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## Gender, Social Value Orientation, and Tax Compliance

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# Gender, Social Value Orientation, and Tax Compliance

## Abstract

This paper brings an important empirical contribution to the academic literature by examining whether gender differences in tax compliance are due to higher prosociality among women. We conducted a large cross-national tax compliance experiment carried out in Italy, U.K., U.S., Sweden, and Romania, and assessed tax compliance as reported income as a percentage of total earned income in the experiment. We uncover that women declare a significantly higher percentage of their income than men in all five countries. While some scholars have argued that differences in honesty between men and women is actually being mediated by the fact that women are more prosocial than men, we find that women are not more prosocial than men in all countries. Furthermore, though overall women tend to be more prosocial on average than men, SVO has no mediation effect between gender and tax compliance. We conclude then that although differences in prosociality between men and women seem to be context dependent, differences in tax compliance are indeed much more consistent.

JEL-Codes: A100, C900, C920, D640, H260, H300, H410.

Keywords: behavioral economics, tax compliance, gender.

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## 1. Introduction

As countries face a number of challenges that have consequently led to controversial budget cuts, it is essential that governments can increase revenue without necessarily increasing tax rates, such as increasing tax compliance. As Sven Steinmo (1993, 1) puts it, “Governments need money. Modern governments need lots of money.” Unfortunately, governments lose a considerable amount of money due to tax avoidance and evasion— for example, the Tax Justice Network estimates that the world economy loses approximately \$3.1 trillion from tax evasion (Werdigier 2016). It is thus useful to understand both when, why, and which people would choose to pay their taxes honestly and how to elicit voluntary compliance. In this paper, we explore tax behavior employing a large tax compliance experiment conducted in five countries. We ask the following research questions: First, are prosocial individuals more tax compliant? Secondly, are women more tax compliant than men? Finally, does Social Value Orientation (SVO) mediate the effect of gender on tax compliance?

In a recent study by Kerstin Grosch and Holger Rau (2017) the authors confirm research that suggests women are more honest than men. They not only show, however that *women are more honest than men*, but that *women’s more honest behaviour is being mediated by the fact that they are more prosocial*. Our contribution extends upon these results by examining a specific policy domain: tax compliance.

Although there is large body of experimental literature on gender, tax compliance, and Social Value Orientation (SVO), we have yet to come across a study that links these three variables. We, therefore, add a theoretical contribution to the tax compliance literature. Moreover, individual behavior is embedded with a large set of psychological motivations informed by the set of norms and beliefs in which the cognitive system was developed. We argue that institutions are one of the main drivers of the individual’s framing system and it is important to test behavior in different contexts. We thus also add to the literature by examining if there are effects across countries.

To preview our results: We find that SVO is an important aspect of the tax compliance decision, and women are also more tax compliant than men (in all countries) – confirming a large body of tax compliance literature. However, differences in SVO vary by gender only in some countries, meaning that women are not more prosocial than men in all countries. As such, we suggest that pro-social values might be context dependent, while gender differences in tax compliance are much more consistent across countries.

## 2. Literature Review

### Social Value Orientation

The social value orientation (SVO) scale has been a frequently employed metric in experimental studies. It is an expressive metric of how much people care for others’ wellbeing. We used for the present study the continuous version developed by Ryan Murphy and his colleagues (Murphy et al 2011). Ryan Murphy and Kurt Ackermann regard social value orientation (SVO) as the “predominant conceptualization of social preferences in psychology” (2014:13). As opposed to previous categorical versions of the SVO, this newer version allows us to have a more detailed assessment of individual differences. Prosocial subjects tend to be more reactive to social norms of cooperation than self-interest maximization. As audit rates and penalties have been proven to be

insufficient in deterring tax evasion (Graetz and Wilde 1985, Frey and Feld 2002), our goal in using SVO measurement is to assess the extent to which a person's social-value orientation can help explain their fiscal compliance (or lack of).

SVO has also been analyzed in relation to trust and reciprocity (Kanagaretnam et al 2009), cooperation (see meta-analysis from Balliet et al 2009), and expectations (Pletzer et al 2018). This entices us to look for the effects of pro-sociality on cooperative behavior in a fiscal setting. While there are notable studies on the effects of tax morale on tax compliance (Alm and Torgler 2006; Torgler 2007), much fewer have concerned the impact of SVO. In fact, we have yet to come across a study that examines SVO as it relates to tax compliance. If SVO influences cooperation and public goods contributions, we would also expect SVO to impact an individual's willingness to pay taxes.

### **Gender**

There is quite a large catalogue of literature that examines the effects of gender on honesty. Studies are at odds, however, on this issue. The majority of honesty games suggest that women are more prone to honest behavior (Erat and Gneezy 2012, Capraro 2018). Still, there are also those that challenge gender differences. Biziou-van-Pol et al (2015) have questioned this assumption, suggesting that the debate on gender differences in lying is not settled. Most recently, however, Grosh and Rau (2017) have confirmed gender differences, as they find men are less honest than women in a deception game (i.e. cheat significantly more), and they link these gender differences to social value orientation (SVO) (i.e. consideration of others).

Tax compliance experiments overwhelmingly demonstrate gender differences (Hasseldine and Hite 2003; Chung and Trivedi 2003; Gërxhani 2007; Gylfason, Arnardottir, and Kristinsson 2013; Bruner, D'Attoma, and Steinmo 2017; D'Attoma, Volintiru, and Steinmo 2017). These studies all find that women are more tax compliant than men in most countries in laboratory environments. For example, D'Attoma et al (2017) examining differences between men and women in the U.S., Sweden, U.K., and Italy, assert that women are less likely than men to cheat on taxes, across countries and across cultures. However, in another study using the same data, Bruner et al. (2017) uncover that although women are more compliant than men, men are more responsive to an increase in the pay-off from a public good.

### **3. Hypotheses**

Tax compliance is a decision that is embedded with a host of personal and psychological motivations as well as consideration for institutional constraints and context, such as the pay-off from the public good, risk, or tax rates. To the extent that tax compliance is not just a calculation of perceived risks and benefits, tax compliance is an inherently prosocial decision (Alm et al 2012, Brizi et al 2015, Drus 2016). When paying taxes, taxpayers contribute some of their earnings to a government, who then takes that money to provide public goods. Therefore, people who derive higher utility by making others better off, would also be more likely to contribute their earnings in the form of tax payments (Erard and Feinstein 1994, Dunn et al 2014). Similarly, a more individualistic person who is more concerned with maximizing their own payoff will more likely evade their fiscal obligations.

Hypt1: Individuals with higher SVOs will report significantly more of their earnings in all countries.

Carol Gilligan (1982) suggests that men and women's divergent behavior can be compartmentalized into two theoretical constructs. Instrumentalism better represents masculine behavior and stresses the role of hierarchical relationships, individual rights, competition, and equates morality with justice. Females demonstrate more contextualist behaviors by emphasizing communal relationships, cooperation, and avoidance of harm to others. There is an extensive body of experimental literature addressing behavioral differences between men and women in altruistic preferences and willingness to contribute to the public good. Catherine C. Eckel and Phillip J. Grossman have consistently demonstrated that women are the fairer sex and more altruistic. In an ultimatum game, Eckel and Grossman (2001) demonstrate that women are not only more cooperative, but in addition, offers from women are significantly more likely to be accepted. Because women are more cooperative they were more willing to accept unequal splits. In a similar line of research in which one partner is the sender and the other is the receiver, men tend to send more money, especially when women are on the receiving end of the partnership, but women return more money to the sender (Buchan et al. 2008). This again speaks to the contextual/instrumental behaviors of men and women. According to Buchan et al. (2008, 7), "the only possible motivation to be trustworthy is a communal one (an empathetic response, perhaps the need to live up to expectations)." Thus, whether the task is instrumental or contextual will influence the choices that males and females will make.

Hypt2: (a) On average women are more prosocial than men in all countries.

(b) On average women will report more income than men.

Extending upon Grosh and Rau (2017), we suggest that this relationship between SVO, gender, and honesty should be applicable to tax compliance as well. If it is the case that women are more prosocial than men, those prosocial preference could be meditating their tax compliance decision.

Hypt3: The individual SVO mediates the effect of gender on dishonest behavior.

#### **4. Experimental Design**

Our experiments were conducted over the course of two years (2015-2017) in different sites across Europe and America<sup>\*\*</sup>. Our experimental design follows the basic elements of most tax compliance experiments: through clerical tasks subjects earn experimental currency units, which are exchanged for real money at the exchange rate of .01 per token, and are subsequently asked to report their income. The extent to which subjects declare their earnings allows us to create a compliance rate for each individual in each round. Reported income was subject to a random audit of 5%, and if audited, underreported income was subject to a fine of twice the taxes owed. Final income was equal to the earned income plus the redistributed revenues from collective choices of contribution, less taxes levied and fines.<sup>††</sup>

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<sup>\*\*</sup> The experimental sites included Bologna Laboratory for Experiments in Social Sciences, Centro d'Economia Sperimentale A Roma Est, and Experimental Economics Lab of the University of Milano Bicocca in Italy, Oxford Experimental Laboratory, Experimental Economics Laboratory-Royal Holloway in London, Finance and Economics Experimental Laboratory at Exeter, and ESSEXLab at Essex in Britain, Learning & Experimental Economics Projects at University of California-Santa Cruz, Social Science Experiments Lab at University of Colorado-Boulder, Appalachian Experimental Economics Laboratory in Boone, North Carolina, Center for Behavioral Political Economy in Stony Brook, New York, and University of Hawaii Laboratory for Computer-Mediated Experiments and the Study of Culture in Honolulu, Hawaii, in the US, and the Behavioural lab in Stockholm and Behavioural and Experimental Economics in Gothenburg in Sweden, Bucharest University of Economic Studies (ASE) and National School of Political Science and Public Administration (SNSPA) in Bucharest, and Babes-Bolyai University in Cluj in Romania.

<sup>††</sup> Another paper from this study using the same design can be found in D'Attoma 2018.

The experimental design consisted of a total of six reporting rounds separated in two stages. In the first stage of the experiment we manipulate the payoff to the public good while in the second round we vary the public institution to which subjects contribute. Subjects were informed of the payoff they would receive from their contribution to the public good, a 5% chance of being audited, and the penalty and fine for underreporting. In round 1, there was no payoff from the public good. Essentially the money was burned. In round 2, their money was collected, summed, and put into a general fund which was then redistributed equally to all participants. Finally, in round 3, the money was collected into a general fund divided into two portions: one part (80%) was allocated to portion A, and a second part (20%) was allocated to portion B. All of the money in portion A was distributed in equal parts to all of the participants, regardless of how much each participant earned, and how much they put into the fund. The money in portion B was distributed in equal parts to the lowest 20% of income earners, regardless of how much each person in this group put into the fund. For stage two of the experiment we maintained a tax rate of 30%. However, in this stage, subjects were asked to perform a four-minute clerical task before each reporting round, for which they would earn money and pay taxes directly to their real-world institutions. Therefore, there was not an abstract public good, but instead, there was an actual public good attached to this stage, since we did send all revenues to the public institutions (i.e. national government, pension fund, fire department) at the end of the experiment.

Once the tax compliance part of the experiment was completed, subjects took part in a Social Value Orientation task designed by Murphy and Ackerman (2011). After the income reporting rounds, subjects were tasked with 6 allocation decisions to elicit their ‘social value orientation’ (Murphy et. al., 2011). The decision was a simple allocation task. Individuals were required to choose a proportion of coins to be shared between them and a randomly chosen anonymous partner (See Table 2 for an example of the first six decisions). These decisions are created to gauge the extent to which a subject cares about another subjects earnings relative to their own.##

**Table 2: Social Value Orientation Allocation Decisions**

Decision	1	2	3	4	5	6
1	(85 , 85)	(85 , 76)	(85 , 68)	(85 , 59)	(85 , 50)	(85 , 41)
2	(85 , 15)	(87 , 19)	(89 , 24)	(91 , 28)	(93 , 33)	(94 , 37)
3	(50 , 100)	(54 , 98)	(59 , 96)	(63 , 94)	(68 , 93)	(72 , 91)
4	(50 , 100)	(54 , 89)	(59 , 79)	(63 , 68)	(68 , 58)	(72 , 47)
5	(100 , 50)	(94 , 56)	(88 , 63)	(81 , 69)	(75 , 75)	(69 , 81)
6	(100 , 50)	(98 , 54)	(96 , 59)	(94 , 63)	(93 , 68)	(91 , 72)

*Table Notes:* In each allocation, the first value is the number of tokens the decision-maker keeps for themselves and the second value is the number of tokens the other person receives.

We construct the SVO angle as such: First, we calculate the average number of tokens a participant keeps to their self,  $y_1$ , and the average number of tokens they give

## The last nine decisions determined whether prosocial behavior was driven by inequality aversion or joint gain maximization. Since the motivation for prosocial behavior is not relevant for this research question, these decisions are omitted from Table 2 and the subsequent analysis.



to the other participant,  $y_2$ . Then we subtracted 50 from each in order to shift the coordinates. Finally, we take the arctangent of the ratio of the corrected allocation to the other participant relative to oneself to calculate the SVO angle,

$$SVO^\circ = \arctan \frac{(y_2 - 50)}{(y_1 - 50)}.$$

At the end of the experimental rounds, subjects were asked to take a short 10-minute survey that collected demographic information, as well as information regarding trust attitudes towards taxation, and levels of risk tolerance.

Subjects were recruited through a common recruitment system called Online Recruitment System for Experimental Economics (ORSEE) (Greiner 2004), and the experiments were programmed in Behavery. Sessions lasted approximately 60 minutes. Payment structure was based on 1.5 times the country's minimum wage. In total we had 1,124 subjects of which 55% were men and 45% were women. The average age was 22, and 61% of our sample had previously partaken in behavioral experiments. Finally, the average earnings were approximately \$13 dollars with a 5\$ show up fee.

## 5. Results

**Result 1:** SVO is positively correlated with the average compliance rate over all.

Here we test the effects of Social Value Orientation on tax compliance. From Figure 1, we can observe a bimodal distribution, which is typical of a tax compliance experiment. This means that we get a large number of respondents either reporting 0 income or all income. Interestingly, the number of people who report 100% of their income far surpasses the number of individuals who report 0, although reporting 0 is the optimal decision in each round.

Now we move on to examine the relationship between SVO and reporting behavior. We do this first by using our pooled data set, followed by investigating the relationship in each individual country. The scatter plot in Figure 2 demonstrates that there is strong positive correlation between SVO angle and the average compliance rate. A Spearman's Rho of  $\rho=0.30$  ( $p=0.000$ ) demonstrates a strong statistically significant relationship between the two variables. Specifically, individuals with higher SVO angles report significantly higher proportions of their income than individuals with lower SVOs.

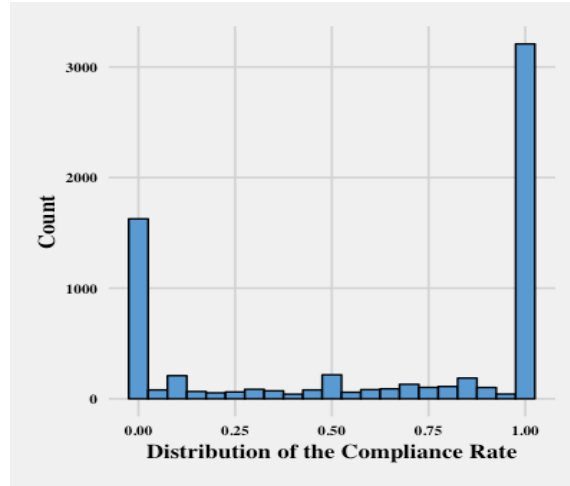


Figure 1: Distribution of Tax Compliance

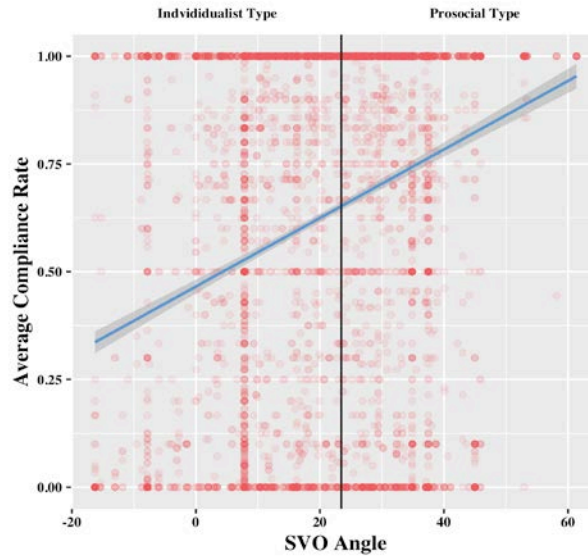


Figure 2: Effects of SVO on Tax Compliance

This confirms previous literature on the effects of SVO on honest behavior. However, we are also interested in whether this relationship holds up when testing it in a number of countries.

To do this, we run Spearman's correlation coefficient in each individual country. We confirm that SVO is significantly and positively correlated with tax compliance in each country.<sup>§§</sup>

**Result 2:** Women are significantly more tax compliant than men overall and in each individual country; however, whether women are more prosocial depends on the country in which the experiment was conducted.

In this section, we test whether women are more tax compliant and prosocial than men. From the bar graph in Figure 3, we can clearly see that women are more tax compliant

<sup>§§</sup> Italy:  $\rho = 0.24$  ( $p=0.000$ ), the U.K.:  $\rho = 0.26$  ( $p=0.000$ ), the U.S.:  $\rho = 0.33$  ( $p=0.000$ ), Sweden:  $\rho = 0.25$  ( $p=0.000$ ), and Romania:  $\rho = 0.15$  ( $p=0.000$ )

then men in each country. Women on average, across countries report an astounding 73% of their income, while men report approximately 48% of their income. We also perform a Mann-Whitney test for our pooled sample and within countries. Our test confirms the figure demonstrating that women are significantly more compliant than men across (Mann-Whitney test:  $p = 0.00$ ) and within countries.\*\*\*

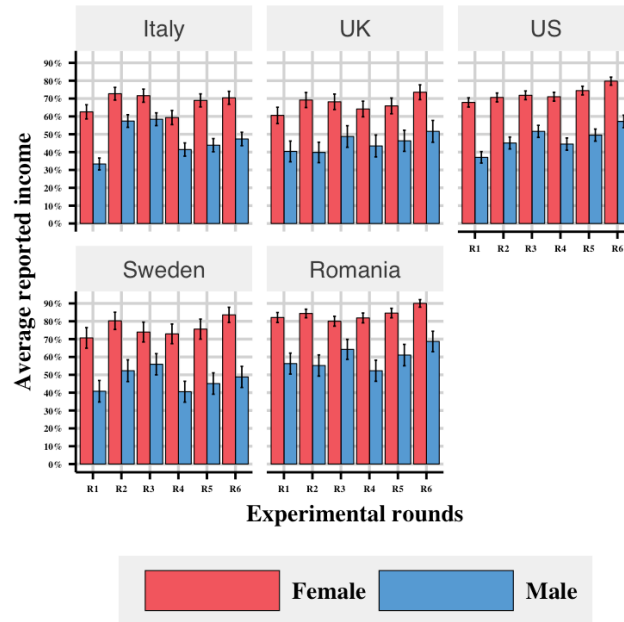


Figure 3: Bar Chart of Tax Compliance by Gender and Country

We also explore the relationship between gender, SVO, and tax compliance. As such, we examine differences in the SVO angle between men in women overall and within countries. Figure 4 are Cumulative Distribution Functions (CDF) for men and women for each individual country.

\*\*\* Mann-Whitney test: Italy: ( $p=0.000$ ), the U.K.: ( $p=0.000$ ), the U.S.: ( $p=0.000$ ), Sweden: ( $p=0.000$ ), and Romania: ( $p=0.000$ )

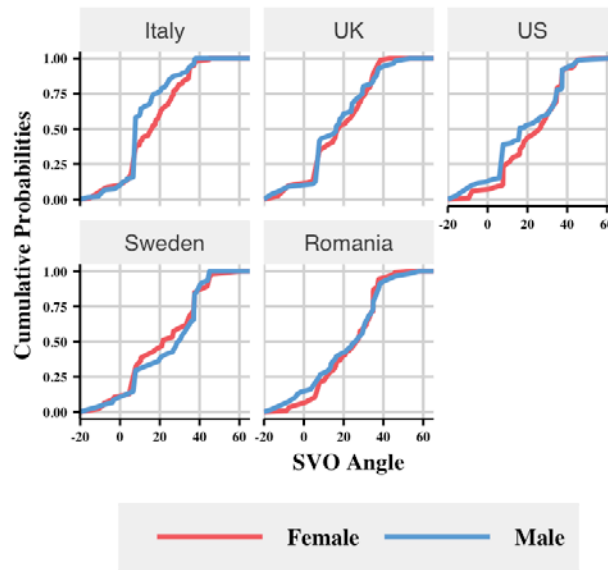


Figure 4: Cumulative Distributions for the Compliance Rate

We find that overall there seem to be significant differences between men and women with regard to SVO (Mann-Whitney:  $p = 0.00$ ). Indeed, women have an average SVO angle of 21, whereas men have an average SVO angle of 18. However, somewhat surprisingly, we uncover that women are only more prosocial than men in Italy and the United States Mann-Whitney test: Italy: ( $p=0.000$ ), the U.K.: ( $p=0.20$ ), the U.S.: ( $p=0.000$ ), Sweden: ( $p= 0.19$ ), and Romania: ( $p= 0.71$ ).

Though we cannot begin to speculate as to why women are more prosocial in some countries but not others, this result would suggest that differences between men in women with regard to prosociality are largely context dependent.

Table 1: Descriptive Statistics

## Mediation Analysis

Finally, we examine whether SVO mediates the effect of gender on tax compliance. First from Table 1, we can see that there are significant differences between men and women in their levels of self-reported risk aversion, as well men are much more likely to study economics.

Table 1 in the Appendix reproduces the original table from Grosch and Rau (2017). On the left hand-side column, we run OLS regressions examining the effects of gender on the compliance rate. Using the SEM command in Stata 15 allowed us to compute

	WOMEN (N=3,720)		MEN (N=3,024)		FULL SAMPLE (N=6,744)	
	Mean	STD. DEV.	MEAN	STD. DEV.	MEAN	STD. DEV.
<b>Compliance Rate (%)</b>	0.73	0.38	0.48	0.45	0.62	0.43
<b>Risk</b>	5.79	2.31	6.38	2.34	6.06	2.34
<b>Econ major (%)</b>	0.28	0.45	0.40	0.49	0.33	0.47
<b>Past-participation</b>	0.61	0.49	0.61	0.49	0.61	0.49
<b>Age</b>	21.85	5.57	22.27	5.54	22.04	5.56

possible mediating effects in columns 2, 3, 4 and 5. We also include control variables such as the self-declared risk tolerance, subject's age, economics majors, and the different country dummies for the countries in which the experiment was run.

Figure 4, demonstrates the Structural Equation Model. In panel A, the female subject variable is a significant predictor of tax compliance. Including the potential mediator (SVO angle) in the path model (panel B, in black), we observe almost no changes to the effect of being a female on tax compliance. The coefficient on the SVO variable means that being female increases tax compliance by 23% points, all else being equal. Moreover, the impact of being female on SVO disappears ( $p = 0.206$ ) when control variables are considered (in grey).

To sum up, contrary to what we had expected based on Grosch and Rau, the impact of gender on tax compliance is not mediated by subjects' SVO. Instead, females are more tax compliant than men in every round and every country, even while controlling for a number of variables.

**Result 3:** SVO does not mediate the effects of gender on tax compliance. Indeed, our mediation analysis demonstrates that the effects of gender on tax compliance barely budge when introducing the mediator.

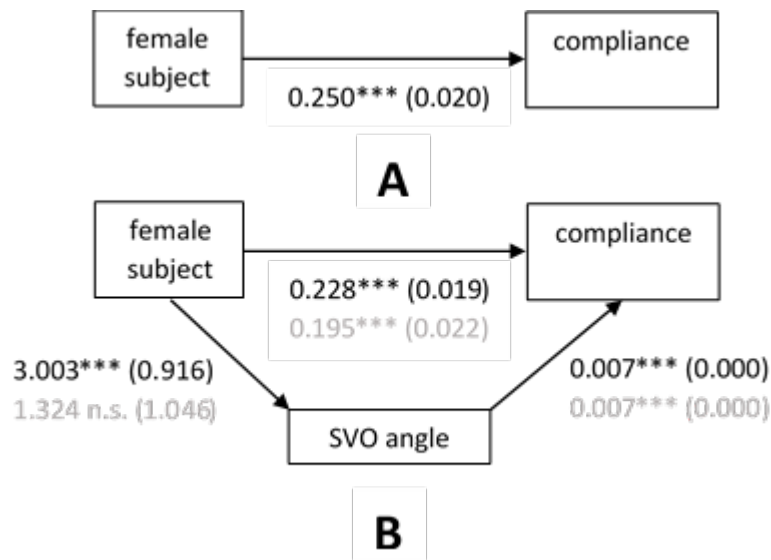


Figure 5. Schematic diagram of mediation analysis results. Path values are reported coefficients with standard errors in parentheses. Data in grey color represent results when covariates (risk tolerance, age, economics background, country) are considered.

Significance levels: \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

## 6. Concluding Remarks

In this paper, we tested the extent to which SVO mediates the effect of gender on tax compliance. We confirm much of the prior research on honesty and tax compliance. Namely that women are more honest and tax compliant than men across a large sample of countries and institutional contexts. Though many studies have examined the role of SVO on social dilemma games, this is the first to examine its effect on tax compliance. We uncover that prosocial individuals are more tax compliant, and that levels of prosociality vary by gender in some countries, but not all. Finally, we examine whether SVO mediates the effect of gender on tax compliance, and conclude that women are more tax compliant despite being more prosocial.

This paper makes three important contributions to the existing literature. First, we further explore and confirm gender-based behavioral differences with regard to tax compliance across a wide number of countries, regions, and institutional settings. Moreover, we extend previous literature by controlling for ones' social values, determining that *despite* differences in SVO overall, there are still large gender differences in tax compliance. Secondly, we extend upon the SVO literature by demonstrating that though SVO varies by gender in some country, it does not vary by gender in all countries. Prosociality is an important feature of most decisions that require cooperation, and thus exploring what determines SVO and why it varies between genders in some countries, but not others, should be studied further. Finally, the extent and scope of our study make this one of the largest and most comprehensive tax compliance experiments to date, coupled with an SVO task.

To conclude, our findings make three important contributions to the literature; however, our study still does not provide a definitive answer or shut the door on this important debate with regard to gender differences in tax compliance. From our research, along with many other studies mentioned in the literature review, it seems

clear that there are large gender differences in willingness to pay taxes. But, unfortunately, the literature doesn't seem to provide answer to why this may be. Grosch and Rau (2017) suggest that gender differences in honesty are at least somewhat due to higher levels of prosociality in women. Though tax compliance is related to honesty, it encompasses a number of other motivations as well, such as cooperation, and therefore, it is not exactly the same. Indeed, we find that prosociality has very little mediating influence on the effects of gender on tax compliance. Therefore, further research should explore this interesting puzzle: Why are women so tax compliant?

## Appendix

Table 1

Mediation analysis with Structural Equation Modeling.

	<i>Compliance</i> OLS (1)	<i>Compliance</i> SEM (2)	<i>SVO angle</i> SEM (3)	<i>Compliance</i> SEM (4)	<i>SVO angle</i> SEM (5)
<i>Female</i>	.250*** (.020)	.195*** (.022)	1.324 (1.046)	.228*** (.019)	3.003*** (.916)
<i>SVO</i>		.007*** (.000)		.007*** (.000)	
<i>Risk</i>		-.021*** (.004)	-.851*** (.236)		
<i>Age</i>		.000 (.003)	.012 (.140)		
<i>Econ</i>		-.059** (.025)	-4.318*** (1.113)		
<i>UK</i>		-.036 (.047)	1.192 (2.010)		
<i>US</i>		-.037 (.028)	6.435*** (1.270)		
<i>Sweden</i>		-.117*** (.044)	5.077** (2.140)		
<i>Romania</i>		.132*** (.037)	8.703*** (1.900)		
<i>Constant</i>	.483*** (.016)	.536*** (.081)	17.766*** (3.817)	.353*** (.019)	18.020*** (.702)
<i>Var</i> <i>(Compliance)</i>		.160 (.004)		.159 (.003)	
<i>Obs.</i>	6,712	5,005	5,005	6,712	6,712
<i>R<sup>2</sup></i>	0.0830	-	-	-	-

Notes. Robust standard errors between parentheses. Italy has been omitted to avoid multicollinearity bias.

\* p < 0.1

\*\* p < 0.05

\*\*\* p < 0.01



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