International Journal of Public Opinion Research Vol. 0 No. 0 2019

doi:10.1093/ijpor/edz019

Research Note

Lying About Corruption in Surveys: Evidence from a Joint Response Model

Virginia Oliveros [1] and Daniel W. Gingerich [2]

[1]Political Science Department, Tulane University, USA;
[2]Department of Politics, University of Virginia, USA

Despite the progress that has been made in understanding how and why corruption manifests itself in different ways around the globe, there is still a great deal that needs to be learned about why certain individuals and not others engage in the practice. One of the obstacles to achieving this goal is misrepresentation in surveys. As is the case with other socially undesirable behaviors, survey respondents tend to underreport corrupt behavior (e.g., Lee, 1993). In some cases, concerns about potential legal jeopardy may drive misrepresentation. In others, particularly settings in which the admission of corrupt behavior would not have legal consequences, misrepresentation may be driven by respondents' desire to be perceived positively by the interviewer (impression management) (e.g., Paulhus, 1984, 1991). Note that according to either mechanism, legal jeopardy or impression management, misrepresentation about corruption is a conscious phenomenon: Respondents misrepresent their experiences with corruption and proclivities toward it, not because they are unaware what these are, but rather because they do not want others to know what they are.[1]

In settings where underreporting in surveys is due to conscious misrepresentation, there are two potential bundles of explanatory factors that are likely to contribute to its incidence: interview factors and respondent factors. Interview factors refer to survey features such as the sensitivity of the issue being asked about and the question structure or format. Respondent factors refer to the demographic and experiential characteristics of those individuals who participate in surveys. Currently, less is

All correspondence concerning this article should be addressed to Virginia Oliveros, PhD, Political Science Department, Tulane University, 6823 St. Charles Avenue, Norman Mayer Building, Room 311, New Orleans, LA 70118, USA. E-mail: volivero@tulane.edu

[1]Another potential contributor to underreporting in surveys is unconscious bias, perhaps manifesting itself in self-deception. While we believe such bias is potentially important in the study of attitudes, especially those with expansive and contested definitional scope (such as racism, xenophobia, and the like), it seems less relevant in the study of corruption, where the acts in question have more narrow and less contested definitional content.

known about how these latter factors shape the incidence of lying in surveys. More specifically, very little is known about the characteristics of respondents who are most prone to lie about corruption.

In order to address this lacuna in the literature, this article employs original survey data from Costa Rica. Given strong priors about conscious misrepresentation in surveys about corruption and related issues, recent studies have employed sensitive survey techniques (SSTs) such as the list experiment (e.g., Gonzalez-Ocantos, Kiewiet de Jonge, Meléndez, Osorio, & Nickerson, 2012), endorsement experiments (e.g., Lyall, Blair, & Imai, 2013), or the randomized response technique (e.g., Corbacho, Gingerich, Oliveros, & Ruiz-Vega, 2016). We follow suit, although, with an important innovation.

We employ a new technique, the joint response model, which allows us to generate unbiased estimates of the extent of corruption among respondents as well as the proclivity toward untruthful reporting among bearers of the sensitive trait (Gingerich, Oliveros, Corbacho, & Ruiz-Vega, 2016). The model permits one to estimate the probability of a truthful response under direct questioning which can be used to estimate the proportion of "liars" across groups.[2] Examining these estimates across a variety of different groups, we find that truthfulness under direct questioning differs by wealth, and to some degree by education, but not by gender.

To the best of our knowledge, our efforts represent the first attempt to systematically uncover the demographic factors most associated with lying in surveys about corruption. These have two important implications. Our null findings on gender imply that the voluminous research agenda on women's disinclination to engage in corruption is capturing something real: the findings of this work cannot be explained away based on the premise that women are more inclined to lie about corruption. On the other hand, our findings on wealth counsel researchers to take caution in interpreting the conditional associations between wealth and corruption in direct surveys on this topic.

Who Lies About Corruption?

In this section, we summarize the existing findings on the relationship between age, education, wealth, and gender and attitudes toward corruption, tolerance for corruption, and proclivity to engage in corrupt behavior. While we acknowledge that these are not equivalent phenomena, we use the findings across these different corruption-related outcomes to derive our hypotheses about the relationship between these four personal characteristics and proclivity to lie about corruption in surveys.

Several studies on corrupt behavior and attitudes toward corruption find that women are less tolerant of corruption and less likely to be involved in corrupt behavior than men. Using data from the World Values Survey, Swamy et al. (2001) show that women are less likely to condone corruption (see also, Dollar, Fisman, & Gatti, 2001). In the same paper, using survey data from Georgia, these authors also show that officials in firms owned or managed by men are significantly more likely to

[2]Kiewiet de Jonge (2015) uses list experiments to conduct a similar exercise on vote buying; Eady (2017) develops a new method to analyze misreporting of prejudice using the list experiment.

be involved in bribe-giving than those managed or owned by women. Similarly, both Torgler and Valev (2010) and Blake (2009) show the existence of significantly greater aversion to corruption among women. Laboratory experiments have also found that women are less corrupt than men (e.g., Rivas, 2013). Gingerich et al. (2016) find that in Costa Rica, men are substantially more likely than women to indicate a willingness to bribe as well as to indicate that they have done so in the past. One of the mechanisms offered to explain this pattern is risk aversion: Women are held to be more risk averse than men, which results in a reluctance to engage in illicit behaviors (Esarey & Schwindt-Bayer, 2018). If a relatively high level of risk aversion leads women to engage in corruption less frequently than men, then a high level of risk aversion should lead women to lie more about corruption under direct questioning. However, some experimental studies have found that women are more predisposed to tell the truth than men (Rosenbaum, Billinger, & Stieglitz, 2014). For instance, in a die-rolling experiment, women were found to be significantly less likely to misreport the true value of the die (Conrads, Irlenbusch, Rilke, & Walkowitz, 2013). Similarly, women were found to be less likely to lie about the outcome of a coin toss (Houser, Vetter, & Winter, 2012). If women are indeed more inclined to tell the truth, we would expect women to be less likely to lie about corruption under direct questioning to appear socially desirable (impression management). Since the expectations from the existing literature are mixed, we do not have clear expectations on the effect of gender on willingness to lie. *We expect women to be more (less) likely to lie about willingness to engage in corrupt behavior than men (H1, H1′).*

Less studied than gender is the effect of age on corruption and attitudes toward corruption. A few studies, however, have found significant differences between older and younger people. Torgler and Valev (2010) find that greater age is associated with both lower tolerance for corruption and for tax evasion. Similarly, Swamy et al. (2001) also find lower tolerance for corruption (bribery in their case) among older people. Blake (2009) also finds that older people are less tolerant of bribe-taking. In Costa Rica, younger survey respondents were found to be more inclined to indicate a willingness to bribe than older ones (Corbacho et al., 2016; Gingerich et al., 2016). In terms of the relationship between age and honesty, experimental studies have generally not found significant differences across different age groups (Rosenbaum et al., 2014; see Conrads et al., 2013 for an exception). We thus expect social desirability bias to be positively associated with age. *We expect older respondents to be more likely to lie about willingness to engage in corrupt behavior than younger respondents (H2).*

Another characteristic that has been found to be related to corrupt behavior and attitudes about corruption is education. Torgler and Valev (2010) find that education is negatively correlated with tolerance for corruption. In the Dominican Republic, Oliveros and Schuster (2018) find that more highly educated public sector employees are perceived to be less corrupt than those with less education. Similarly, in Costa Rica, individuals with incomplete secondary school education were found to be more inclined to bribe a police officer than individuals with some exposure to college (Corbacho et al., 2016). Botero et al. (2013) find that more highly educated people complain more about government misconduct (when it happens) than those with less education. Interestingly, Morris and Klesner (2010) find that while the more educated are more likely to experience corruption, the less educated are more likely to perceive

it. Following the literature, we expect social desirability bias to be higher among more educated respondents. *We expect more educated respondents to be more likely to lie about willingness to engage in corrupt behavior than less educated respondents (H3).*

A number of studies have found an effect of income on corruption and attitudes toward corruption. Yet, empirical findings remain mixed and contradictory. Using household data on bribery of public officials in Uganda and Peru, Hunt and Laszlo (2012) find that the rich are more likely to bribe. Both Torgler and Valev (2010) and Blake (2009) find a negative relationship between income and tolerance for corruption. Winters and Weitz-Shapiro (2013), in contrast, find greater tolerance of corruption among the upper class. This finding might be related to the fact that wealthier individuals appear to be less affected by corruption, at least regarding the type of petty corruption we study here. Indeed, in a field experiment conducted in Mexico City, Fried, Lagunes, and Venkataramani (2010) find that police officers engaging in traffic stops were more likely to demand bribes from poorer drivers. Finally, experimental studies have found no differences in honesty levels across income groups (Rosenbaum et al., 2014). Based on the mixed empirical evidence, we are agnostic about the effect of wealth on the veracity of reporting about corruption. *We expect wealthier respondents to be more (less) likely to lie about willingness to engage in corrupt behavior than poorer respondents (H4, H4′).*

Empirical Strategy

To estimate untruthful responses about corruption, we use the joint response model that combines direct questioning and an SST (Gingerich et al., 2016). Two different questions were included in the survey. The first one (Q1) asks respondents about their willingness to pay a bribe to a police officer to avoid paying a traffic ticket; the second one (Q2) asks respondents whether they had actually bribed an officer in the past to avoid paying a ticket.[3] The questions were presented twice to the respondents. First, they were presented in the format of a particular type of SST called the crosswise model (Tan, Tian, & Tang, 2009). This technique provides full anonymity to respondents by combining the response to an innocuous question (in our case, the birth month of the respondent's mother) with the response to the sensitive item (in our case, corruption). At the end of the survey, the questions about corruption were asked directly. Responses about bribing were thus a combination of responses under the protection afforded by the SST and the absence of protection under direct questioning.[4]

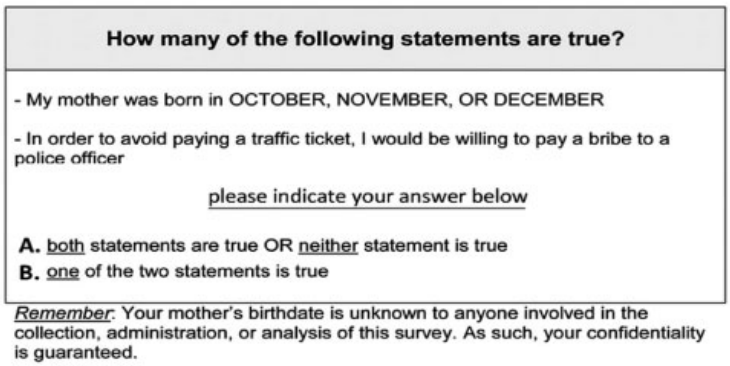
Figure 1 presents the question about the willingness to bribe based on the crosswise model. The respondents were presented with two statements and asked how many were true. The first statement refers to the respondent mother's birth month.[5] The second statement denotes a willingness to pay a bribe. The privacy of the responses

[3]We recognize that the willingness to bribe and a past history of bribery are conceptually distinct. Nevertheless, in our dataset, these two outcomes move in very similar ways with our demographic variables. Consequently, we study them jointly here. The tables we present in the main text and Supplementary Appendix contain our results dissaggrated by the specific question.

[4]For a detailed description of the technique, see Gingerich et al. (2016).

[5]To calculate the probability of having one's mother born in October, November, or December, we conducted a telephone survey ($N = 1{,}200$) and compared the responses against official data. They were essentially identical. See Supplementary Appendix.

Figure 1
Crosswise survey question on willingness to bribe a police officer



was protected by constraining the response options to only two potential responses: response A, indicating that either both statements are true or neither statement is true, and response B, indicating that only one of the two statements is true (without specifying which is true). The respondents' anonymity is guaranteed since neither of the two responses necessarily indicates willingness to bribe.

The modeling strategy rests on two key assumptions. The first is called *honesty given protection*: Given the protection afforded by the sensitive question technique, all respondents are assumed to respond as prompted by the technique (Gingerich, 2010; Blair & Imai, 2012). Thus, if lying occurs in the survey responses, it is assumed to occur only when respondents are prompted to respond directly. Note that the assumption here is not that all respondents prompted directly about the sensitive trait will lie about it, only that some proportion will, and that proportion is *ex-ante* unknown. The second assumption is called *one-sided lying*: Individuals who bear the sensitive trait may either lie about their status or refuse to respond when directly queried but those who do not bear the sensitive trait always either tell the truth or refuse to respond; they never falsely claim to bear the sensitive trait.

Exploiting these assumptions, the model permits one to estimate the prevalence of the sensitive trait or behavior, which we denote by π. In addition to the prevalence rate, the model permits one to estimate the value of a set of diagnostic parameters capturing respondent evasiveness under direct questioning. These parameters are λ_1^T, which represents the probability of a truthful response under direct questioning when the respondent bears the sensitive trait, λ_1^L, which represents the probability of an untruthful response under direct questioning when the respondent bears the sensitive trait, and λ_0^T, which represents the probability of a truthful response (as opposed to non-response) when the respondent does not bear the sensitive trait. In examining who lies about corruption under direct questioning, we will be examining the values of these diagnostic parameters.

To explore how individual characteristics shape untruthful reporting about corruption, we analyze original survey data from Costa Rica. The survey (administered in 2013–2014) consisted of face-to-face interviews with 4,200 residents 18 years or older

in the Gran Área Metropolitana—the country's principal urban center (2.6 million residents; 60% of the country's population).[6]

Results

We begin our analysis by confirming that respondents, in general, do lie about corruption. Supplementary Table A2 presents the prevalence estimates from direct questioning, SST questioning only, and the parameter estimates provided by the joint response for the entire sample for both corruption questions (Q1 and Q2). In line with previous findings, we find that people respond differently when asked about corruption under a format that provides anonymity. The estimates of the willingness to bribe based on direct responses are indeed below those based on the joint response model and crosswise responses only. As expected, given social desirability concerns, the frequency of the willingness to bribe is uniformly greater than admissions of past bribery across all questioning formats. Moreover, using the joint response model, we find that truthfulness under direct questioning is estimated to be higher when respondents are queried about their hypothetical willingness to bribe (Q1; $\widehat{\lambda}_1^T = 0.61$) than it is when respondents are asked about whether they actually paid bribes in the past (Q2; $\widehat{\lambda}_1^T = 0.54$).[7]

We now move on to focus on how personal characteristics affect a respondent's willingness to provide (or not) a truthful response when asked directly. Figures 2–5 present the prevalence estimates from direct questioning, SST questioning only, and the parameter estimates provided by the joint response model for gender (female, male), age (less than 28, 29–42, 43 and older), education (some university education, complete secondary education, incomplete secondary education or less), and wealth (low, middle, high).[8] We focus here on the question about the willingness to bribe (Q1). Results for Q2 are similar and can be found on Supplementary Appendix B.

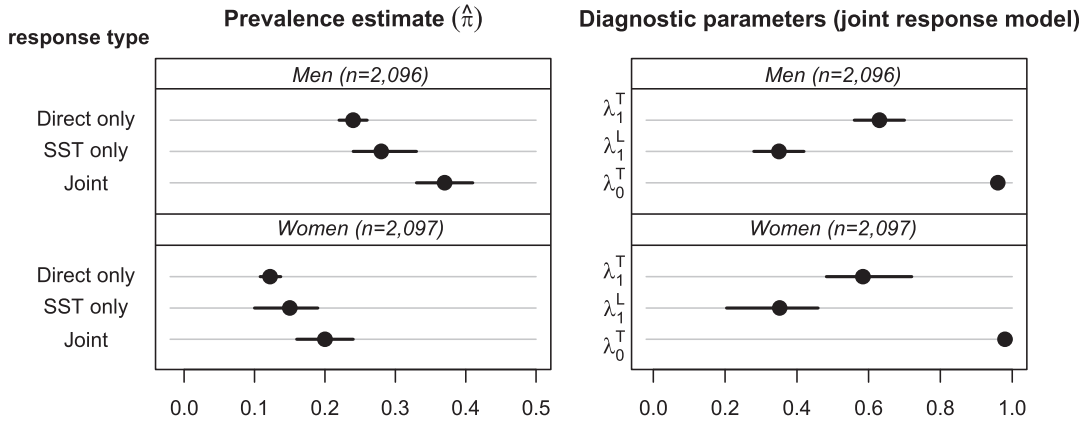
Figure 2 shows that men and women respond quite differently when asked under the SST. In both cases, the estimates of the willingness to bribe based on direct questioning are below those based on the crosswise model and the joint response model. Men are also significantly more likely to express a willingness to bribe across all response types. However, women are no more likely to lie about engaging in corruption than men. The diagnostic parameters are quite similar for men and women. The value of the parameter that captures the probability of a truthful

[6]See Supplementary Appendix A for details on the survey.

[7]Also as expected, respondents' hypothetical willingness to bribe is strongly associated with declarations of past bribery. Among those who stated under direct questioning that they bribed in the last 12 months, 71% stated they would be willing to pay a bribe; among those who stated they had not bribed in the last 12 months, only 13% stated they would be willing to pay a bribe. Similarly, among those who stated they were willing to bribe, 35% indicated that they had paid a bribe in the last 12 months; among those who stated they were unwilling to pay a bribe, only 3% indicated that they had paid a bribe in the last 12 months.

[8]To measure wealth, a two-factor item response theory (IRT) model was estimated using ownership of a cellphone, laptop, tablet, car, widescreen television, cable television, and internet access. Factor scores were calculated for each respondent according to the empirical Bayes method. A three-value, ordinal indicator of wealth was then created based on the terciles of the factor scores. Consequently, our measure of wealth captures *relative* wealth in ownership of consumer goods. Estimation of the IRT model and factor scores utilized the R package ltm (Rizopoulos, 2006).

Figure 2
Willingness to bribe, by gender



response under direct questioning by those who are actually willing to bribe, $\widehat{\lambda}_1^T$, is 0.63 [0.56, 0.71] for men 0.58 [0.48, 0.72] for women.[9] We find similar results when asked about having paid a bribe in the past (Q2) (Supplementary Table A3).

Figure 3 shows that, across the different estimation strategies, older respondents are less likely to express a willingness to bribe (joint response estimates: 0.39 [0.33, 0.44] for those less than 28 years old, 0.31 [0.26, 0.36] for those between 28 and 43 years old, and 0.18 [0.13, 0.23] for those 43 and older). We find, however, no support for H2. The diagnostic parameters are indeed quite similar across the three age groups. The value of the parameter that captures the probability of a truthful response under direct questioning by those who are actually willing to bribe ($\widehat{\lambda}_1^T$) is 0.65 [0.58, 0.74] for those less than 28 years old, 0.60 [0.52, 0.71] for those between 28 and 43 years old, and 0.55 [0.42, 0.76] for those 43 and older. Older respondents are not more likely to lie about their willingness to pay a bribe than younger respondents, nor are they more likely to lie about having paid a bribe in the past (Q2) (Supplementary Table A4).

Figure 4 reveals a slight difference in the willingness to bribe across education groups. According to the joint response estimates, the prevalence of such willingness was 0.22 among those with some university education versus 0.30 among those who only completed secondary school and/or some technical training, and 0.30 among those with an incomplete secondary school education or less. The value of the parameter that captures the probability of a truthful response under direct questioning by those who are actually willing to bribe, $\widehat{\lambda}_1^T$, is 0.67 [0.51, 0.92] for those with some college education, 0.67 [0.57, 0.81] for those who completed secondary or technical training, and 0.57 [0.50, 0.65] among those with an incomplete secondary school education or less (note, however, that the confidence intervals exhibit substantial overlap). We find slightly stronger differences across groups (in the same direction) when using the alternative question (Q2) (Supplementary Table A5).

[9]Ninety-five percent confidence intervals in brackets.

Figure 3
Willingness to bribe, by age

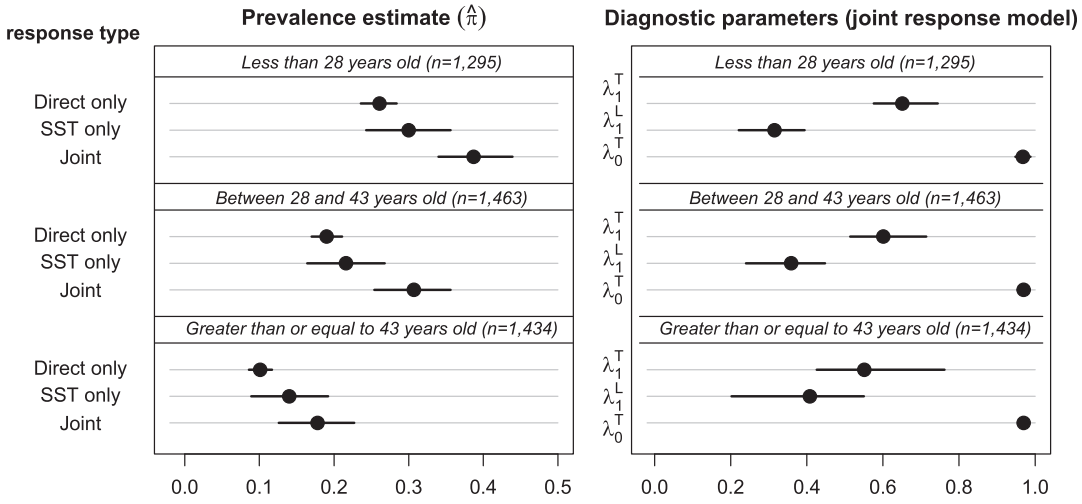
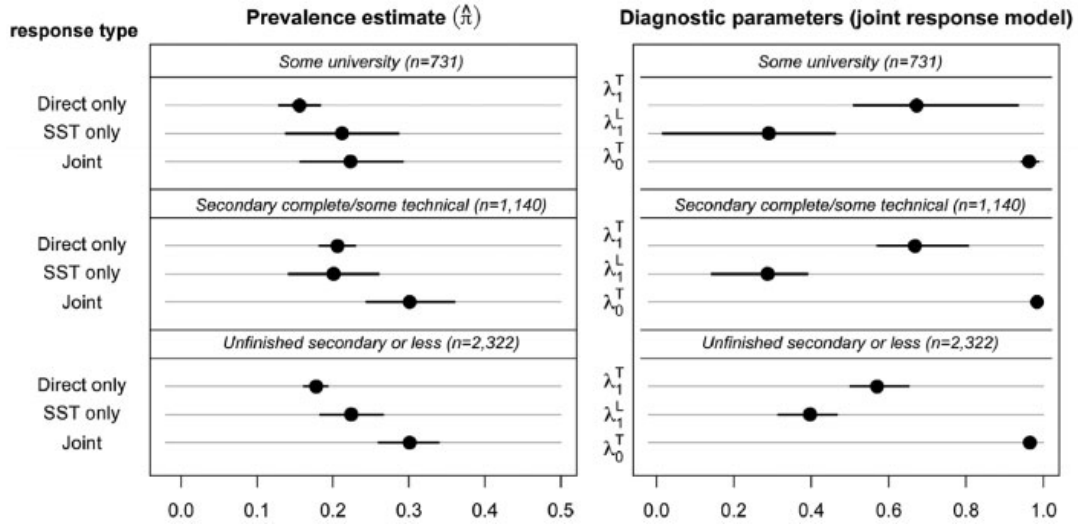
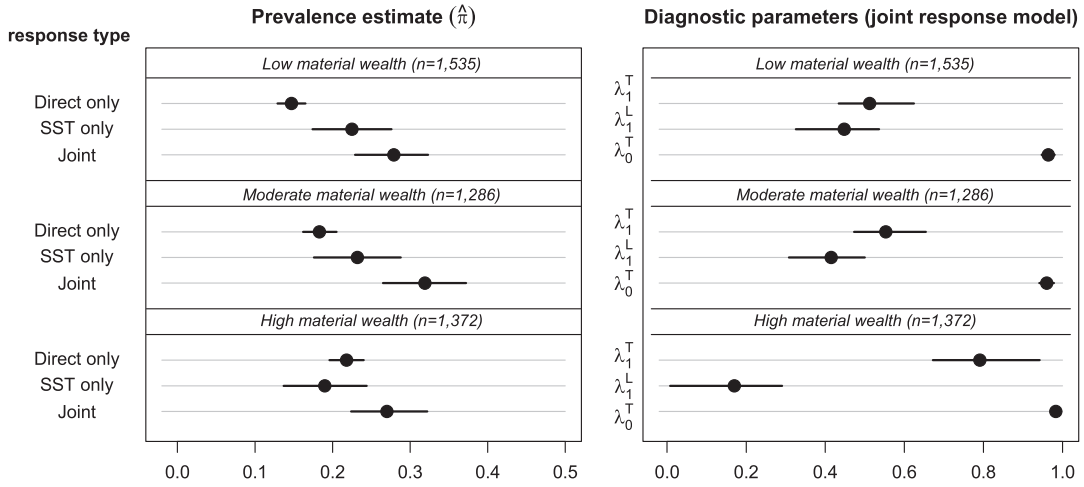


Figure 4
Willingness to bribe, by education



We find no clear relationship between the willingness to bribe a police officer and wealth. Richer (poorer) respondents are not more (less) likely to express a willingness to engage in corrupt behavior. However, we do find a strong negative relationship between wealth and evasiveness in responses. When asked directly, richer respondents are more inclined to respond truthfully about the willingness to bribe. The value of the parameter that captures the probability of a truthful response under direct questioning is significantly higher for the richer group of respondents ($\widehat{\lambda}_1^T$ =0.80 [0.67,

Figure 5
Willingness to bribe, by wealth



0.94]) than it is for the middle group ($\widehat{\lambda}_1^T$=0.55 [0.47, 0.66]) and the poorest group ($\widehat{\lambda}_1^T$=0.51 [0.43, 0.61]). The poorest respondents bearing the sensitive trait were roughly equally likely to tell the truth and lie under direct questioning ($\widehat{\lambda}_1^T$=0.51, $\widehat{\lambda}_1^L$=0.45), while the richest respondents were significantly more likely to tell the truth when asked directly ($\widehat{\lambda}_1^T$=0.80, $\widehat{\lambda}_1^L$=0.17). We find similar results with Q2 (Supplementary Table A6).[10]

Discussion

Applying a joint response framework to original survey data from Costa Rica, we find that wealth and, to a lesser extent, education, are relevant predictors of the propensity to lie about corruption, but gender and age are not. The findings cast a new light on existing results in the corruption literature. Women's well-documented aversion to corruption recorded in direct response surveys likely reflects real differences in behavioral and attitudinal tendencies across genders. In contrast, our findings linking low education and wealth to evasiveness in responses about corruption offer two potential amendments to existing research. First, the recorded negative effects of education on corruption may be systematically *underestimated* due to the fact that lesser educated respondents are more inclined to lie about this topic. Second, the mixed findings on wealth and corruption in existing work may be due, at least partly, to differences across income groups in the willingness to respond honestly to questions about corruption.

[10]Given that education and wealth are characteristics that tend to be correlated with one another, we analyzed the influence of these variables in a 2 × 2 design. Supplementary Table A7 presents the full results. The findings indicate that wealth is a more powerful determinant of truthfulness under direct questioning about corruption than formal education.

One explanation for why an inclination to lie about corruption may be tied to wealth and education is concern about social status. It is widely appreciated that petty corruption in Latin America and elsewhere is largely targeted at the poor and other vulnerable populations (cf. Fried et al., 2010). Consequently, for individuals who are less wealthy or educated, admitting that one is involved or inclined to engage in corruption may seem like an admission of lower social status. For an individual whose material possessions and education clearly demonstrate a high status, a similar admission would not matter as much, as there would be little doubt about their placement in the social hierarchy.

There are many avenues for future research. One potentially worthwhile strategy would be to estimate patterns of lying within the context of a statistical model of joint direct and protected responses that allows for the possibility of non-strategic response error. Work on this topic is in its infancy and focuses solely on the list experiment technique (Blair, Chou, & Imai, 2019). Another important step would be to reproduce this analysis in different cultural contexts, since the intensity of shame associated with responding directly about corruption is likely to vary across countries (cf. Simpser, 2017). Finally, the technique used in this paper could be applied as well to study how individual characteristics shape untruthful reporting in surveys about other sensitive behaviors. Whether our findings about the individual correlates of the propensity to lie about corruption will be similar with other sensitive behaviors remains to be seen.

Supplementary Data

Supplementary Data are available at *IJPOR* online.

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Biographical Notes

Virginia Oliveros is Assistant Professor of Political Science and Associate Research Fellow at the Center for Inter-American Policy and Research and the Roger Thayer Stone Center for Latin American Studies at Tulane University.

Daniel W. Gingerich is Associate Professor of Politics, Director of the Quantitative Collaborative, and Co-Director of UVa-CLEAR (Corruption Lab for Ethics, Accountability, and the Rule of Law) at the University of Virginia.