

Martinangeli, Andrea; Windsteiger, Lisa

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Cheating Responses to Tax Evasion

Andrea F.M. Martinangeli* Lisa Windsteiger†

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Abstract

This paper uses a survey experiment on a representative sample of the Italian population to explore whether respondents' propensity to cheat is conditional on information about tax malpractice. Our study thus generalises previous laboratory findings on conditional behaviours (cooperation, cheating) to uncover their real-world bearing in the context of tax compliance. We find asymmetries along the income gradient: The strongest conditional responses are uncovered in connection to tax malpractice on behalf of the rich, which induce a greater propensity to cheat.

JEL classification Codes: D01, D31, D63, H23, H26

Keywords: Tax evasion, tax avoidance, conditional cooperation, cheating, survey experiment

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*CEREN EA 7477, Burgundy School of Business, Université Bourgogne Franche Comté, Dijon, France; andrea.martinangeli@bsb-education.com

†Max Planck Institute for Tax Law and Public Finance. lisa.windsteiger@tax.mpg.de

1 Introduction

Conditional cooperation has been robustly observed across different societies: individuals cooperate with others (at risk of exploitation) insofar and inasmuch others cooperate in turn (Fischbacher et al., 2001). Such simple yet powerful intuition pertains to a wide range of economic activities, from household management to the funding of publicly provided goods. Frey and Torgler (2007) find in conditional cooperation a relevant force driving tax compliance: Tax morale is reduced by the perceived pervasiveness of tax evasion in one’s own country, perhaps triggering vicious cycles reminiscent of the cooperation collapse observed in laboratory public good games.

This paper aims at further investigating the power of tax compliance (conversely, tax malpractice) in inducing conditional behavioural responses. Specifically, we aim at observing conditional behaviours typically measured in controlled laboratory environments within a broader paradigm, at generalising those findings to the general population, and at uncovering the real-world bearing and consequences of (potentially asymmetric) conditional behavioural responses in the domain of tax compliance.

The salience of tax malpractice has in fact risen sharply in the past decade following the data leaks about tax evasion and avoidance via international tax shelters (Gar-side, 2016). The so far accumulated evidence about conditional cooperation (e.g. Fischbacher et al., 2001; Frey and Meier, 2004; Frey and Torgler, 2007; Kocher et al., 2008; Martinsson et al., 2013; Rockenbach et al., 2021; Martinangeli, 2021) suggests that such an intensified news, social and political focus on antisocial behaviours might erode individuals’ beliefs (both normative and empirical) about the degree to which other in society are willing to cooperate, thus exacerbating the unravelling of cooperation and increasing the incidence of antisocial practices. It is hence imperative to uncover the fall-out of such practices, and to gain an insight into the breadth of their consequences on the social fabric: its behaviours, its perceptions and on the propagation of unethical, antisocial and uncooperative practices.

Causal inference on conditional behavioural responses to tax compliance in natural settings is however impaired by the lack of credible exogenous variation in the conditioning variable. While suggestive of the conditional nature of tax compliance on perceived incidence of tax malpractice in society, the results presented for instance by Frey and Torgler (2007) cannot be taken as identifying a causal link. It is in fact impossible to exclude the presence of inverse causality or of spurious correlation between the two phenomena. In this study we therefore adopt a large-scale experimental design allowing us to observe direct responses to exogenously induced

variation in (information about) estimated tax compliance. We are thus capable of uncovering the causal effect of tax malpractice on our respondents' behaviour.

Further, because unethical practices in tax compliance are most profitable and common among the highest income earners (Alstadsæter et al., 2019), news reporting on the topic has naturally mainly been centred on the upper end of the income distribution. As a result tax malpractice on behalf of the upper echelons of our societies has received greater resonance and political and popular interest than tax dishonesty on behalf of lower portions of the income distribution. Such impartial focus might well be consequential for the behavioural responses to tax malpractice throughout society, particularly on the propagation of (un)ethical behaviours.

It remains unclear, from previous investigations on conditional behaviours (in particular from the large corpus of research in experimental economics; for instance Fischbacher et al. (2001) and citing literature), whether behaviours would be conditioned on those of others differently depending on their income. A long-standing literature in evolutionary psychology and biology, however, has established that (the presence of) high status individuals is capable of, for instance, altering the cognitive mechanisms of onlookers, making them capable of better attracting their attention and of influencing their actions (e.g. Henrich and Gil-White, 2001; Zitek and Tiedens, 2012; Koski et al., 2015). In economics, recent evidence has emerged showing that "richer" individuals receive a different kind of attention, trigger stronger conditional responses in others' prosociality (Martinangeli, 2021; Rockenbach et al., 2021), and are, broadly speaking, more capable of influencing their personal choices (Martinangeli and Meiske, 2021). Building on these findings, we hypothesize that asymmetries in conditional cooperation might translate into asymmetric responses to (information about) tax evasion at the top and at the bottom of the income distribution.

Tax malpractice is a sensitive topic. Truthful reporting of behaviours in this domain is hard to obtain and ridden with systematic confounds and biases posing serious threats to the validity of the results obtained. Further complicating the matter, behaviours in the tax compliance domain can be hardly incentivised within the framework of a research design. For this reason, we resort to studying the propensity to cheat towards the experimenter (e.g. Fischbacher and Föllmi-Heusi (2013); Kocher et al. (2017)). Cheating behaviours are widely studied not only because of their intrinsic interest, but also because of their distributional and economic consequences on real world outcomes and their implications for real world economic phenomena, including tax malpractice. We hence adopt the cheating paradigm to shed light on the behavioural consequences of tax dishonesty and to offer a first approach at the generalisation of the findings of the large and growing cheating literature and their application to the real world scenarios they address.

Exposure to information about the incidence and extent of tax malpractice might shift individuals' perceptions about the social norms surrounding it, depending on the direction with which their own beliefs about its incidence and extent are shifted by the information. We elicit our participants' perceptions of the tax compliance norm using a variant of the Krupka and Weber method (Krupka and Weber, 2013). Specifically, we ask the participants to make an incentivised guess of the modal appropriateness rating to the practice of tax evasion observed in the 5th wave World Value Survey in Italy (Inglehart et al., 2014). As the modal rating given is the lowest possible out of 10, we can interpret any tendency to guess higher values as unequivocal evidence of perceptions of a weaker tax compliance norm.

Finally to broaden our insight into the societal consequences of the information we provide, we elicit the participants' subjective level of generalised social trust. Again, exposure to information about the incidence and extent of antisocial behaviours might affect individuals' willingness to trust others in society, perhaps differently according to the specific social group most severely engaging in unethical practices. In summary, we gather large-scale experimental evidence from a representative sample of the Italian population offering an insight into whether systematic asymmetric (conditional) shifts in behaviours and in norms of behaviour can be observed in response to variation in information about tax evasion at the top and at the bottom of the income distribution.

We find that indeed cheating rates increase whenever tax malpractice is presented as more severe among high income than low income individuals. Instrumenting the change in participants' beliefs with the experimental conditions, we find that larger upwards updates are associated with a greater propensity to cheat. Moreover, we observe that individuals correctly shift their perception of the tax compliance norm, in that it is perceived as weaker whenever low income earners, the largest among the two groups, are presented as engaging in more severe tax malpractice. This result is confirmed in an instrumental variable analysis of beliefs. Finally, we observe that social trust declines significantly at overall higher levels of tax malpractice, without asymmetries with respect to income. This finding is once again confirmed to be mediated at least in part by shifts in the participants' beliefs.

Section 2 illustrates the experimental strategy, the sample and the implementation, Section 3 describes our hypotheses and the empirical analysis, Section 4 presents the results while Section 5 discusses and concludes.

2 Experimental strategy

The experimental component of our research design consists of the random provision of information about the estimated incidence of tax malpractice in Italy to subgroups of a representative Italian online survey panel. We systematically vary whether respondents receive high vs. low estimates of tax malpractice in lower vs. higher portions of the income distribution.

To construct our information intervention, we first collected data from a survey of economists based in Italian research departments (our “experts survey” henceforth). We were able to contact via email 470 out of the top 500 leading economists according to the RePEc ranking list on the 11th of November 2019.¹ We provided them with a link to an anonymous Qualtrics survey we had designed specifically for this purpose, in which we asked them for their personal estimate of the share of total income that remains undeclared by each of the income quintiles of the Italian income distribution, and by the top 10% and 1% income earners.² We then classified the responses obtained according to whether they provide relatively high or low estimates of the share of undeclared income for the bottom quintile and the top 10% of income earners. The range of variation in estimated undeclared income is then used to construct the information conditions we provided to the respondents of the main survey. Specifically, to construct a *high* (respectively, *low*) estimate of undeclared total income for a given income quantile we take the mean of the estimate provided by the group of experts estimating a share of undeclared total income *above* (*below*) 50% for that same quantile. This strategy allows us to truthfully inform the respondents that “some of” the surveyed economists estimate that the “bottom” and “top” income earners do not declare the computed average shares of their total income. Crucially, as we provide our respondents with information about estimated undeclared total income for both top and bottom income earners, we ensure that both estimates originate from the same group of experts. As will be clear from what follows, our information conditions cover all configurations of high and low estimates for top and bottom income earners.³

The average estimated shares differ across the subgroups of experts. As can be seen from Table 1, however, all high estimates are clustered between 61 and 66%. Similarly, all the low estimates are clustered between 23 and 28%. Therefore, in order

¹<https://ideas.repec.org/top/top.italy.html#authors>

²The response rate was approximately 22% after running our experts survey for three days (i.e. on the 14th of November 2019), totalling 105 responses over 470 contacted economists. We used these responses to construct our information conditions.

³We carefully specify in the survey that the information provided originates from a subset of a number of interviewed experts.

to provide all respondents with identical information about high and low estimates, we inform them that the estimated share of undeclared total income is “more than half (around 65%)” or “less than half (around 25%)”.

2.1 Sample, sample size and power

We ex-ante aimed at collecting responses from 800 individuals per information condition, totalling 4000 respondents, from a representative sample of the Italian population (representative with respect to gender, age and income). The panel, the distribution of the survey and the payments were administered by the survey company Respondi.⁴ As further detailed in our pre-registered analysis plan, we restrict our investigation to respondents who had an opportunity to cheat on their reporting task (i.e., their random draw would yield no additional payoff to them unless they falsely report a winning outcome). As the winning outcome occurs with a probability $p=1/6$ we obtain an expected sample size per condition of $5/6*800=666$ respondents with an opportunity to cheat.

Ex-ante power computations (referring to pairwise comparisons of cheating rates across information conditions) yield a minimum detectable upward effect size in cheating behaviour (proportion of winning outcomes reported) of $\delta=0.07$ over an assumed baseline proportion $b=0.5$ at power $\pi=0.8$.⁵

We collected 4539 complete responses.⁶

2.2 Information conditions

We randomly assign the respondents to one of 5 information conditions in a $2 \times 2 + 1$ design. To provide a clear baseline, we include a “neutral condition” in which respondents read a neutral sentence only generically referring to tax malpractice.⁷ The other conditions vary whether respondents are informed about:

⁴<https://www.respondi.com/EN/>

⁵Notice that the above assumed baseline proportion allows us to be as conservative as possible in our power computation, as it is the one associated with the largest variance. Fixing the effect size, the resulting power increases for more extreme values of the baseline proportion (or equivalently, the minimum detectable effect decreases for power fixed at $\pi=0.8$).

⁶Our results are robust to the exclusion of the fastest and slowest 5% responses.

⁷We purposefully avoid using the terms “evasion” or “avoidance”, as we do not wish to restrict our investigation to either of the two, nor do we wish to force our respondents to take a stand on the legal or moral dimension of the two practices. Our wording allows instead respondents to freely interpret our information in either way and without any consequence on our research objectives.

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- a *low* estimated share of undeclared income among both the *top* (10^{th} decile) and *bottom* (1^{st} quintile) income earners (Condition *LL*),
 - a *high* share in *top* and *bottom* income earners (Condition *HH*),
 - a *high* and a *low* share in respectively *top* and *bottom* income earners (Condition *HL*),
 - a *low* and a *high* share in respectively *top* and *bottom* income earners (Condition *LH*)

The data used to generate the information conditions is presented in Table 1 below.

Subgroup of surveyed experts	Quantile of the income distribution	Estimated share of undecl. total income	Associated condition	
Subgroup 1:	Top 10%:	> 50%	61.14	Condition HH
	First quintile:	> 50%	62	
Subgroup 2	Top 10%:	> 50%	62.19	Condition HL
	First quintile:	< 50%	25.14	
Subgroup 3	Top 10%:	< 50%	27.28	Condition LH
	First quintile:	> 50%	66	
Subgroup 4	Top 10%:	< 50%	25.63	Condition LL
	First quintile:	< 50%	23.24	

Table 1: Shares of total income undeclared by the first quintile and top decile of income earners in Italy estimated by the surveyed experts.

The experimental information is conveyed to the respondents by means of video clips which they visualise in the course of the survey. Stills of the clips are provided in Figures C2 to C6.

Each of the videos begins with a statement concerning how tax malpractice is a topic recurrently discussed in the media. Only the video for the Neutral condition then continues immediately with an invitation for the respondent to proceed with the survey. All the other videos inform our respondents of the estimated incidence of tax malpractice among top and bottom income earners as described above.

In all information conditions the order in which information about top and bottom income earnings is presented is randomised to control for order effects. Moreover, immediately after having viewed the video clips, respondents are asked to restate the information just received, and must do so in order to proceed with the questionnaire.

They are in this case given the opportunity to re-play the video. This way, we both ensure that any inattentive respondents will be pushed to go back to the videos, and we obtain information to be used as a manipulation check.

Condition Neutral The information provided in the Neutral condition only generically refers to tax malpractice without making reference to its estimated incidence in the population (see Appendix C for screenshots of the experimental conditions).

Condition HH Figure C3 in Appendix C displays the information given to the respondents assigned to Condition HH. This group of respondents receive information that among top and bottom income earners “more than half (around 65%) of total income remains undeclared”. We randomised the order of presentation to control for order effects.

Condition HL Figure C4 displays the information given to the respondents assigned to Condition HL. This group of respondents receive information about the fact that among top income earners “more than half (around 65%) of total income remains undeclared”, and that among bottom income earners “less than half (around 25%) of total income remains undeclared”. We randomised the order of presentation to control for order effects.

Condition LH Figure C5 displays the information given to the respondents assigned to Condition LH. This group of respondents receive information about the fact that among top income earners “less than half (around 25%) of total income remains undeclared”, and that among bottom income earners “more than half (around 65%) of total income remains undeclared”. We randomised the order of presentation to control for order effects.

Condition LL Figure C6 displays the information given to the respondents assigned to Condition LL. This group of respondents receive information that among top and bottom income earners “less than half (around 25%) of total income remains undeclared”. We randomised the order of presentation to control for order effects.

3 Empirical strategy

3.1 Variables

3.1.1 Outcome variables

Our primary outcome of interest is the relationship between cheating behaviours and our information conditions. Following a large body of recent literature, our behavioural outcome variable measures cheating behaviours towards the experimenter (e.g. Fischbacher and Föllmi-Heusi (2013), Kocher et al. (2017)): After receiving one of the above described information treatments, the respondents have to report the outcome of a “lottery” visualised on screen. The video displays the outcome of a six-faced fair die roll. Respondents are asked to report the visualised outcome and are informed that in case the reported outcome of the die roll is the number “6”, they will receive an additional payment of 25 (one-third of the baseline participation payment), while any other reported outcome will result in no additional payment. As the additional payment is conditional on the self-reported outcome of the die roll, respondents have a clear incentive to misreport the outcome. The distribution of reported outcomes can be ex-post contrasted with the implemented distribution of outcomes displayed (i.e. that of a roll of a fair die) such that the incidence of cheating can be measured and compared across conditions. Moreover, as we know which outcome was displayed on video, we can detect cheating at the individual level.⁸ We can thus construct an indicator taking value 1 if the respondent has cheated and zero otherwise, given that an opportunity to cheat existed (i.e. the displayed outcome of the die roll was not 6). The following text is displayed to the respondents (translated from Italian):

“The video displayed just above was randomly selected by the software among six videos displaying the six possible outcomes of the roll of a six faced die. The outcome that you can see is therefore obtained as if a die had been actually rolled. You can watch the video again if you wish.

Your task is to tell us the result of the die roll.

You will earn 25 additional points if you tell us that the outcome is 6. You will not earn additional points if you tell us that the outcome is not 6.

What is the outcome of the die roll?

⁸At the beginning of the survey we emphasize that we collect only anonymous data.

Further, we elicit norm shifts along the lines of Krupka and Weber (2013) by asking respondents to guess (against additional payments) the modal rate of agreement/disagreement to questions on the appropriateness of questionable behaviours (tax evasion, claim of underserved benefits, free riding on public transport and bribery) elicited in the World Values Survey for Italy, wave 2005. For exact guesses, the respondents receive an extra monetary incentive equal to 15 points (one-fifth of the fixed participation payment).

Finally, we elicit the respondents' unincentivised opinion of commonly debated topics of general interest: whether wealth can be accumulated only at others' expense, the value of hard work for life success, the importance of redistribution, generalized trust, the likelihood of being exploited by others and the appropriateness of current personal and general tax burden in Italy.

3.1.2 Covariates

We elicit the respondents' standard socio-economic background: their region of residence, education, household income, household size, employment status, age and gender. We moreover elicit, but do not use in our analyses, the respondents' ethnic background, their political orientation and media consumption.

We further elicit the respondents' prior and posterior beliefs about the incidence of income tax malpractice among the top and bottom income earners in Italy. These two beliefs together will allow us to gain an insight both into the effectiveness of our experimental conditions on each respondent, and into one of the channels by which the information provided might work, i.e. belief updating (Martinangeli and Windsteiger, 2019; Haaland et al., 2020).

Notice that we could not include an attention checker to screen inattentive survey responders out. We thus exploit our prior-posterior beliefs elicitation to distinguish those respondents who have paid attention to the information provided (the "treated") and updated their beliefs accordingly from those who did not (the "untreated"). We will perform separate analyses of our experimental conditions on these two groups.

3.2 Hypotheses

Our primary focus is the relationship between the information conditions provided and the rates of cheating in the reporting task. Hence, we formulate hypotheses related to this outcome variable (cheating rate) and investigate the secondary outcome variables in support and generalization of our main findings.

The overarching hypothesis is that exposure to higher estimated tax evasion rates will cause an increase in the cheating rate in the reporting task compared to exposure to lower tax evasion estimates.

Hypothesis 1. *Cheating increases with the reported tax evasion estimates.*

Furthermore, our design allows us to capture asymmetries in the impact of estimated tax evasion rates according to the income bracket for which these rates are reported. Specifically, we hypothesise that the effect on cheating rates will differ according to whether estimated evasion rates increase in high compared to low income brackets. Two alternative predictions can be formulated. First, cheating rates might be higher if high tax evasion rates are reported for high income brackets compared to low income brackets. This hypothesis rests on the fact that higher income brackets have a greater capacity to contribute to public welfare and public good provision, with a lower relative impact on private consumption. This hypothesis is aligned with the findings in Martinangeli (2021). Second, and conversely, cheating rates might be higher if high tax evasion rates are reported for low income brackets compared to high income brackets. Low income brackets, relying more heavily on public support and social welfare systems, might be expected to pay their fair contribution to their financing. This leads to the formulation of two alternative hypotheses.

Hypothesis 2 (Asymmetries).

- a. *Cheating rates are higher when high estimated tax evasion occurs in high income brackets compared to low income brackets.*
- b. *Cheating rates are higher when high estimated tax evasion occurs in low income brackets compared to high income brackets.*

3.3 Specifications and analysis

3.3.1 Hypotheses 1 and 2

Hypotheses 1 and 2 will be tested as follows. Our dependent variable is an indicator taking value 1 if a respondent cheated and zero otherwise, given that a cheating opportunity existed. Denote the event of a winning random draw as $D=1$ and the complementary outcome of a losing random draw as $D=0$. We model the probability that respondent i will cheat as a function of the information condition they received and of a number of controls listed in Section 3.1.2 conditional on $D_i=0$:

$$Pr(L_i = 1 | C_{iNN}, C_{iLL}, C_{iLH}, C_{iHL}, C_{iHH}, X_i, D_i = 0) = \Phi(\alpha + \alpha_{LL}C_{iLL} + \alpha_{LH}C_{iLH} + \alpha_{HL}C_{iHL} + \alpha_{HH}C_{iHH} + \beta'X_i + \varepsilon_i) \quad (1)$$

where L_i is an indicator variable equal to 1 if respondent i has cheated given that the random draw resulted in no additional payoff (scope for cheating exists). The indicators $C_{i.}$ represent our conditions, with the Neutral condition C_{iNN} serving as excluded category, and where C_{iLL} takes value 1 if respondent i was in Condition LL and similarly for the other conditions. X_i represents a vector of individual and regional covariates. We fit the model using the cumulative distribution function Φ of the standard normal distribution.

We can then test for our Hypotheses as follows:

Hypothesis 1

$$H0 : \alpha_{LL} < \alpha_{HH}$$

$$H1 : \alpha_{LL} \geq \alpha_{HH}$$

Hypothesis 2a

$$H0 : \alpha_{LH} > \alpha_{HL}$$

$$H1 : \alpha_{LH} \leq \alpha_{HL}$$

Hypothesis 2b

$$H0 : \alpha_{LH} < \alpha_{HL}$$

$$H1 : \alpha_{LH} \geq \alpha_{HL}$$

Notice that an equivalent way of performing these tests is that of excluding the neutral condition subsample and writing Equation (1) relative to, say, C_{iLL} which would serve as the excluded category, and accordingly rewriting the hypotheses. This is possible because our hypotheses do not involve comparisons of any of our information conditions with the neutral one. We will perform such analysis as a robustness check of our results.

4 Results

Figure 1 displays the distribution of prior and posterior beliefs about the proportion of income that remains undeclared by high and low income individuals, respectively. Two things are worth pointing out in these graphs. First, our respondents do not have very clear or accurate prior beliefs about the proportion of income hidden by the two groups. Both bottom and top income earners are expected to hide the most disparate proportions of their incomes. For both groups, beliefs about the percentage of income that remains undeclared range from 0% to 100%, averaging 44% for bottom and 54% for top income earners (two-sided T-test p-value<0.001). These observations suggest that information about specific numbers (proportions of

hidden income) might have little meaning per se for our respondents, unless reference points allow the observer to interpret them (as “high” or “low”) or to rank top and bottom income earners according to the severity of their tax malpractice.⁹ Second, while prior beliefs are fairly spread out over the entire support, posterior beliefs are strongly concentrated around the values provided in our experimental conditions (the neutral condition is excluded from this graph since they did not receive information to update their beliefs), suggesting that our experimental strategy obtained the desired effect.

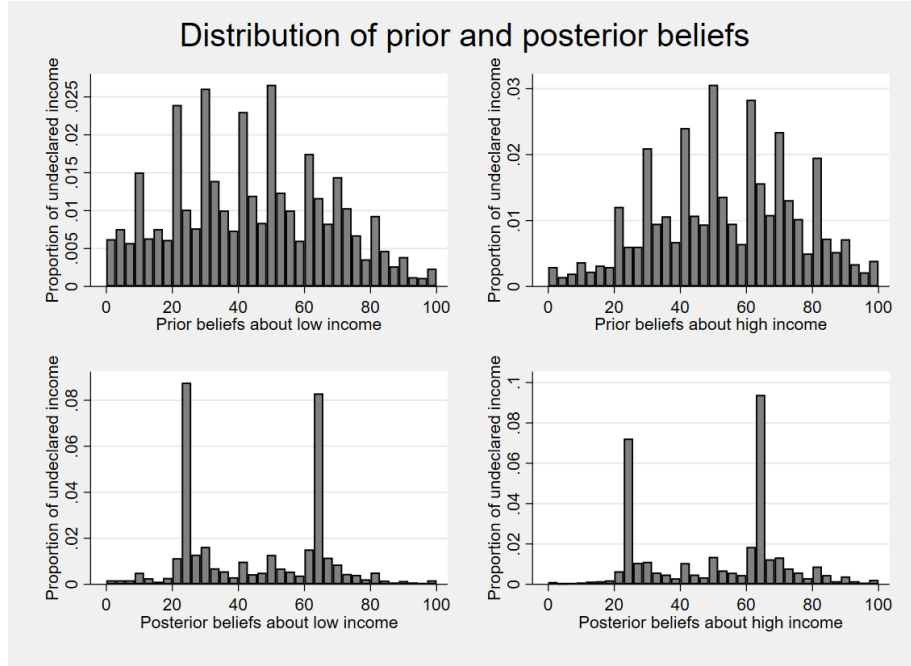


Figure 1: Distribution of prior beliefs about income undeclared by high and low income individuals.

Nonetheless, the graphs suggest that some of our respondents did not (fully) update their beliefs, or potentially updated in an unexpected way. In order to identify the impact of our experimental conditions, we will conservatively consider as *treated sample* only those respondents who show signs of even minimal updating in the

⁹It is interesting to see that the vast majority of the respondents (60.3%) reported prior beliefs assigning greater proportions of hidden income to the top income earners than to the bottom income earners. Conversely, 33.2% stated prior beliefs assigning greater proportions of hidden income to bottom earners, and only a small minority (6.4%) stated equal beliefs about the two groups. Figure A1 in Appendix A.

“right” direction (i.e. upwards if their prior is lower than the information provided, and vice versa). Conversely, we will consider as *untreated* all those individuals who did not update, or updated in the direction opposite to that expected. Our analyses will hence split the sample along the treated/untreated dimension, looking primarily for systematic differences in cheating responses among the treated and among the untreated to serve as a comparison and robustness check.

We investigate the determinants of cheating propensity given the opportunity to cheat, i.e. having observed a die roll different from 6. For this reason, we restrict our regressions to the subsample of individuals who did not visualise a roll of 6 in the video. The regression controls include age, gender, education level (= 1 if respondents have completed high school), equivalent household income, worker (= 1 if in the labour force) and region fixed effects, and standard errors are clustered at region level.

Tables 2 and 3 display the results of OLS regressions investigating the pairwise comparison of cheating rates across experimental conditions. We resort to separate regressions with pairwise comparisons of the conditions to ease the reading of the tables and of the coefficients.¹⁰ Following our convention, the comparisons are labelled as XX_YY, where X and Y can both take values H and L identifying our experimental condition, and where XX is the condition taken as baseline in the pairwise comparison. Exemplifying, the last column of Table 2 compares cheating in our HL condition (high proportion of unreported income by high income individuals, low proportion of unreported income by low income individuals) with cheating in our LL condition (low proportion of unreported income by both high and low income individuals).

Our aim is to show that respondents cheat more in HL (where rich hide more income than poor in relative terms) compared to any other situation: i.e. when the top and bottom income earners are estimated to hide roughly equal proportions of their incomes, or when the rich top earners estimated to evade smaller proportions than the bottom earners. We are in this sense broadening our analysis compared to what we declared in our pre-analysis plan. There, we only report the hypotheses and tests in Sections 3.2 and 3.3. It appears clear however from looking at the results and at the information display in Appendix C that our HH and LL conditions failed to deliver the intended meaning: it is hard for a non-specialist respondent to interpret the numbers alone without any reference point. It is hence unclear to the viewer whether a 65% proportion of undeclared income is a high or a low proportion without having a different number to contextualise it, as it happens when top and bottom

¹⁰Table B1 in Appendix B.1 shows that all pairwise results hold in a regression including all our condition indicators.

income earners are estimated not to declare the same income proportion. Different is the situation when the two are estimated to hide different proportions of their income: In this case, it is clear which one is the group hiding the greater or the smaller share of income.

Table 2 shows that under the HL condition, our respondents indeed displayed a greater propensity to cheat than in any other condition. In other words α_{HL} is positive and significant among the treated. Importantly, the same is *not* true in the LH condition. Subjects in this condition received information that *low* and *high* income individuals are estimated to hide respectively relatively high (around 65%) and low (around 25%) proportions of their income. The absence of an effect here is crucial: Even though the respondents could, based on the information they received, unequivocally rank the two groups on the estimated incidence of tax malpractice (see the discussion above about the presence of a clear numerical context), the participants do not condition their behaviours on the information they received. Put differently, individuals seem to be more prone to cheating when the “tax scoundrels” have a high income than when they have a low income.

	(1)	(2)	(3)	(4)	(5)	(6)
	HH_HL		LH_HL		LL_HL	
VARIABLES	Cheated	Cheated	Cheated	Cheated	Cheated	Cheated
Condition HL	0.171** (0.076)	0.171** (0.073)	0.179** (0.076)	0.202** (0.084)	0.166* (0.089)	0.155* (0.088)
Constant	-0.552*** (0.045)	-0.293** (0.115)	-0.559*** (0.050)	-0.235*** (0.081)	-0.547*** (0.053)	-0.522*** (0.139)
Controls		✓		✓		✓
Observations	988	986	923	921	951	949

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2: Treated sample: OLS regression of the propensity to cheat given the opportunity to do so on condition indicators. Controls include: age, gender, education level (=1 if complete high school), equivalent household income, worker (=1 if in the labour force) and region fixed effects.

	(1)	(2)	(3)	(4)	(5)	(6)
	HH_LL		HH_LH		LL_LH	
VARIABLES	Cheated	Cheated	Cheated	Cheated	Cheated	Cheated
Condition LL	0.005 (0.085)	0.009 (0.085)				
Condition LH			-0.007 (0.064)	-0.010 (0.071)	-0.012 (0.084)	-0.025 (0.090)
Constant	-0.552*** (0.045)	-0.372*** (0.125)	-0.552*** (0.045)	-0.030 (0.125)	-0.547*** (0.053)	-0.075 (0.140)
Covariates		✓		✓		✓
Observations	961	959	933	928	896	894

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Treated sample, pt. 2: OLS regression of the propensity to cheat given the opportunity to do so on condition indicators. Controls include: age, gender, education level (=1 if complete high school), equivalent household income, worker (=1 if in the labour force) and region fixed effects.

Tables 4 and 5 repeat the analysis for the subsample which did not update beliefs, or did so in the direction opposite to what was expected. The effects uncovered earlier cannot be found here.

	(1)	(2)	(3)	(4)	(5)	(6)
	HH_HL		LH_HL		LL_HL	
VARIABLES	Cheated	Cheated	Cheated	Cheated	Cheated	Cheated
Condition HL	-0.033 (0.093)	-0.033 (0.094)	-0.140 (0.100)	-0.159 (0.127)	-0.134 (0.144)	-0.133 (0.162)
Constant	-0.678*** (0.082)	-0.301 (0.192)	-0.571*** (0.071)	-0.680*** (0.182)	-0.577*** (0.073)	-1.065*** (0.127)
Controls		✓		✓		✓
Observations	440	440	496	495	505	504

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Untreated sample. OLS regression of the propensity to cheat given the opportunity to do so on condition indicators. Controls include: age, gender, education level (=1 if complete high school), equivalent household income, worker (=1 if in the labour force) and region fixed effects.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	HH_LL		HH_LH		LL_LH	
	Cheated	Cheated	Cheated	Cheated	Cheated	Cheated
Condition LL	0.101 (0.119)	0.108 (0.126)				
Condition LH			0.108 (0.107)	0.141 (0.135)	0.006 (0.112)	0.003 (0.125)
Constant	-0.678*** (0.082)	-1.156*** (0.213)	-0.678*** (0.082)	-0.812*** (0.171)	-0.577*** (0.073)	-1.207*** (0.108)
Covariates		✓		✓		✓
Observations	467	466	458	457	523	520

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Untreated sample, pt. 2. OLS regression of the propensity to cheat given the opportunity to do so on condition indicators. Controls include: age, gender, education level (=1 if complete high school), equivalent household income, worker (=1 if in the labour force) and region fixed effects.

We summarise these findings in Result 1:

Result 1. *Cheating is significantly higher in experimental conditions presenting top income earners as engaging more severely in tax malpractice compared to low income earners.*

Result 1 sustains Hypothesis 2a. Notice that from columns 1 and 2 of Table 3 comparing conditions HH and LL we cannot find evidence in support of Hypothesis 1. This finding should not surprise: As pointed out earlier, a non-specialist individual taking our survey has no clear preconceived idea about what a plausible estimate for income under-reporting is. This suspicion is confirmed by the distribution of prior beliefs in Figure 1.

4.1 The impact of belief updating

We now investigate belief updating as a mechanism for the effects observed in Section 4. In building our belief updating measure, we want to weight the observations such that analogous updates occurring at relatively low levels are weighted more than at higher levels. Concretely, imagine a person i with prior belief that some group does not report 20% of their income on average, and suppose that the same person updates their belief to 25% after being administered one of our experimental conditions. This update is equivalent to one fourth of the prior belief. Now imagine that another person j updates their belief by the same amount (in percentage points)

in the same direction, say from 60% to 65%. Person j 's belief update corresponds to one-twelfth of their prior belief. For this reason, we apply greater weight to belief updates (BU) initiating from relatively low priors by dividing the update by the prior itself: $BU_k = \frac{(\text{posterior}_k - \text{prior}_k)}{\text{prior}_k}$, where $k \in \{\text{low income}, \text{high income}\}$ according to whether the prior and posterior beliefs refer to the unreported income of low or high income individuals. Notice that BU_k is positive whenever beliefs are updated upwards (towards a greater proportion of unreported income).

We adopt an instrumental variable approach to extract the exogenous component of belief updates due to our experimental variation (Fuster and Zafar, 2022). In the first stage of the two-stages-least-squares approach we regress our measure of belief updates on the experimental condition indicators, and regress the cheating indicator on the first stage predicted belief update values (thus netted out of any endogenous components) in the second stage.

VARIABLES	(1) cheated	(2) Bottom beliefs	(3) Top beliefs	(5) cheated	(6) Bottom beliefs	(7) Top beliefs
First stage						
Condition HL		-0.866*** (0.262)	0.421** (0.190)		-0.816*** (0.284)	0.413** (0.191)
Condition LH		0.495** (0.214)	-0.854*** (0.112)		0.468** (0.227)	-0.850*** (0.103)
Condition LL		-0.862*** (0.196)	-0.715*** (0.151)		-0.844*** (0.202)	-0.731*** (0.153)
Second stage						
Beliefs about bottom earners	-0.049 (0.052)			-0.060 (0.051)		
Beliefs about top earners	0.095* (0.056)			0.093* (0.055)		
Constant	-0.456*** (0.076)	1.351*** (0.160)	0.559*** (0.110)	-0.251*** (0.086)	1.144*** (0.164)	0.476* (0.260)
Covariates				✓	✓	✓
Observations	1,870	1,870	1,870	1,866	1,866	1,866

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 6: Treated sample: Instrumental variable probit regression of propensity to cheat given the opportunity to do so. The table displays the first and second stage regressions in an instrumental variable probit analysis of the propensity to cheat. Our belief updating measure, $BU_k = \frac{(\text{posterior}_k - \text{prior}_k)}{\text{prior}_k}$, $k \in \{\text{low income}, \text{high income}\}$ is instrumented by the condition indicators. Controls include: age, gender, education level (=1 if complete high school), equivalent household income, worker (=1 if in the labour force) and region fixed effects.

The second stage regressions in Table 6 show that indeed the propensity to cheat increases with upward belief updates about the top income earners but appears unaffected by beliefs about the bottom income earners.

Table 7 repeats the analysis for the untreated subsample. As expected, the relationship uncovered in Table 6 cannot be observed.

VARIABLES	(1) cheated	(2) Bottom beliefs	(3) Top beliefs	(5) cheated	(6) Bottom beliefs	(7) Top beliefs
First stage						
Condition HL		-0.023 (0.064)	-0.029 (0.048)		-0.011 (0.064)	-0.022 (0.049)
Condition LH		0.069 (0.129)	0.072* (0.038)		0.079 (0.138)	0.083** (0.034)
Condition LL		-0.012 (0.077)	0.213 (0.193)		-0.001 (0.081)	0.213 (0.185)
Second stage						
Beliefs about bottom earners	0.606 (0.704)			0.600 (0.811)		
Beliefs about top earners	0.192 (0.415)			0.220 (0.480)		
Constant	-0.467 (0.292)	0.155*** (0.052)	0.055** (0.024)	-0.816*** (0.313)	0.405*** (0.094)	0.164*** (0.056)
Covariates				✓	✓	✓
Observations	957	957	957	957	957	957

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 7: Untreated sample: Instrumental variable probit regression of propensity to cheat given the opportunity to do so. The table displays the first and second stage regressions in an instrumental variable probit analysis of the propensity to cheat. Our belief updating measure, $BU_k = \frac{(\text{posterior}_k - \text{prior}_k)}{\text{prior}_k}$, $k \in \{\text{low income}, \text{high income}\}$ is instrumented by the condition indicators. Controls include: age, gender, education level (=1 if complete high school), equivalent household income, worker (=1 if in the labour force) and region fixed effects.

We summarise these findings in Result 2.

Result 2. *Cheating rates increase significantly with upward updating of beliefs about tax malpractice of high income individuals.*

Result 2 further strengthens the arguments in support for Hypothesis 2a.

4.2 Broader impact (tentative section title)

In this section we review our findings of the broader impact of our intervention beyond cheating behaviours.

4.2.1 Perceived norms of tax compliance

To gather information about perceived norms of tax compliance, we adopted and adapted the well-known method proposed by Krupka and Weber (2013) to the data

collected in the 5th wave World Value Survey (WVS) in Italy (Inglehart et al., 2014). Each respondent was told that a previous survey of a representative sample of the Italian population asked the participants to rank the appropriateness of 4 actions by assigning them a number between 1 (totally inappropriate) and 10 (totally appropriate). The actions to be evaluated were: “Claiming undue benefits”, “Free riding on public transportation”, “Evading taxes”, “Taking bribes in the exercise of one’s duty”.

We asked our respondents to provide their best guess of the most frequently assigned appropriateness level in that survey and incentivised correct guesses with 10 additional Points. Given the ordinal nature of the ranking, greater guesses correspond to perceptions of greater acceptance of the action, or conversely perceptions of weaker norms prohibiting it.

Figure 2 displays the proportion of respondents who correctly identify the norm, for each action, by experimental condition. Because the modal value assigned to all four items in the WVS is 1, the proportion of respondents correctly identifying it is an appealing first, crude measure of norm perceptions: Incorrect guesses can only be assigning greater appropriateness norms. We notice that the proportion of correct guesses are fairly stable across conditions, with the exception of norms about tax evasion which seem to decrease in correspondence with condition LH.

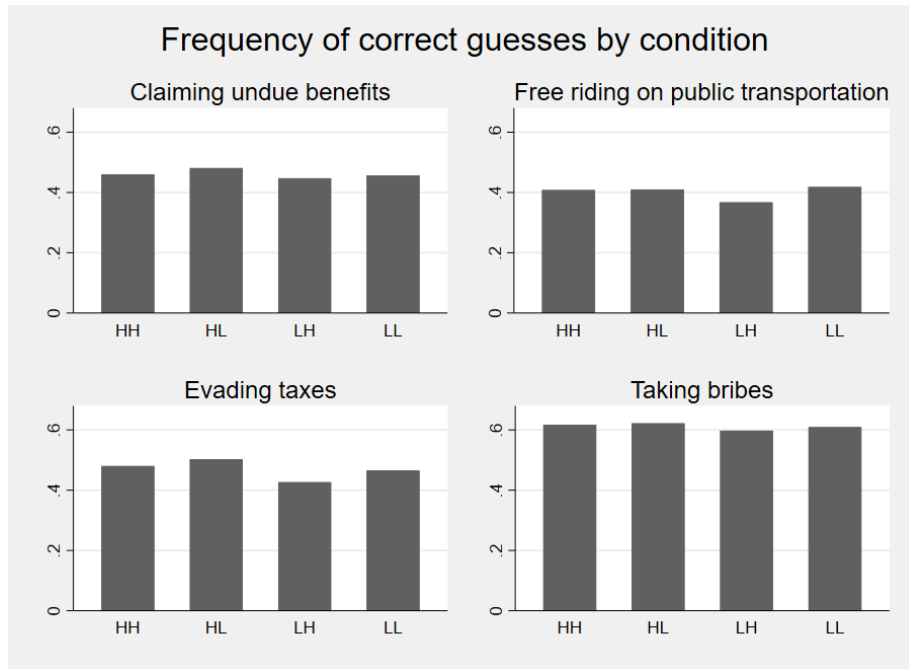


Figure 2: Proportion of respondents correctly identifying the norm (lowest appropriateness rating) for each action, by experimental condition.

We henceforth focus on perceived norms about tax evasion.¹¹ Tables 8 and 9 perform an analysis analogous to the ones presented in Section 4. Perceived norms of tax compliance seem to weaken with Condition LH as can be seen in columns 3 and 4 of Table 8 and columns 5 and 6 of Table 9. This finding, while at odds with our hypothesis, is understandable in light of the specific nature of the outcome measured and suggests that our respondents perceive the “bottom” income earners are a far larger group than the top income earners.¹² It is thus unsurprising that receiving information that the former hide a much larger share of their income than the latter will adversely shift perceptions of tax compliance norms.¹³

¹¹The analysis of the other items (in Appendix B.2) doesn’t yield any insight and is hence not reported. The output is available on request.

¹²We are deliberately vague as to how the two groups (top and bottom income earners) are defined and how big those two groups are in our information conditions. If people think in top and bottom percentiles, they might think that the two groups are of equal size. Should they instead have a skewed income distribution in mind, they might think that “bottom income earners” are a larger group compared to “top income earners”.

¹³We omit the output of analogous regressions on the untreated sample for brevity. The output is available on request.

VARIABLES	(1)	(2)	(3) Norms about tax compliance		(5)	(6)
	HH_HL	HH_HL	LH_HL	LH_HL	HL_LL _a	HL_LL _b
Condition HL	-0.261 (0.221)	-0.233 (0.222)	-0.310* (0.163)	-0.319** (0.148)		
Condition LL					-0.005 (0.125)	-0.025 (0.138)
Constant	4.076*** (0.153)	4.749*** (0.326)	4.124*** (0.141)	4.701*** (0.299)	3.815*** (0.140)	4.986*** (0.285)
Controls		✓		✓		✓
Observations	1,218	1,218	1,122	1,122	1,150	1,150
R-squared	0.002	0.021	0.002	0.037	0.000	0.039

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Treated sample: OLS regression of tax compliance norm perceptions. Controls include: age, gender, education level (=1 if complete high school), equivalent household income, worker (=1 if in the labour force) and region fixed effects.

VARIABLES	(1)	(2)	(3) Norms about tax compliance		(5)	(6)
	HH_LL	HH_LL	HLLH	HLLH	LL_LH	LL_LH
Condition LL	-0.266 (0.166)	-0.237 (0.153)				
Condition LH			0.048 (0.182)	0.059 (0.175)	0.315** (0.130)	0.334** (0.133)
Constant	4.076*** (0.153)	4.617*** (0.273)	4.076*** (0.153)	4.025*** (0.327)	3.809*** (0.088)	3.901*** (0.240)
Controls		✓		✓		✓
Observations	1,170	1,170	1,142	1,142	1,074	1,074
R-squared	0.002	0.024	0.000	0.022	0.003	0.045

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9: Treated sample, pt. 2: OLS regression of tax compliance norm perceptions. Controls include: age, gender, education level (=1 if complete high school), equivalent household income, worker (=1 if in the labour force) and region fixed effects.

Table 10 reports the output of instrumental variable regressions investigating the mediating role of belief updating on norm perceptions. Confirming the results in Table 9, we find a strong and significant impact of updates on beliefs about the bottom income earners' share of hidden income.

VARIABLES	(1)	(2)	(3)	(4)
	Norm about tax compliance			
	Treated	Untreated		
Beliefs about bottom earners	0.240** (0.099)	0.234** (0.097)	6.806 (11.537)	6.370 (9.508)
Beliefs about top earners	0.040 (0.082)	0.026 (0.084)	0.576 (2.021)	0.472 (1.803)
Constant	3.704*** (0.107)	4.393*** (0.187)	3.212* (1.921)	1.421 (3.856)
Controls		✓		✓
Observations	2,275	2,275	1,120	1,120

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10: Treated sample, pt. 2: Instrumental variable regression of tax compliance norm perceptions. The table displays the second stage regressions in an instrumental variable analysis of perceived tax compliance norms. Our belief updating measure, $BU_k = \frac{(posterior_k - prior_k)}{prior_k}$, $k \in \{low\ income, high\ income\}$ is instrumented by the condition indicators. Controls include: age, gender, education level (=1 if complete high school), equivalent household income, worker (=1 if in the labour force) and region fixed effects.

4.2.2 Generalised social trust

We elicited the respondents’ level of generalised social trust by borrowing the question used in the World Value Survey (Inglehart et al., 2014). We asked the respondents to answer the question “In general, would you say that most people can be trusted or that one can never be careful enough?” on a scale from 1 (complete distrust) to 10 (complete trust).¹⁴

Tables 11 and 12 present the result of our pairwise condition comparisons. We find preliminary evidence that greater values of stated generalised trust can be observed when tax malpractice is unambiguously low, in a comparison of conditions LL and HH (columns 1 and 2 of Table 12). Different from cheating behaviours (an intrinsically individual choice) or norm perceptions (descriptive normative beliefs about accepted or rejected behaviours by the average individual) we do not observe any asymmetry with respect to antisociality on behalf of top and bottom income groups. High (perceived) prevalence of tax malpractice, irrespective of its group of origin, erodes social trust. These results should be taken with caution in light of the considerations made earlier about the lack of a benchmark allowing the respondents to contextualise and interpret the information they receive. For this reason, we further explore this finding using the instrumental variable technique used earlier to tie belief updating

¹⁴For the purpose of the analysis, we inverted the scale used in the survey for larger values to correspond to greater trust.

to stated trust.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	HH_HL	HH_HL	Generalised social trust LH_HL	LH_HL	HL_LL	HL_LL
Condition HL	0.021 (0.126)	0.001 (0.122)	-0.016 (0.079)	0.019 (0.090)		
Condition LL					0.190 (0.154)	0.154 (0.147)
Constant	-6.716*** (0.083)	-7.264*** (0.237)	-6.679*** (0.080)	-7.868*** (0.173)	-6.694*** (0.126)	-7.117*** (0.189)
Observations	1,218	1,218	1,122	1,122	1,150	1,150
R-squared	0.000	0.044	0.000	0.050	0.002	0.058

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 11: Treated sample: OLS regression of tax compliance norm perceptions. Controls include: age, gender, education level (=1 if complete high school), equivalent household income, worker (=1 if in the labour force) and region fixed effects.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	HH_LL	HH_LL	Generalised social trust HH_LH	HH_LH	LL_LH	LL_LH
Condition LL	0.211* (0.101)	0.186* (0.096)				
Condition LH			0.037 (0.105)	-0.007 (0.098)	-0.174 (0.113)	-0.180 (0.117)
Constant	-6.716*** (0.083)	-6.885*** (0.181)	-6.716*** (0.083)	-7.613*** (0.255)	-6.505*** (0.090)	-7.401*** (0.255)
Controls		✓		✓		✓
Observations	1,170	1,170	1,142	1,142	1,074	1,074
R-squared	0.002	0.061	0.000	0.040	0.001	0.059

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 12: Treated sample, pt. 2: OLS regression of tax compliance norm perceptions. Controls include: age, gender, education level (=1 if complete high school), equivalent household income, worker (=1 if in the labour force) and region fixed effects.

Table 13 presents the results from our instrumental variable investigation. Indeed we observe upward belief updates about the tax malpractice of both income groups significantly eroding social trust.

VARIABLES	(1)	(2)	(3)	(4)
		Generalised social trust		
		Treated	Untreated	
Beliefs about bottom earners	-0.101* (0.053)	-0.102* (0.057)	1.149 (3.426)	2.036 (3.769)
Beliefs about top earners	-0.133* (0.077)	-0.097 (0.071)	0.620 (0.594)	0.510 (0.567)
Constant	-6.495*** (0.099)	-7.129*** (0.166)	-6.763*** (0.513)	-7.707*** (1.518)
Controls		✓		✓
Observations	2,275	2,275	1,120	1,120

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 13: Treated sample, pt. 2: Instrumental variable regression of generalised social trust. The table displays the second stage regressions in an instrumental variable analysis of generalised social trust. Our belief updating measure, $BU_k = \frac{(posterior_k - prior_k)}{prior_k}$, $k \in \{low\ income, high\ income\}$ is instrumented by the condition indicators. Controls include: age, gender, education level (=1 if complete high school), equivalent household income, worker (=1 if in the labour force) and region fixed effects.

5 Discussion and concluding remarks

This paper presents large-scale experimental evidence from a representative sample of the Italian population offering an insight into whether systematic asymmetric (conditional) shifts in behaviours and in norms of behaviour can be observed in response to variation in information about tax evasion at the top and at the bottom of the income distribution.

We find that respondents' propensity to cheat (towards the experimenter) increases whenever tax malpractice is presented as more severe among high income than low income individuals. Instrumenting the change in participants' beliefs with the experimental conditions, we find that larger upwards updates are associated with a greater propensity to cheat. Moreover, we observe that individuals correctly shift their perception of the tax compliance norm, in that it is perceived as weaker whenever low income earners, the largest among the two groups, are presented as engaging in more severe tax malpractice. This result is confirmed in an instrumental variable analysis of beliefs. Finally, we observe that social trust declines significantly at overall higher levels of tax malpractice, without asymmetries with respect to income. This finding is once again confirmed to be mediated at least in part by shifts in the participants' beliefs.

The salience of tax (dis)honesty has risen sharply in the past few years following the data leaks about tax evasion and avoidance via international tax havens (Garside, 2016). Since unethical practices in tax compliance are most profitable and diffuse

among the highest income ranks (Alstadsæter et al., 2019), news reporting on the topic has naturally mainly been centred on the upper end of the income distribution. As a result tax malpractice on behalf of the upper echelons of our societies has received greater resonance and political and popular interest than tax dishonesty on behalf of lower portions of the income distribution. Our paper shows that such impartial focus might well be consequential for the behavioural responses to tax malpractice throughout society, particularly on the propagation of (un)ethical behaviours.

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Appendix

A Graphs

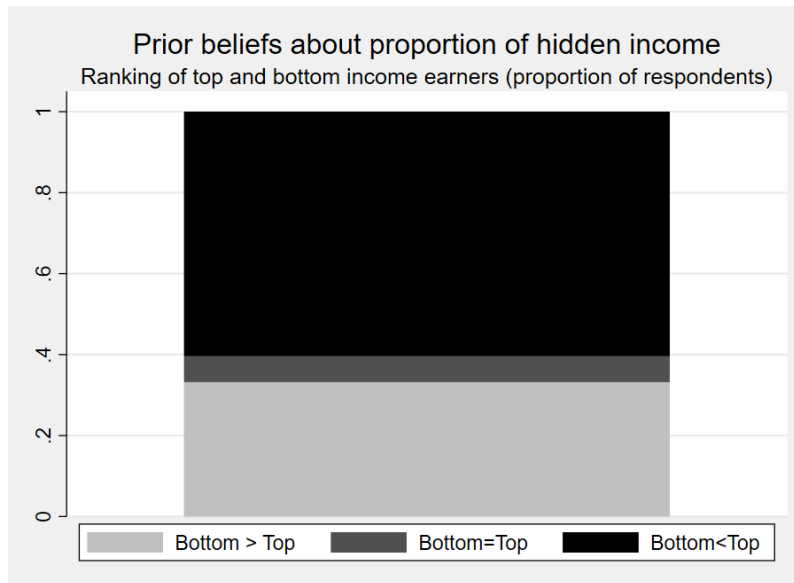


Figure A1: Proportion of subjects ranking top and bottom income earners according to the size of the proportion of hidden income.

B Further analyses

B.1 OLS regression on all condition indicators

Table B1 regresses an indicator for having cheated in the die rolling game on all condition indicators. The results here presented confirm those obtained in pairwise comparisons in Section 4.

VARIABLES	(1)	(2)	(3)	(4)
	Treated sample Cheated	Treated sample Cheated	Untreated sample Cheated	Untreated sample Cheated
<u>Baseline: Condition HL</u>				
Condition HH	-0.171** (0.076)	-0.166** (0.071)	0.033 (0.092)	0.021 (0.095)
Condition LH	-0.179** (0.076)	-0.190** (0.080)	0.140 (0.100)	0.145 (0.114)
Condition LL	-0.166* (0.089)	-0.156* (0.085)	0.134 (0.144)	0.144 (0.160)
Constant	-0.381*** (0.061)	-0.113 (0.093)	-0.711*** (0.090)	-1.003*** (0.152)
Controls		✓		✓
Observations	1,884	1,880	963	963

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table B1: OLS regression of the propensity to cheat on all condition indicators. Controls include: age, gender, education level (=1 if complete high school), equivalent household income, worker (=1 if in the labour force) and region fixed effects.

B.2 Further norms of behaviour

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	a1 action1	a1b action1	a2 action2	a2b action2	a4 action4	a4b action4
Condition = 1	0.176 (0.271)	0.168 (0.266)	-0.065 (0.194)	-0.068 (0.166)	0.003 (0.167)	-0.034 (0.157)
Condition = 3	-0.074 (0.205)	-0.049 (0.211)	-0.026 (0.183)	-0.003 (0.164)	-0.076 (0.138)	-0.100 (0.132)
Condition = 4	-0.100 (0.162)	-0.075 (0.158)	-0.176 (0.173)	-0.140 (0.157)	-0.150 (0.127)	-0.135 (0.128)
Constant	3.913*** (0.182)	4.281*** (0.399)	4.297*** (0.162)	5.648*** (0.277)	3.002*** (0.142)	3.599*** (0.294)
Observations	2,292	2,292	2,292	2,292	2,292	2,292
R-squared	0.001	0.033	0.000	0.051	0.000	0.038

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table B2: Correctly updated beliefs

C Experimental conditions

Condition Neutral Condition Neutral mentions tax malpractice to make the phenomenon salient to the individual, without providing any further information.

The media usually provide discussions on many topics of current interest, including tax malpractice.

Please answer the following questions.

Figure C2: Information provided in the Neutral condition

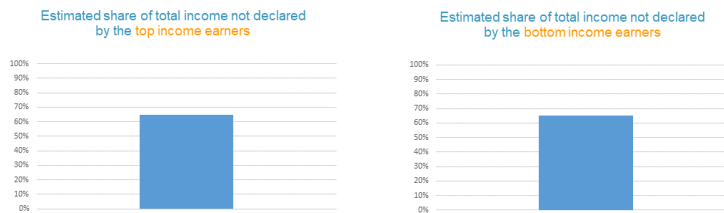
Condition HH Condition HH instead adds information about the proportion of income which remains undeclared by the top and bottom income earners. The proportion provided is high (65%) for both groups. We randomised the order of presentation to control for order effects.

The media usually provide discussions on many topics of current interest, including tax malpractice.

We have recently surveyed a group of economists in Italy. Some of them estimate that:

(a)

Among top and bottom income earners in Italy more than half (around 65%) of their total income remains undeclared



(b)

Figure C3: Information provided in Condition HH

Condition HL Condition HL adds information about the proportion of income which remains undeclared by the top and bottom income earners. This time proportion provided is high (65%) for top income earners and low (25%) for low income earners. We randomised the order of presentation to control for order effects.

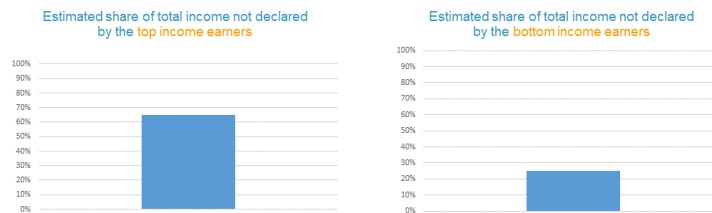
The media usually provide discussions on many topics of current interest, including tax malpractice.

We have recently surveyed a group of economists in Italy. Some of them estimate that:

(a)

Among **top income earners** in Italy more than half (around **65%**) of their total income remains undeclared

Among **bottom income earners** in Italy less than half (around **25%**) of their total income remains undeclared



(b)

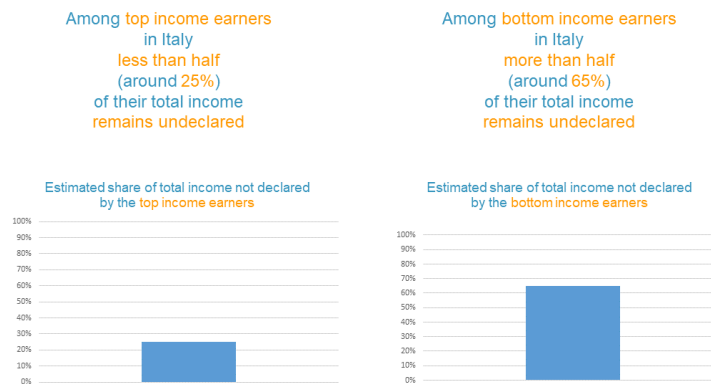
Figure C4: Information provided in Condition HL

Condition LH Condition LH adds information about the proportion of income which remains undeclared by the top and bottom income earners. This time proportion provided is low (25%) for top income earners and high (65%) for low income earners. We randomised the order of presentation to control for order effects.

The media usually provide discussions on many topics of current interest, including tax malpractice.

We have recently surveyed a group of economists in Italy. Some of them estimate that:

(a)



(b)

Figure C5: Information provided in Condition LH

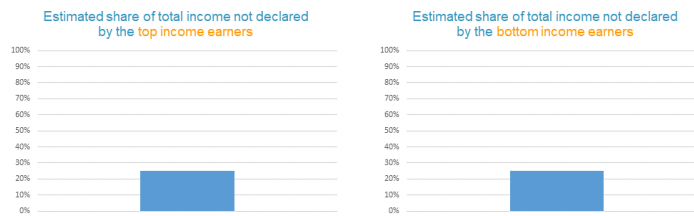
Condition LL Condition LL instead adds information about the proportion of income which remains undeclared by the top and bottom income earners. The proportion provided is low (25%) for both groups. We randomised the order of presentation to control for order effects.

The media usually provide discussions on many topics of current interest, including tax malpractice.

We have recently surveyed a group of economists in Italy. Some of them estimate that:

(a)

Among **top and bottom income earners** in Italy **less than half** (around **25%**) of their total income **remains undeclared**



(b)

Figure C6: Information provided in Condition LL

D Survey questionnaire

Notes for the reader:

- Below is a transcription of the survey text, translated into English.
- Statements closed into [...] are comments included for the reader and were not displayed in the actual survey

We are non-partisan researchers from an independent research institute.

We would like to know your **personal views** on matters of public interest.

It is very important that you provide your **true opinion**, and that you **read all the questions very carefully before answering**. If you do not know the answer to some question, please provide us with your best guess.

It is very important that you **complete the entire survey**, once you've started. Not completing the survey will cause you not to receive your payment. The entire survey should take approximately 10 minutes to complete.

Note: Your participation in this study is purely voluntary. No identifying information will be recorded by the researchers. Results may include summary data, but you will never be identified. The data will be stored on our servers and will be kept confidential. The anonymous data collected may be made available to other researchers for replication purposes.

1.
 - a. Yes, I would like to participate
 - b. No, I don't want to participate
2. What is your gender? (M/F)
3. Please indicate your age:
4. What is your province of residence?
5. What is your marital status?
 - a. Single (Never Married/Widowed/Separated/Divorced)
 - b. Married /Civil partnership/Cohabiting
6. Where do you see yourself on the political spectrum, where 1 represents the left and 10 represents the right?
7. Please indicate how many people live in your household (including yourself): Adults... Children...
8. What is the combined **monthly** income of your **household, after taxes**?
[Please include all your household income sources: salaries, scholarships, pension and Social Security benefits, dividends from shares, income from rental properties, child support and alimony etc. We are not interested in the type of income source, only in the total monthly income earned by all the members of your household together.]
 1. <1000
 2. 1000-2000
 3. 2000-3000
 4. 3000-4000
 5. 4000-5000
 6. 5000-6000
 7. 6000-8000
 8. 8000-10000
 9. >10000

The next question is about your household and how you think it compares to other households of the same size across Italy. When we say 'same size' we mean number of people rather than the physical size of a home. As a reminder, you have stated that your household contains <INSERT FROM TOTAL NUMBER FROM HHSIZE> people, including any children.

When answering these questions please think about how your household of <INSERT FROM TOTAL NUMBER FROM HHSIZE> people, compares to other households of <INSERT FROM TOTAL NUMBER FROM HHSIZE> people.

You previously said your monthly household income is <INSERT>.

9. What percentage of Italian households of your size, if any, do you think had a **higher** household income than your household income?
If you are unsure, please give your best estimate.

The mass media generally offer debates on many topics, including tax malpractice.

[Prior belief elicitation, randomized order]

10. Please provide your best estimate of the share of total income that remains undeclared in Italy by:
a. Those who earn the highest incomes
11. Please provide your best estimate of the share of total income that remains undeclared in Italy by:
a. Those who earn the highest incomes

[Information condition display here (see Information conditions Appendix)]

[Attention questions, randomized order]

Please re-enter the information you have seen on the previous page.

12. The surveyed economists estimate that those earning the highest incomes don't declare what percentage of their total income?
a. Around <enter amount>%
13. The surveyed economists estimate that those earning the highest incomes don't declare what percentage of their total income?
a. Around <enter amount>%
14. Which media do you most frequently get information on world happenings from?
(If you don't find your preferred outlet, please indicate the one that most closely represents it)
- a. TV News
 - b. Social media (social networks, blogs)
 - c. Radio/podcasts
 - d. Online newspaper/newspaper app
 - e. Print newspaper
 - f. I don't follow the news
15. What is the highest level of education you have completed?
- a. Primary school
 - b. Junior high school (middle school)
 - c. Professional education
 - d. High school (science/humanities)
 - e. Bachelor degree
 - f. Master's degree
 - g. Doctoral degree
16. Which party would you vote for should national general elections happen next week?
- a. Partito Democratico
 - b. Lega
 - c. Movimento a 5 Stelle
 - d. Forza Italia
 - e. Italia Viva
 - f. Fratelli d'Italia
 - g. Other
 - h. I wouldn't vote

17. What is your current employment status?
- Employed full-time
 - Employed part-time
 - Self-employed/small business owner
 - Unemployed and looking for a job
 - Not working and not looking for a job/Long-term sick or disabled
 - Full-time parent, homemaker
 - Retired
 - Student/Pupil

18. Were you born in Italy?

19. Were both of your parents born in Italy?

20. Which party would you vote for if there were elections on Sunday?

The video displayed just above was randomly selected by the software among the six videos displaying the six possible outcomes of a six faced die roll.

The result you see was hence obtained as if a die had been actually rolled. You can watch the video again if necessary.

Your task is to tell us what result you are seeing.

You will receive an additional payment of 25 Points by reporting that the outcome is 6.

Should you tell us that the outcome is not 6, you receive no additional payment.

21. What is the outcome of the die roll?

You can receive an additional payment of 15 Points by answering the 4 questions below correctly. Read the instructions carefully.

In a previous survey study conducted in Italy, a representative sample of the resident population was asked for their opinion about a number of actions. In particular, for each of the following actions they were asked on a scale from 1 to 10 whether they thought it can always be justified (10), never be justified (1), or something in between.

Your task is to guess which evaluation was provided most frequently in that survey.

One of the four questions will be **randomly selected** once you've completed the questionnaire.

If your answer to the selected question will turn out to be correct (that is, if you've correctly guessed which evaluation was most frequently assigned to it in the previous survey), you will receive an additional payment of 15 Points.

Because you don't know which question will be selected, you should answer each question as if that question will be the one determining your payment.

22. Claiming government benefits to which you are not entitled.

The most frequent answer in the previous survey was that "claiming government benefits to which you are not entitled" is:

23. Avoiding a fare on public transport.

The most frequent answer in the previous survey was that "avoiding a fare on public transport" is:

24. Cheating on taxes if you have a chance.

The most frequent answer in the previous survey was that "Cheating on taxes if you have a chance" is:

25. Someone taking a bribe in the course of their duty.

The most frequent answer in the previous survey was that "Someone taking a bribe in the course of their duty" is:

Martinangeli and Windsteiger - Cheating responses to tax evasion

Now we would like to ask you for your opinion on the following statements. Please rate them on a scale from 1 to 10, where 1 means you completely disagree and 10 that you completely agree.

26. People can only get rich at the expense of others.
27. Hard work is one of the most important values to succeed in life.
28. Redistribution is among the most important tasks for a government.

29. Would you say your tax rate is too high, somewhat high, correct, somewhat low or too low? [The answers were randomly flipped]
 - a. Too high
 - b. Somewhat high
 - c. Correct
 - d. Somewhat low
 - e. Too low

30. More generally, would you say that the tax rate in Italy is too high, somewhat high, correct, somewhat low or too low? [The answers were randomly flipped]
 - a. Too high
 - b. Somewhat high
 - c. Correct
 - d. Somewhat low
 - e. Too low

Now we would like to ask you for your opinion on the following statements.

31. Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people? ($1=$ most people can be trusted/ $10=$ Need to be very careful)
32. Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair? ($1=$ most people would take advantage/ $10=$ people would be fair)

[Posterior belief elicitation, randomized order]

33. Please provide your best estimate of the share of total income that remains undeclared in Italy by:
 - a. Those who earn the highest incomes
34. Please provide your best estimate of the share of total income that remains undeclared in Italy by:
 - b. Those who earn the highest incomes

Not long ago you saw a video with the outcome of a die roll and you were asked to report the outcome. With an outcome of 6, you would receive an additional payment.

35. Did you realise that you could have lied without consequence?
(That is, that you could have reported an outcome of 6 independent of the outcome actually displayed, and thus receiving the additional payment without any consequence?)
 - a. Yes, I had realised
 - b. No, I hadn't realised

36. Still in the question about the die roll, we are able to check the truthfulness of the report by matching the report with the video displayed (though without being able to identify who made the report).

Regardless of whether you had realised you could have lied, did you realise we could have checked the truthfulness of the report?

- a. Yes, I had realised
- b. No, I hadn't realised

[Debriefing information, displayed to all participants]

The information you received during this survey are based solely on **subjective** estimates provided by a group of economists on the proportion of undeclared income among different income segments of the Italian population.

These estimates do not reflect the opinion of all the interviewed economists, nor the opinion of the researchers who designed this survey.

Moreover, these estimates are not based necessarily on scientifically or statistically sound evidence.

There is a great deal of uncertainty among the scientific community about the actual incidence of tax evasion or avoidance in Italy, and a lively debate is ongoing on how to correctly measure it. Official estimates and evidence are hence hard to gather.

Nonetheless, plausible estimates based on scientific and statistical evidence place the proportion of undeclared income in Italy **between 10 and 20% of total income**.