



Regional variation in tax compliance and the role of culture

Alice Guerra¹ · Brooke Harrington²

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Abstract

This research note analyzes the role of culture on individuals' tax compliance by focusing on regional differences within a single country: Italy. Southern Italy has long been a focus of research interest, not only for its high rates of tax evasion, but for a host of other social and political ills, all usually attributed to regional culture. Our laboratory tax compliance experiment, conducted in provinces of the northern and southern regions, reveals that taxpayers in the north and south generally behaved alike both in terms of average compliance rates and individuals' sensitivity to changes in tax structures—except for lower responsiveness to greater redistribution of tax revenues among subjects in Salerno than those in Bologna. This suggests the limited explanatory power of culture in tax compliance in favor of institutional explanations.

Keywords Tax compliance · Lab experiment · Regional differences

JEL classification H2 · H3 · C9

1 Introduction

This research note responds to calls for a finer-grained investigation of culture's impact on taxpayers by looking at within-country differences (Torgler, 2016; D'Attoma, 2017, 2019, 2020). Italy offers a compelling case: the south accounts for a disproportionate amount of the country's 30% tax gap, which cost Italy €107.5 bil-

✉ Alice Guerra
alice.guerra3@unibo.it

¹ Department of Economics, University of Bologna, Rimini Campus, Via Angherà 22, 47921 Rimini, RN, Italy

² Department of Sociology, Dartmouth College, Hanover, New Hampshire, United States

lion in 2016 (Salzano & Speciale, 2019). In addition, tax evasion rates are as much as three times higher in the south than in the north (Fiorio & Zanardi, 2008; see also Barone and Mocetti, 2011; Becchetti et al., 2017; Albarea et al., 2020).

This large and consistent regional divide is frequently attributed to culture (Russo, 2013; D'Attoma, 2017, 2019; Hein, 2020; Hien, 2020)—an approach rooted in 60 years of research locating the source of southern Italy's many problems in social "backwardness," often referred to as amoral familism (Banfield & Fasano, 1958; Putnam, 1993; Bigoni et al., 2016).¹ In their influential contribution "The Moral Basis of a Backward Society," Banfield & Fasano (1958) argued that the origin of the north–south gap in Italy lies in the moral flaws of southerners, who are only concerned about their welfare and that of their immediate family members with no regards for anyone else.

Building on this literature, we compare taxpayers in two Italian regions: Emilia Romagna in the north and Campania in the south. We selected these regions for two main reasons. First, they have long been ranked at opposite extremes on tax compliance. According to the Italian Ministry of Economy and Finance (2021, p. 14), Campania is one of the Italian regions with the highest GDP-adjusted evasion rate (19.8% in 2018), whereas Emilia Romagna is among those with the lowest GDP-adjusted evasion rate (11.2% in 2018). Second, the two regions stand at opposite poles in terms of some proxies of social capital that might affect taxation-related behavior (Cartocci, 2007; Buonanno et al., 2009; Crescenzi et al. 2013; Bigoni et al., 2016; Casari et al., 2018; Alfano & Ercolano, 2021). Those proxies include trust in institutions and perceived quality of government: for both variables, Campania is at the lowest end of the spectrum, while Emilia Romagna is near the top (Teorell et al., 2011; Charron et al., 2013, 2014; Fazio et al., 2018; D'Attoma, 2019, p. 120).² Although both regions are subject to many of the same national formal institutions, Emilia Romagna and Campania differ significantly in their perceptions of fairness and legitimacy in government institutions (D'Attoma, 2019; D'Agostino et al., 2021).³

If culture affects tax compliance and responsiveness to varying tax policies, subjecting both groups to the same tax compliance game should result in statistically

¹ Other explanations on why southern Italians evade more taxes than northern Italians in the field includes low enforcement and/or low tax morale stemming from distrust in government and dissatisfaction with poor quality public services (Kirchler, 2007; D'Attoma, 2018, 2020).

² Some might question whether Emilia Romagna and Campania are representative of northern and southern regions. Would our results be different if comparing Lombardy in the north to Apulia in the south? We cannot, a priori, exclude this possibility, which calls for future replications of our experiment in other Italian regions. However, prior research on tax compliance in different Italian provinces suggests that this should not be a concern. For example, D'Attoma (2019) conducted tax compliance experiments similar to ours in Capua (a town close to Naples in Campania), Rome (Lazio), Milan (Lombardy), and Bologna. His results, like ours, show no statistically significant differences in tax compliance between subjects from the North vis-à-vis South. See also Andrighetto et al. (2016).

³ A growing body of research shows that social norms of tax compliance can be uniform within a society but can vary across countries and regions (Cummings et al., 2001; Torgler, 2005a,b; Alm & Torgler, 2006; Gerxhani & Schram, 2006; Andrighetto et al., 2016). This difference in social norms may explain differences in tax compliance across countries or regions (Bigoni et al., 2016; Casari et al., 2018; Ottone et al., 2018). More broadly, on the role of social norms in tax compliance, see, e.g., Alm et al. (1995); Wenzel (2005); Cullis et al. (2012); Bobek et al. (2007, 2013); Onu & Oats (2015).

significant behavioral differences (Ottone et al., 2018; D’Attoma, 2019).⁴ In other words, if individuals with identical incomes and risk preferences face the same incentives in a tax compliance decision, then any differences in compliance or responsiveness to incentive changes would be due to differences in culture.

Our results reveal no significant variation in overall tax evasion between northern and southern Italians. The only significant regional difference we find is that southern taxpayers are less responsive than northerners to increases in redistribution of tax revenues. This suggests the limited explanatory power of culture in tax compliance, and points toward institutional explanations, underscoring divergent regional experiences of state institutions as an explanatory variable.

Our findings are novel in two respects. First, they provide insight at the level of regional disparities *within nations*, which remains “a rather neglected area of research” (Brosio et al., 2002, p. 259; see also Knoll & Griffith, 2003; Albouy, 2009; Rattsø & Stokke, 2017). This neglect is particularly pronounced in comparison to the extensive *cross-national* literature questioning culture’s role in taxpayer behavior [e.g., Alm & Torgler, 2006; Torgler & Schneider, 2007; Lewis et al., 2009; Lefebvre et al., 2015; Guerra & Harrington, 2018; Ottone et al., 2018; Pampel et al., 2019; Guerra & Harrington, 2021 (for a review)].

Second, we contribute a robust test of the culture hypothesis by drilling down from the collective to the individual level of analysis. We look not only at the *average* compliance rate between regions (as in D’Attoma, 2019), but—uniquely—at the *sensitivity* of individuals in those regions to changes in tax structures thought to be influenced by culture. Whether culture can influence behavioral responses to changes in tax system parameters has remained thus far underexplored. Some insights come from Ottone et al. (2018), who investigated how people from Italy and Sweden react in the laboratory to the same changes in two institutional features of the tax system: redistribution of tax revenues, and tax rates (from 10 to 30 to 50%). They found that participants from both countries as well as from different locations within the same country (Milan, Bologna, and Rome in Italy), reacted similarly to changes in redistribution and tax rates. This suggests that institutional features play a more relevant role than cultural factors in determining taxpayers’ behavior. However, no laboratory in the south of Italy was involved in Ottone et al.’s (2018) experiment. Hence, while this evidence provides a baseline argument to further investigate this topic, it does not allow us to develop precise hypotheses on how culture could affect the sensitivity of individuals in the north versus south of Italy to changes in tax structures. As is common in these cases, we adopt an inductive approach: we let results emerge from our data without any prior theory or hypothesis to be tested (Amore et al., 2022).

Regarding tax policies, we consider not only redistribution and tax rates but—differently from Ottone et al. (2018) and D’Attoma (2019)—also audit probability, which our results show has a much stronger positive impact on tax compliance than tax rates and redistribution.

⁴ The strategy to isolate “culture” by taking the same game form and having different populations play it—and ascribing differences in behavior to culture—is common in economics experiments (e.g., Roth et al., 1991; Henrich, 2000).

Our findings innovate with respect to Ottone et al. (2018) and D'Attoma (2019) in showing that taxpayers in the north and south—while behaving alike in terms of average compliance rates—exhibit different sensitivity to a specific change in tax structures: those in the south are less responsive to greater redistribution than those in the north.

2 The experiment

The lab experiment involved a standard tax compliance game [Alm et al., 1992; Alm & Jacobson, 2007; Alm, 2012; Ottone et al., 2018; Alm & Malézieux, 2020 (for a review)], followed by a risk aversion elicitation task (Holt & Laury, 2002).⁵ The tax compliance game took place in three stages, each divided into three rounds. In each stage, participants earned income through a clerical task, then chose how much to report for tax purposes; they were informed in advance of the tax rate, audit probability, and redistribution policy. Those audited and caught underreporting their income had to pay a fine.

To avoid confounding effects due to past audits (Mittone, 2006; Kastlunger et al., 2009; Castro & Rizzo, 2014), audit results were revealed only at the end of the experiment. Importantly, participants received no feedback between rounds about the others' declaration of income or their audit rates. This procedure—which closely follows prior lab experiments analyzing the role of culture in tax compliance (e.g., Zhang et al., 2016; Guerra & Harrington, 2018; Ottone et al., 2018)—is meant to ensure confidentiality and mitigate the influence of conditional cooperation, reputation, reciprocity, or wealth effects, all of which lie beyond the scope of this research.⁶

⁵ As in other tax compliance experiments, we put the (risk elicitation) task *after* the main (tax compliance) game to ensure that participants' behavior in the main game was not contaminated by any expectations nor outcomes possibly formed during the task (Heinemann & Kocher, 2013; Tan & Yim, 2014; Casal et al., 2016; Choo et al., 2016; Bruner et al., 2017; Bernasconi & Bernhofer, 2020; Engel et al., 2020). Participants were not aware of the existence of the task beforehand: they were informed that the experiment consisted of multiple parts, but the instructions for the task were handed out only after the completion of the main game. In addition, participants were not told which period of the task was chosen for their payment. This was meant to make it difficult, if not impossible, to adjust lottery choices strategically based on decisions in the main game. Other studies elicited participants' risk preferences *before* the tax compliance game (Cummings et al., 2009; Coricelli et al., 2010; Castro & Rizzo, 2014; Lefebvre et al., 2015). In any case, running the task either before or after the main game should not constitute a major concern. Indeed, the main purpose of our research is not to evaluate the mere effects of risk preferences on compliance, but rather to analyze how individuals from different regions respond to the *same* institutional scenario while controlling for risk preferences and other characteristics. To this end, we had to guarantee that the order of the experimental parts was constant across the Bologna and Salerno settings. We cannot exclude a priori that playing several periods of a tax compliance game may affect the evaluation of the lotteries included in the Holt & Laury (2002) test. It would be interesting to explore this possibility in future research.

⁶ We deliberately choose this design to be sure that different levels of tax compliance across the rounds were only due to the experimental treatments, not the information about aggregate compliance level or audit results. For a similar design choice, see Ottone et al. (2018). Here, we are not interested in analyzing the effect of information about aggregate compliance level on individuals' compliance choices. This effect—which has already been explored in prior contributions (e.g., Lefebvre et al., 2015)—deserves further investigation in a cross-cultural perspective. For example, future studies on social norms of tax

Treatments varied redistribution, tax rate, and audit probability (see Fig. A1 in the supplementary material).⁷ The experimental design follows a within-subjects scheme (Castro & Rizzo, 2014; Ottone et al., 2018) to study individual responses to changes in tax structures. To ensure comparability across sites, we used the same sequence of rounds in the two locations.⁸ In Stage 1, the tax rate was 30%, audit probability 5%, and redistribution varied: none in Round (R)1; equal redistribution among participants in R2; and doubling of revenues followed by equal redistribution in R3. In Stage 2, audit probability remained at 5%, and tax revenues were equally redistributed, but the tax rate varied: 5% in R4, 30% in R5, and 50% in R6. In Stage 3, the tax rate was 30% and tax revenues were equally redistributed, but audit probability varied: 5% in R7, 30% in R8, and 50% in R9.⁹

We conducted 16 sessions: six at the Bologna Laboratory for Experiments in Social Science (BLESS), and seven at the Laboratory of the University of Salerno (LABESS). This was unknown to the participants. To further ensure comparability across sites, the design and procedure were identical in each case. Participants (all Italian natives) were recruited using ORSEE (Greiner, 2015) in Bologna, and HRoot (Bock et al., 2014) in Salerno. A total of 220 individuals (45.91% female) were recruited, of which 106 (48.18%) participated at BLESS. Sample descriptives are reported in Table A1 in the supplementary material, together with balance checks (Chiapello, 2018).

The practical procedures follow the standard protocols for laboratory economics experiments (e.g. Lefebvre et al., 2015). The experiment was computerized using

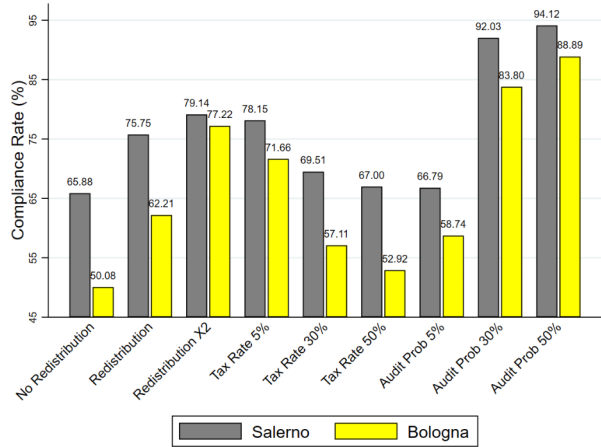
compliance could analyze whether providing this information would affect differences in individuals' tax compliance across countries or regions.

⁷ Regarding the rationale behind the choices of tax redistribution, tax rates, and audit probabilities, we shall recall that, similar to other laboratory experiments analyzing the role of culture in tax compliance (e.g., Zhang et al., 2016; Guerra & Harrington, 2018; Ottone et al., 2018; D'Attoma, 2019), our *main* objective is not to evaluate the mere effects of treatments on tax compliance (which we anyway report in the interest of completeness), but to analyze whether treatment effects differ between locations. That is, how individuals from different locations (here, Italian regions) react to the *same* institutional scenario, and to the *same variations* in those institutional scenarios. The methodological key to achieve this purpose is to keep both the characteristics and the order of treatments constant across the Bologna and Salerno settings.

⁸ As also pointed out by Andrighetto et al. (2016), Zhang et al. (2016), Guerra & Harrington (2018), randomizing the order of the different rounds is not strictly necessary for the main purpose of this research, that is analyzing how individuals from different regions respond to the same institutional scenario. For this purpose, the potential ordering effect should remain constant across the culture vector. This explains why the sequence of tax scenarios is kept constant across the Bologna and Salerno settings. That said, we have anyway tested for the presence of order effects by comparing tax compliance rates in Round 2 versus Round 7—which share the same tax system parameters (Fig. A1). A set of Kruskal–Wallis “K–W” rank tests and t-tests, either pooled across samples or separated by sample, reveals no statistically significant differences at $p < .05$ in tax compliance rates between R2 versus R7. Specifically: for the Bologna sample, the tax compliance rate was 62.206% in R2 versus 58.738% in R7 (t-test $p = .563$; K–W $p = .444$); for the Salerno sample, 75.754% in R2 versus 66.789% in R7 (t-test $p = .074$; K–W $p = .054$); for the pooled sample, 69.226% in R2 versus 62.910% in R7 (t-test $p = .106$; K–W $p = .060$).

⁹ In our design, the amount that is collected from taxation is redistributed to participants (except in Round 1). This is sometimes referred to as “exchange equity,” in that subjects may perceive the act of paying taxes as the “price” to be paid for public goods provisions or services. See, among others, Alm et al. (1993); Moser et al. (1995); Cuccia & Carnes (2001); Kim (2002); Torgler (2002).

Fig. 1 Compliance rates by round and location



z-Tree (Fischbacher, 2007). Each session lasted about 90 min, and each subject participated only once. Participants earned an average of €10.64 at BLESS and €11.24 at LABESS. An English translation of the instructions to participants and the screenshots of the clerical task and reporting stage are available in the supplementary material.

3 Results

Average compliance rate (ratio of income reported to income earned) was 71.89%, significantly lower in Bologna than in Salerno (66.95% versus 76.48%; Kruskal–Wallis K-W test $p < .001$). In both locations, compliance rates varied predictably with tax conditions (Fig. 1).

In Bologna, compliance increased significantly with redistribution and audit rates, and decreased with the tax rates—except when tax rates increased from 30 to 50% (0.571 versus 0.529; t-test $p = .230$). We observed similar trends in Salerno, with significant variations in three cases: from no redistribution to redistribution (0.658 versus 0.757; t-test $p = .005$); from 5 to 30% tax rate (0.781 versus 0.695; t-test $p = .011$); from 5 to 30% audit probability (0.668 versus 0.920; t-test $p < .001$).¹⁰

More importantly for the main purpose of this research, a set of Kruskal–Wallis “K-W” tests—reported in Table A2 in the supplementary material—shows that by holding treatment constant, average tax compliance did *not* vary significantly between regions, except in four treatments wherein tax compliance was significantly higher in Salerno than in Bologna: no redistribution ($p = .008$); redistribution ($p = .034$); tax rate 30% ($p = .054$); tax rate 50% ($p = .057$). While those non-parametric comparisons provide an overview, they do not account for unbalanced characteristics between pools (see Table A1 in the supplementary material); thus, we conducted the regressions below.

¹⁰ These results can be explained by the fact that the change in tax rate from 30 to 50% could have been perceived as less salient than the greater change from 5 to 30%.

Following standard econometric analyses of tax compliance (see Alm & Malézieux, 2020, for a review), we distinguish between the extensive and intensive margins. We estimate double-hurdle (DH) models (Engel & Moffatt, 2014). The 1st hurdle (extensive margin) is specified as a 0/1 variable for compliance. The 2nd hurdle (intensive margin) is specified as the compliance rate, conditional upon compliance. Table 1 reports DH estimates by location. Subjects in Bologna reacted to all the treatments at $p < .01$ at both margins; the audit effect was strongest in magnitude, especially at the extensive margin (Col. I). Subjects in Salerno reacted to audits at $p < .01$ at both margins (Col. III), to tax rates at $p < .05$ at the intensive margin (Col. III, 2nd H); to redistribution at $p < .05$ at the extensive margin (Col. III, 1st H). Results hold when adding controls (Cols. II, IV). For the full specification of each control variable, see Table A3.

For the main objective of this research—that is, to investigate whether tax compliance and responsiveness to treatments differed between locations—we estimated DH models with the dummy *Salerno* and its interaction with treatment dummies as main covariates (Table 2). All specifications include controls; specifications in Cols. III–IV add interactions between *Salerno* and each control to account for unbalanced characteristics between pools. We refer to Table A4 for the full specification of each control variable and interaction.

Cols. I and III show DH estimates of the effect of *Salerno* on average compliance, pooling across treatments. The key covariate, *Salerno*, is positive and significant in Col. I, in line with the non-parametric comparisons. However, in Col. III, where the subjects' unbalanced characteristics between locations are thoroughly controlled for, the effect of *Salerno* is no more significant.

The DH estimates in Cols. II and IV show whether treatment effects on tax compliance differ between locations. The results reveal that subjects in Bologna and Salerno reacted to treatments *similarly*. By controlling for unbalanced characteristics (Col. IV), the interactions between *Salerno* and treatment dummies are not significant, except for *Salerno#Redistribution* in the 2nd hurdle (negative and significant at $p < .05$). This indicates that subjects in Salerno reacted less than those in Bologna to variation in redistribution.

As a final remark, it is worth mentioning that among our 220 subjects, 106 (48.18%) were recruited in Bologna (of which 44 (41.51%) were born in northern Italy, eight (7.55%) in central Italy, 54 (50.94%) in southern Italy) and 114 (51.82%) were recruited in Salerno (all born in the south except for one participant born in the north). While the Salerno sample is clearly representative of the south, one might raise the question of whether the Bologna sample is representative of the north of Italy. We have checked whether the comparison between the “Bologna sample” versus the “Salerno sample” is a valid representation of regional differences within Italy by conducting two robustness checks (available in the supplementary material). In the first check, we compared the sample within the subjects recruited in Bologna and born in the north ($N=44$) to a random sample of the same size within the subjects recruited in Salerno and born in the south. See Tables A5 and A6. In the second check, we only considered the sample of participants recruited in Bologna and compared those born in the north ($N=44$) to those born in the south ($N=54$). See Tables A7 and A8. Our main results hold.

Table 1 Effects of treatments on tax compliance by locations

DV: Compliance Rate	Bologna				Salerno			
	(I)		(II)		(III)		(IV)	
	1st H	2nd H	1st H	2nd H	1st H	2nd H	1st H	2nd H
Tax Rate	-0.942** (0.427)	-0.239*** (0.092)	-1.213** (0.482)	-0.254*** (0.091)	-0.605 (0.457)	-0.152** (0.073)	-0.688 (0.483)	-0.153** (0.071)
Audit	1.923*** (0.382)	0.357*** (0.060)	2.467*** (0.450)	0.366*** (0.060)	3.009*** (0.614)	0.271*** (0.048)	3.314*** (0.642)	0.282*** (0.048)
Redistribution	0.290*** (0.096)	0.083*** (0.021)	0.392*** (0.111)	0.085*** (0.020)	0.240** (0.101)	0.022 (0.017)	0.281** (0.109)	0.024 (0.016)
Constant	0.598*** (0.169)	0.781*** (0.036)	-0.012 (0.348)	0.822*** (0.065)	0.824*** (0.181)	0.858*** (0.029)	0.585 (0.370)	0.833*** (0.052)
Controls	NO	NO	YES	YES	NO	NO	YES	YES
σ_u		0.264*** (0.007)		0.259*** (0.007)		0.231*** (0.005)		0.224*** (0.005)
χ^2	54.98		89.78		36.26			99.39
Log likelihood	-530		-408		-319			-250
Observations	954		954		1026			1026

Notes: Double-hurdle regression models with robust standard errors reported in parentheses. The dependent variable ("DV") is Compliance Rate, defined as the ratio of income reported to income earned. Abbreviations: "H" stands for Hurdle. See Table A3 in the supplementary material for the full specification of each control variable. * $p < .10$ ** $p < .05$ *** $p < .01$

Table 2 Effects of treatments on tax compliance between locations

	(I)		(II)		(III)		(IV)	
	1st H	2nd H	1st H	2nd H	1st H	2nd H	1st H	2nd H
Salerno	0.533*** (0.082)	0.043*** (0.014)	-1.529*** (0.401)	-0.345*** (0.072)	0.658 (0.426)	-0.032 (0.072)	-1.373*** (0.463)	-0.255*** (0.080)
Tax Rate								
Audit			2.244*** (0.420)	0.353*** (0.054)			2.439*** (0.444)	0.365*** (0.055)
Redistribution			0.299*** (0.099)	0.069*** (0.017)			0.367*** (0.108)	0.084*** (0.018)
Salerno#Tax Rate			1.264*** (0.449)	0.270*** (0.080)			0.846 (0.626)	0.105 (0.104)
Salerno#Audit			1.360* (0.771)	-0.058 (0.073)			0.919 (0.788)	-0.083 (0.076)
Salerno#Redistribution			0.055 (0.129)	-0.031 (0.021)			-0.061 (0.149)	-0.060** (0.024)
Constant	0.319 (0.209)	0.809*** (0.036)	0.392 (0.248)	0.818*** (0.041)	0.135 (0.289)	0.858*** (0.052)	0.266 (0.253)	0.828*** (0.041)
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Salerno#Controls	NO	NO	NO	NO	YES	YES	YES	YES
σ_u		0.249*** (0.004)		0.242*** (0.004)		0.248*** (0.004)		0.240*** (0.004)
χ^2	68.82		171.95		86.74		195.11	
Log likelihood	-795		-694		-771		-667	
Observations	1980		1980		1980		1980	

Notes: Double-hurdle regression models with robust standard errors reported in parentheses. The dependent variable (“DV”) is Compliance Rate, defined as the ratio of income reported to income earned. Abbreviations: “H” stands for Hurdle. See Table A4 in the supplementary material for the full specification of each control variable and interaction. * $p < .10$ ** $p < .05$ *** $p < .01$

4 Conclusions

Although the cultural account of tax compliance has frequently been applied to the Italian case (Ottone et al., 2018; D’Attoma, 2019), we find that under laboratory conditions *ceteris paribus*, northerners and southerners generally behave alike as taxpayers. The only exception to this pattern is fairly minor: subjects from Salerno were less responsive than their counterparts from Bologna to increases in redistribution of tax revenues.¹¹

Our results align with recent work suggesting that institutional differences—such as enforcement capacity; redistribution policies—may drive many national and regional tax compliance variations observed in the real world, and join a stream of work noting limitations in the explanatory power of culture in tax compliance (Lefebvre et al., 2015; Andrighetto et al., 2016; Zhang et al., 2016; D’Attoma, 2017, 2019, 2020; Guerra & Harrington, 2018; Ottone et al., 2018; Pampel et al., 2019). Distinct from prior contributions analyzing North-South differences in tax compliance (D’Attoma, 2017, 2019), our results draw attention to one aspect of compliance thus far underexplored: individuals’ sensitivity to changes in tax systems within a country. Here we cannot tease out what is driving the weaker response of southerners to redistribution effects than northerners; yet a plausible explanation is the divergent regional experiences of state institutions. Indeed, other studies suggest that southerners have lower trust in and expectations of the state, and this could affect their responsiveness to redistribution (Huyseune, 2003; Foschi & Lauriola, 2016; Arvanitidis et al., 2020; D’Agostino et al., 2021). This aspect deserves further exploration in future research.

Finally, in answering calls to investigate the neglected area of within-country variation (Brosio et al., 2002; Barone and Mocetti, 2011; Torgler, 2016), we have provided fine-grained insight at a level of analysis usually elided in cross-national studies. Future research should continue to put regional differences to rigorous tests. In particular, we hope our results will inspire replication efforts involving other regions. Additionally, future research could compare the effectiveness of centralized versus decentralized tax schemes in fostering individuals’ tax compliance (Bird, 1966; Güth et al., 2005; Torgler et al., 2010)—especially in the many countries where regional differences are pronounced, such as Switzerland, the US, and China (Li et al., 2020).

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s40888-022-00281-9>.

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Authors’ contributions The authors equally contributed to the current study.

¹¹ This result may be read in conjunction with D’Agostino et al.’s (2021) empirical evidence, showing that in the southern provinces of Italy, citizens’ willingness to pay taxes is not statistically affected by an increase in redistributive public spending.

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Availability of data and material The data and material used and analyzed during the current study are available upon request.

Code availability The code used to conduct the experiment and to analyze the data is available upon request.

Declarations

Conflicts of interest/competing interests The authors declare that they have no competing interests.

Ethical approval Not requested to conduct the current study.

Consent to participate Informed consent was obtained from all individual participants included in the study.

Consent to publication Not applicable.

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