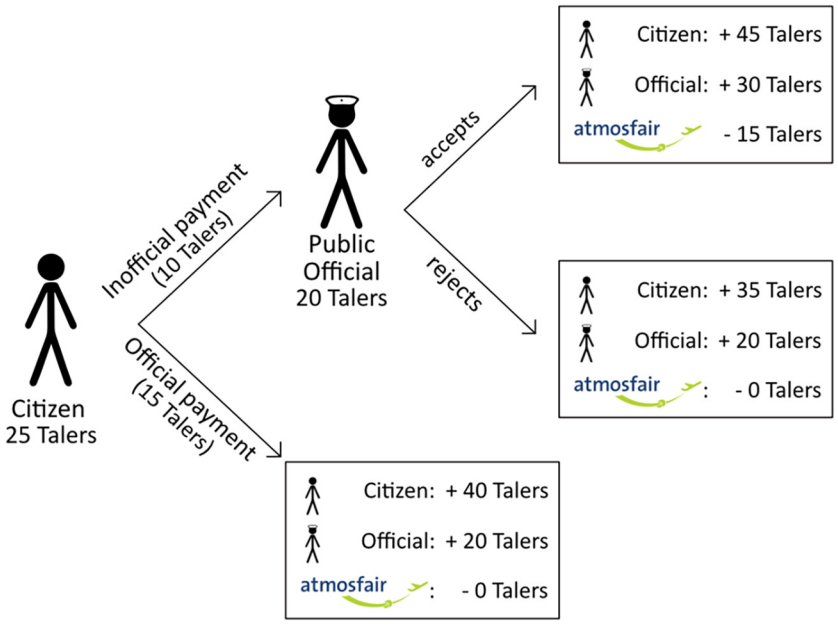

Fig. 1. Outline of the illustrated game tree of the bribery game. Participants took part in the game as both citizen players and public official players for their respective nations.

The bribery game seeks to reflect the structural characteristics of bribery transactions (30). The game entails the role of a "citizen" seeking to obtain a license and a "public official" entrusted with the power to grant that license (Fig. 1). Citizens in our experiment could either obtain the license by making an official payment or by offering an "unofficial payment," which we refer to as offering a bribe henceforth. The public officials, in turn, could either accept or reject the unofficial payment, which we refer to as accepting bribes.

Note that the game contains an interdependent structure in that the citizens' outcomes are not determined by their own decisions only. Citizens' outcomes depend on their own choice of whether to offer a bribe and the matched public official's choice of whether to accept it. In contrast, public officials' decisions do not contain uncertainty, as accepting bribes always increases their payoffs compared to rejecting them. Therefore, the game also entails an asymmetry between public officials and citizens, which is characteristic of bribery transactions. This asymmetry is also reflected in the payoffs. The public officials' decisions to accept or reject a bribe directly influence the citizens' payoffs by 15 Talers, while the citizens' decision to offer a bribe or not can only influence the public officials' payoffs by 10 Talers. We converted the game's currency of Talers to national currency at a rate corresponding to 1 Taler = € 0.05.

Participants took part in the bribery game as citizens and public officials. In the first block, they took the role of the citizen. As citizens, they decided 18 times–once for each nation in the sample–whether to offer a bribe. The order of nations was randomized for each participant. In the second block, participants were asked to take the role of a public official. They decided 18 times whether to reject or accept a bribe, with all of the nations again presented in a newly randomized order for each participant. Note that participants were not asked to pretend to be from another nation when taking part as citizens and public officials. In the main study, participants thus made a total of 36 bribery decisions (18 × bribe offers; 18 × bribe acceptance) for each of the matched nations, including their own.

Although mutually beneficial for a citizen–public official pair, participants understood that offering and accepting bribes produced a cost for society. Namely, each time a bribe was offered and accepted, we deducted a donation to a nongovernmental organization (NGO) engaged in the fight against climate change (in trials randomly chosen for pay). We chose a globally operating NGO working on climate issues (i.e., atmosfair) because a) negative externalities about climate affect citizens globally, and b) previous research has documented that corruption exacerbates pollution and climate change (5, 31). To control for differences concerning the approval of the NGO that suffered the costs of bribery, we assessed people's views about the NGO. Importantly, the conclusions for all main results remain the same when controlling for approval of atmosfair's work (*SI Appendix*, Tables S13 and S14). Although for logistic reasons (e.g., different time zones), the game could not be played simultaneously, we conducted the study within a short succession of 3 wk in all nations. To do so, we used the strategy method (32). Hence, participants made all decisions without receiving feedback about their interaction partners' behavior.

We recruited representative samples (in terms of age and gender) from 21 nations (pilot with three nations: $N = 890$, $M_{Age} = 40.61$, $SD_{Age} = 12.75$, 50.44% = female; main study with 18 nations: $N = 5{,}582$, $M_{Age} = 40.11$, $SD_{Age} = 12.82$, 50.07% = female) via the online panel provider Toluna (https://www.toluna.com). To allow for a broad investigation, we selected nations that spanned the whole spectrum of bribery prevalence according to the only available perception-based index on bribery across nations: Transparency International's Bribe Payers Index (BPI, see an overview of scores in *SI Appendix*, Table S3). The included nations account for 57% of the world's population and 79% of the world's Gross Domestic Product (GDP). Further details about the sample composition and administered languages are presented in *SI Appendix*, Table S2.

We elicited incentivized nation-specific expectations* after each decision to offer and accept bribes. Specifically, when deciding as citizens, participants estimated the percentage of public officials from a given nation that accepted bribes (in 10% brackets, e.g., 0 to 10%). When deciding as public officials, participants estimated the percentage of citizens that offered bribes. These nation-specific expectations were incentivized as participants could earn a bonus of 35 Talers (= € 1.75) if they correctly estimated the 10% bracket. For the analyses reported here, we transformed the 10%-brackets (e.g., 21 to 30%) to the midpoint of the bracket (e.g., 25%, see more details *SI Appendix, Nation-specific Expectations*).

To implement payoffs, we matched each participant with one randomly chosen interaction partner. For each pair, we randomly determined whether nation-specific expectations or bribery decisions were relevant to the bonus payment. In case the bribery decisions were chosen, we randomly determined the roles of both participants in the pair. We then calculated the bonus payment in the payoff-relevant matchings based on the indicated decisions or nation-specific expectations for that pair. We did this matching after all national samples were collected. On average, the study took 25 min to complete. The University of Cologne's and the University of Amsterdam's ethical review boards approved the pilot study and the data collection of the main study. Participants provided informed consent before completing any measures. Data, materials, and analysis code to reproduce analyses are available on the Open Science Framework via https://osf.io/xc9qf/.

We conducted a preregistered pilot study ($N = 890$) with three nations (Germany, Mexico, and Spain), which first indicated differences in bribery

*For an overview of formal definitions for all terms used, see section *SI Appendix, Glossary*.

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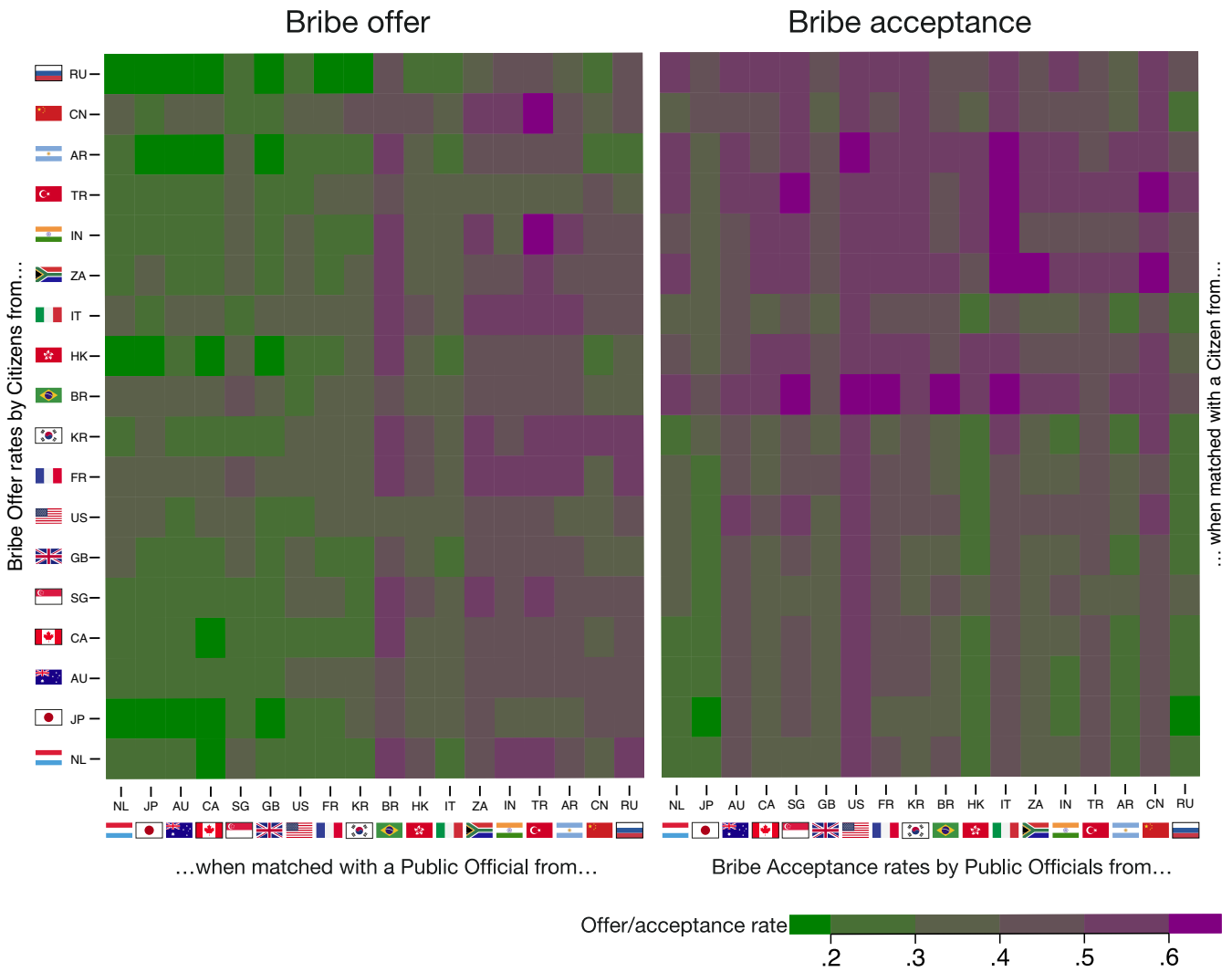

Fig. 2. Heatmap showing overall bribery levels across all 18 nation matchings, with the nations ordered in ascending order according to Transparency International's Bribe Payers Index. Color coding ranges from green (<10% bribery) to purple (=60% bribery). Left pane: The decisions to offer bribes as citizens for participants from the nations depicted on the *Y* axis when matched with the public officials from the nations depicted on the *X* axis. Right pane: The decision to accept bribes as public officials by participants from nations depicted on the *X* axis when matched with citizens from nations depicted on the *Y* axis. Nation abbreviations: NL = Netherlands; JP = Japan; AU = Australia; CA = Canada; SG = Singapore; GB = Great Britain; US = United States of America; FR = France; KR = South Korea; BR = Brazil; HK = Hong Kong; IT = Italy; ZA = South Africa; IN = India; TR = Turkey; AR = Argentina; CN = China; RU = Russia.

between and across nations. For brevity, we focus on the main study results with 18 nations ($N = 5{,}582$) in the main manuscript (for details concerning the results of the pilot study, see *SI Appendix, Results Pilot Study*).

Results

In line with the intention to measure corrupt behavior, participants, on average, perceived offering ($M = 5.27$, on a scale from 1 to 7) and accepting the unofficial payment ($M = 5.41$) as corrupt. Ratings were higher than the midpoint of the scale (= 4) in all nations in our sample (all Ps < 0.001). Further evidence substantiating the external validity of the behavioral assessment of bribery stems from parochial bribe offer rates (= percentage of citizens that offer bribes to compatriots). Such parochial bribe offer rates strongly correlate with the largest and most recent survey data on the *stated experience* of bribery within a given nation measured by Transparency International's Corruption Barometer (Spearman's rank: $r(15) = 0.56$, $P = 0.019$).[†]

[†]Since Singapore is not included in the Corruption Barometer, this analysis rests on 17 instead of 18 observations.

Moving beyond parochial bribery, we first take a bird's eye view of overall bribery rates across all nation pairings (see heatmap, Fig. 2). The left pane depicts the bribe offer rates by citizens from different nations (y-axis) when matched with public officials from different nations (x-axis). The right pane depicts the bribe acceptance rates for public officials from different nations (x-axis) when matched with citizens from different nations (y-axis). The offer and acceptance rates differ substantially across nation pairings. As a result, the overall successful bribery rates—i.e., the product of offer and acceptance rates—vary substantially too, ranging from 0.042 (Canadian citizens × Japanese public officials) to 0.291 (Korean citizens × Chinese public officials). Hence, specific nation pairings lead to significantly more bribery (up to an increase by a factor of 7) and thus imply more societal costs than others.

Bribe Offers. Depending on the national background of the citizens, substantial differences in bribe offer rates occur. Average bribe offer rates by citizens in the highest bribing nation (i.e., France: 42.10%) are (in relative terms) 59% higher than in the lowest (i.e., Russia: 26.60%, see Fig. 3, black dots). On top of

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that, we observe that the public officials' national background systematically shapes bribe offer rates. Indian public officials receive bribe offer rates almost twice as high (49.28%; highest nation) as public officials from Canada (24.51%; lowest nation). In line with our preregistered predictions, citizens from a given nation are quite consistent in their bribe-offer behavior to other nations, i.e., they largely agree about which nations to offer bribes to. This pattern occurs across all nations (intraclass correlation with 18 "raters" and 18 "targets:" ICC = .79, $P < .001$).

Next, we analyze whether public officials from nations with a high foreign bribery reputation are offered more bribes. As a proxy for foreign bribery reputation, we use a nation's rank on the BPI (20). The BPI assessed business executives' perceptions about the likelihood of companies from 28 of the world's leading economies to pay bribes abroad. As Fig. 3 displays, citizens offer more bribes to public officials from nations with a high (red to yellow symbols) compared to low (green symbols) foreign bribery reputation. For example, public officials from India, a nation with a high foreign bribery reputation, consistently receive high bribe offer rates. Bribe offer rates toward a given nation highly correlate with that nation's rank on the BPI ($r(16) = 0.81$, $P < .001$; see *SI Appendix*, Table S6, for preregistered analyses).

We also examine how foreign bribery reputation affects the actual success of bribery transactions, that is, whether bribes are offered *and* accepted. We ran exploratory simulations with 10,000 repetitions in which we randomly matched participants' decisions from all the 18 nations and in both roles (citizen and public official). The results similarly reveal that substantial differences across nations exist and that the actual "success" of bribery transactions increases with the foreign bribery reputation of one's interaction partner (*SI Appendix, Simulations on Successful Bribery Transactions*).

Expectations about Bribe Acceptance. It is plausible that foreign bribery reputations influence expectations about whether a matched public official will accept a bribe. Our analysis drawing on nation-specific expectations of bribe acceptance (elicited after each bribe offer) corroborates this view. For one, confirming our preregistered predictions, citizens from a given nation largely agree in their nation-specific expectations about bribe acceptance (intraclass correlation of expectations with 18 "raters" and 18 "targets" = 0.68, $P < 0.001$). Moreover, these nation-specific expectations about bribe acceptance for a public official from a given nation highly correlate with that nation's foreign bribery reputation ($r(16) = 0.84$; $P < 0.001$, see *SI Appendix, Pre-registered Analyses*). Such nation-specific expectations about bribe acceptance shape bribe offers, partially mediating the effect of foreign bribery on bribe offers (24% mediation of the total effect, $P < 0.001$, see *SI Appendix*, Fig. S3). Thus, foreign bribery reputation informs strategy-relevant behavioral expectations in the game.

Yet, are nation-specific expectations about bribe acceptance accurate? Our design allows us to compare participants' nation-specific expectations about bribe acceptance with a given nation's actual bribe acceptance rate. We find that nation-specific expectations are rather inaccurate and mostly miscalibrated. In fact, citizens' nation-specific *expectations* about bribe acceptance rate and *actual* bribe acceptance rate are even negatively correlated ($r(322) = -0.163$, $P = 0.003$; partial correlation corrected for citizens' nation effects: $r_{part}(305) = -0.209$, $P = 0.004$, see Fig. 4).

Foreign bribery reputations help to explain the direction of these miscalibrated expectations. People systematically underestimate bribery acceptance rates for many nations with a low foreign bribery reputation (see Fig. 4, green symbols). For example, whereas participants over all nations expected 42% of US public officials to accept bribes, in reality, US public officials accepted 56% of bribe offers.

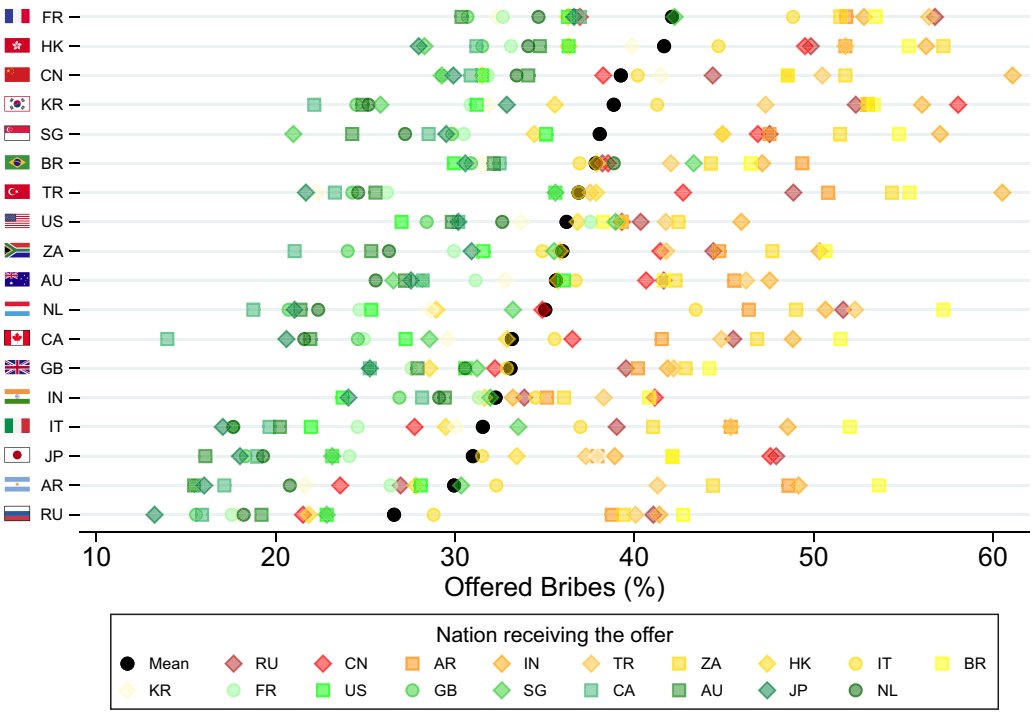

Fig. 3. Offered bribes across nations showing that bribe offers correspond with national reputations for bribery. Bribe offers for all combinations of citizens' and public officials' nations. The *Y* axis depicts the mean-sorted citizens' nations (i.e., the one making the bribe offer). The symbols and labels represent public officials' nations (i.e., the one receiving the bribe offer). The public officials' nations (see legend) are sorted by their rank in Transparency International's Bribe Payers Index, with RU being the nation with the lowest rank (i.e., dark red; highest corruption) and NL being the nation with the highest rank (i.e., dark green; lowest perceived bribery). Nation codes: RU = Russia; CN = China; AR = Argentina; IN = India; TR = Turkey; ZA = South Africa; HK = Hong Kong; IT = Italy; BR = Brazil; KR = South Korea; FR = France; US = United States of America; GB = Great Britain; SG = Singapore; CA = Canada; AU = Australia; JP = Japan; NL = Netherlands. Symbol explanation: diamonds depict Asian nations, circles represent European nations, and squares depict other nations.

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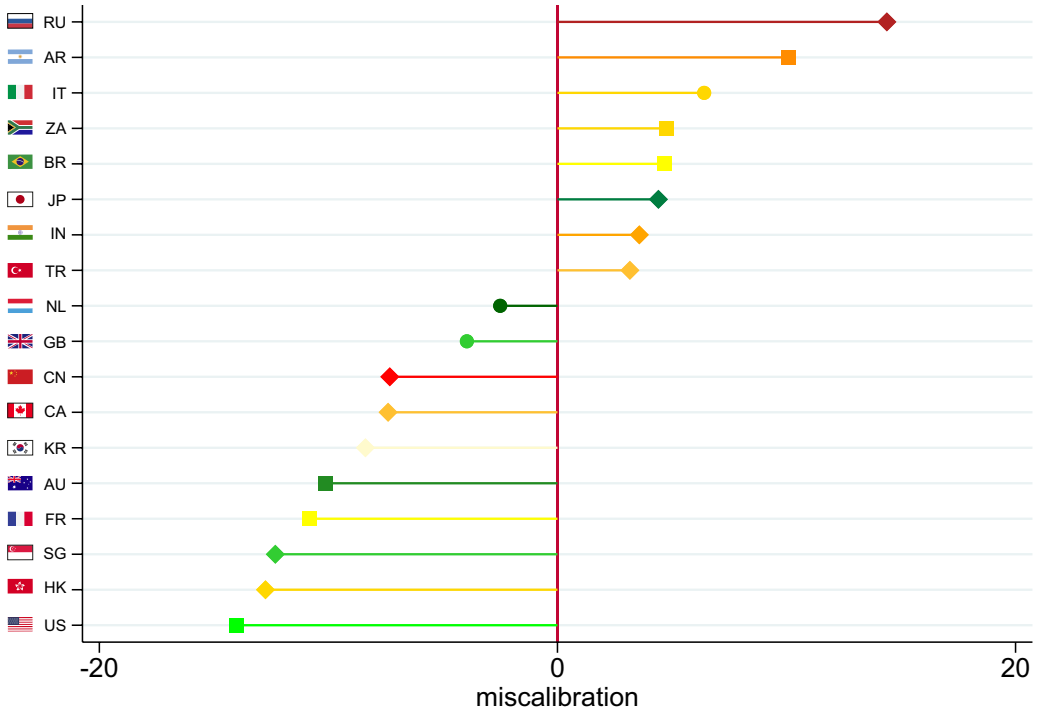

Fig. 4. Cleveland dot plot depicting people's miscalibration between the average expected and actual acceptance rates of bribery. The vertical red line represents when nation-specific expectations about bribe acceptance for a nation correspond with average bribe acceptance rates for that nation. The *y*-axis displays the nation that (is expected to) accept/s the offer. The lines connecting the dots and the vertical red line represent the inaccuracy of expectations—i.e., the deviation from the accurate expectation. Actual acceptance rates represent the percentage of participants in a nation who accepts a bribe offer. Positive values (right side from red vertical line) indicate an overestimation of bribe acceptance in percentage points, and negative values (left side from the red vertical line) indicate an underestimation. The nations are depicted in colors representing their rank in Transparency International's Bribe Payers Index, with RU being the lowest rank (i.e., dark red; highest corruption) and NL being the nation with the highest rank (i.e., dark green; lowest perceived bribery). Nation codes: RU = Russia; CN = China; AR = Argentina; IN = India; TR = Turkey; ZA = South Africa; HK = Hong Kong; IT = Italy; BR = Brazil; KR = South Korea; FR = France; US = United States of America; GB = Great Britain; SG = Singapore; CA = Canada; AU = Australia; JP = Japan; NL = Netherlands. Symbol explanation: diamonds depict Asian nations, circles represent European nations, and squares depict other nations.

The inverse pattern emerges for nations with a high foreign bribery reputation (red symbols in Fig. 4), such as Russia. Here, actual bribe acceptance rates (33%) markedly undercut the citizens' nation-specific expectations about bribe acceptance rates (47%). Our results thus suggest that when deciding to offer bribes, citizens act based on (often inaccurate) nation-specific expectations about bribe acceptance derived from a nation's foreign bribery reputation.[‡]

People's willingness to offer bribes strongly depends on the national background of one's interaction partner. In fact, exploratory analysis reveals that the public officials' national background influences bribe offers more strongly than the citizens' own national background, explaining overall 5.32 times more variance (*SI Appendix, Bribe Offers Predicted by own vs. Interaction Partner's Nation*).

Discussion

Bribery increasingly spans national borders (33). We report a large behavioral experiment on bribery across national borders. Our results add to the theoretical work in corruption research outlining that the social act of bribery is often strongly shaped by one's interaction partner (34–37). The variability of crossborder bribery follows a predictable pattern: Foreign bribery reputation correlates with bribe offer rates in the bribery game and informs national-level expectations about bribe acceptance. Although these nation-specific expectations concerning bribe acceptance rates are shared within a given nation and across nations, they correlate negatively with *actual* bribe acceptance rates. These results suggest that nationality-based bribery stereotypes influence people's willingness to offer bribes.

Our findings corroborate recent behavioral science research indicating that social factors, such as being in a collaborative setting with another person, determine whether people break ethical rules for profit (38, 39). Indeed, our findings suggest that more than one's own national background, one's interaction partner's national background shapes people's willingness to engage in bribery, highlighting the importance of expectations for bribery behavior. This finding fits squarely with well-established theories on conditional cooperation (40, 41), outlining that people's cooperativeness hinges on their interaction partners' (expected) cooperative behavior (42, 43). We thus find important evidence for *conditional bribery* (34) in an international context. It appears that for crossborder bribery, it matters more whom people interact with than where they are from.

We acknowledge that our study investigated behavior and expectations in an incentivized but relatively abstract and anonymous game only. Further research is needed to assess how far these findings generalize, namely whether, for instance, a tourist from Australia is twice as likely to try bribing a traffic police officer in China than in Japan. Another limitation of our study might be that we used representative samples (according to age and gender). Arguably, people engaged in international corruption might not be representative of

[‡]Our results further show that foreign bribery reputation shapes not only bribe *offers* but also bribe *acceptance* rates. Public officials' nation-specific expectations about bribe offers are shared across nations (ICC = 0.69, $P < 0.001$). These nation-specific expectations about bribe offers from a given nation correlate positively with that nation's foreign bribery reputation (*SI Appendix, Pre-registered analyses* and Fig. S2). A plausible explanation for this finding is that public officials find it easier to justify accepting bribes from citizens from nations with a high reputation for foreign bribery.

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their nation's population. Only a small share of (nonrandom) people might be responsible for a large share of corruption across borders. We cannot rule out that some aggregate estimates (e.g., bribery tendencies in nations) might deviate from such opportunity-weighted means. It is, however, important to note that we are only partially interested in such level effects. Instead, we mainly focus on the effect of psychological influence factors on bribing and general cognitive mechanisms, such as the effects of stereotypes, which typically depend less on the specifics of the sample.

Moreover, we used uniform payoffs across all nations. It is a common trade-off in multinational experimental research to either fix the absolute payoff making payoffs easily comparable across nations or adjust it according to the respective nation's purchasing power accounting for international differences in currency values (27, 44). We decided to keep the absolute payoffs constant across nations to simplify the task when considering the impact on people from other nations. Calibrating the payoffs to purchasing power would have required more extensive and potentially confusing instructions to the participants. This pragmatic design choice also implies that the purchasing power of payoffs differs across nations. In our main analyses, we control for the GDP difference between two interaction partners' nations to account for these differences. In additional analyses, we controlled for the purchasing power-corrected difference between nations by using the Big Mac Index (https://www.economist.com/big-mac-index) instead of the GDP difference. These analyses confirm all the main conclusions reported here (*SI Appendix*, Tables S10 and S11 and *Differences in Purchasing Power across Nations* section).

In general, although behavior in bribery games played within one nation correlates with bribery outside the lab (16), future field research will help to establish further the external validity of the crossnational version of the bribery game used. Moreover, as a proxy for foreign bribery reputation, we relied on the only available index that specifically assessed perceptions about bribery across nations, the BPI from 2011. The index consists of a survey of business experts' views about how common international business transactions feature bribe payments. It hence focuses on foreign bribery reputation in a *corporate* context. Although "ordinary people" arguably have little insight into international corporate conventions, their bribery behavior and nation-specific expectations in our study remarkably align with this proxy for foreign bribery reputation. This finding an reveals that foreign bribery reputation might not be sensitive to specific forms of bribery, such as corporate bribery or "street-level" bribery between average citizens and (low-ranking) public officials. Furthermore, perceptions concerning foreign bribery seem to be relatively stable over time. To validate these assumptions, great potential lies in future survey research that examines people's perceptions of different forms of bribery (across nations).

With the obvious caution of suggesting policy implications from online experiments, our findings can inspire evidence-based anticorruption efforts (44). Although several international, legally binding standards to criminalize transnational bribery are in place, recent independent performance evaluations reveal decreasing levels of enforcement (8). Merely relying on legal norms often fails to curb corruption. Academics and policy organizations, such as the Organisation for Economic Co-operation and Development (OECD), increasingly emphasize that successful anticorruption efforts require an accurate human-centered perspective of specific types of corruption (45). Here, we take one step in that direction and offer experimental insights into bribery across nations. Our online experiment reveals critical psychological factors that influence the decision to offer and accept bribes. We reveal that people's willingness to offer and accept bribes varies depending on their interaction partner's national background. To counter bribery across nations, it may be helpful to assess ways of reducing international bribery stereotypes. Future anticorruption efforts can draw on a long history of research in behavioral science on the emergence of stereotypes (46) and how to change them (47, 48). Such interventions appear particularly promising in internationally operating businesses.

Data, Materials, and Software Availability. Experimental data have been deposited in Open Science Framework (https://osf.io/xc9qf/) (49). We report the pre-registrations for the pilot and main study on the Open Science Framework (https://osf.io/xc9qf/registrations) (50). We also link the material containing the instructions used in all languages (https://osf.io/x235e/) (51). The *SI Appendix* contains the English version of the experimental instructions.

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