Emotions and tax compliance among small business owners: An experimental survey

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ABSTRACT

Tax authorities' power to enforce compliance as well as taxpayers' trust in the tax agency shape taxpayers' compliance behavior. But while financial decisions often trigger strong emotional responses, little is known about the relation between taxpayers' emotions and their compliance choices. We hypothesize that emotions mediate the relationship between the perception of tax authorities and intended tax compliance. In a scenario-based experiment with 411 self-employed Turkish taxpayers, we find that highlighting authorities' enforcement capacity (i.e. high power) induces negative emotions while elevating enforced compliance and the readiness to evade. Trust, on the other hand, reduces negative emotions and raises positive feelings, which are associated with intentions to comply voluntarily. Moreover, a combination of high power and high trust reduces negative feelings and increases intentions to comply while undermining the readiness to evade. Our findings suggest that emotions matter in shaping compliance. Specifically, enforcement efforts that induce negative emotions might have negative compliance implications.

1. Introduction

Tax policies are usually discussed controversially in the media (e.g. Kasper et al., 2015) and often provoke emotional responses in taxpayers. But despite a comprehensive body of research on tax compliance behavior (e.g., Kirchler, 2007) and the link between financial decisions and emotions (Pessiglione et al., 2007), little is known about the role of emotions in tax compliance decisions. This paper investigates the effects of tax authorities' behavior on self-employed taxpayers' emotions. Moreover, we analyze whether emotions mediate the effect of tax authorities' actions on intended compliance behavior.

A broad range of disciplines explore the determinants of taxpayer behavior. Early research defines tax compliance as a decision under uncertainty which is determined by audit probabilities, fines for non-compliance, tax rates, and income levels (Allingham and Sandmo, 1972). Particularly self-employed taxpayers have opportunities to cheat and are prone to do so (Kleven et al., 2011).

However, as compliance levels are often higher than theoretically predicted (Alm et al., 1992), more recent research emphasizes the importance of psychological determinants of compliance behavior (e.g. Kirchler, 2007; Mittone, 2006).

Findings from economic and psychological perspectives have been integrated into the "slippery slope framework" of tax compliance (SSF) (Kirchler et al., 2008), which postulates that tax compliance can either be achieved through exercising power (coercion) or result from a trustworthy relationship between tax authorities and taxpayers. But while a substantial body of literature confirms the main assumptions of the SSF (e.g. Kogler et al., 2013; Kasper et al., 2015; Kogler et al., 2015), research on tax compliance behavior has not yet considered the emotional implications of power and trust, which likely affect motivations to comply. Yet, understanding the emotional processes that underlie tax compliance behavior is crucial in order to develop strategies that strengthen voluntary compliance. Deterrence measures, for instance, might undermine compliance if taxpayers perceive enforcement as arbitrary or unjustified (Mendoza et al., 2017; Beer et al., 2015). Investigating taxpayers' emotional responses to tax authorities' behavior thus adds to the understanding of the dynamics between trust, power, and tax compliance. This is particularly

relevant in the context of emerging economies such as Turkey where compliance levels are rather low (Riahi-Belkaoui, 2004) and small businesses account for a large share of the economy (OECD, 2004). Gaining a better understanding of the role of emotions in compliance behavior might thus facilitate the development of more efficient administrative strategies. Against this background, this paper aims to provide initial indication of the role of emotions in tax compliance behavior.

This paper proceeds as follows. The next sections discuss how motives (1.1) and emotions (1.2) affect tax compliance behavior and develops our hypotheses (1.3). Section 2 describes our method and empirical strategy. The third section presents our results. The fourth section discusses our findings and concludes.

1.1. Motives and tax compliance

Braithwaite (2003) established that different motivational postures drive tax compliance behavior. For instance, taxpayers comply because they fear punishment for non-compliance, or because they feel committed to society (James and Alley, 2002). Building on these insights, Kirchler (2007) developed the SSF and introduced *power* and *trust* as determinants of tax compliance (Kirchler et al., 2008). Deterrence measures such as audits and fines for non-compliance indicate a state's power and lead to enforced compliance. Socio-psychological factors, for instance fairness perceptions, social norms, attitudes towards taxes, and services provided by the authorities build trust and stimulate voluntary compliance. The SSF predicts high levels of tax compliance when trust and power are high. Conversely, when trust and power are low, compliance levels are low.

More recent work on the SSF used questionnaire techniques to investigate different facets of intended tax compliance. For instance, Kogler et al. (2013) used Likert-type survey questions to analyze the effects of trust and power on intended tax compliance, i.e., taxpayers' general willingness to pay taxes honestly. Wahl, Kastlunger, and Kirchler (2010) used questions on commitment and resistance to investigate the effects of trust and power on voluntary and enforced compliance, while other studies employed fictitious scenarios that describe specific opportunities to evade in order to assess intended tax evasion (Kirchler and Wahl, 2010). In line with prior work on the SSF, our study investigates (1) intended tax compliance, (2) voluntary tax compliance, (3) enforced tax compliance, and (4) intended tax evasion.

A growing body of evidence supports the assumptions of the SSF (e.g. Kirchler et al., 2008; Kogler et al., 2013; Kasper et al., 2015) and empirical studies suggest that compliance rates are highest when tax authorities are considered powerful and trustworthy (Kirchler et al., 2014). However, there is initial indication that enforcement activity might backfire (Mendoza et al., 2017) and crowd-out voluntary compliance (see Lederman (2018) for an overview). For instance, self-employed US taxpayers have been found to reduce their reporting compliance in response to tax audits that do not result in an additional tax assessment (Beer et al., 2015). While the drivers of these results remain unclear, emotional responses to coercive enforcement activity might contribute to unintended behavioral responses to tax audits.

1.2. Emotions and compliance behavior

One fundamental difficulty in studying emotions lies in the ambiguity of their definition. Emotions comprise behavioral, physiological, and expressive reactions, subjective experiences, and a cognitive, information processing component (Scherer, 2005). In order to differentiate emotions from other affect-related concepts, such as mood, we follow Scherer's approach by characterizing emotions as event focused and appraisal driven.

Over the past ten to fifteen years, the role of emotions in decision-making has been discussed increasingly among economists and psychologists (e.g., Lerner et al., 2015; Ekman, 2016; Volz and Hertwig, 2016). Emotions seem not only to be byproduct, but also drivers of decision processes (Summers and Duxbury, 2012) and several studies investigate the effects of emotions on decision-making and subsequent behavior (Zeelenberg and Pieters, 2006; Drouvelis and Grosskopf, 2016). Consequently, emotions have been found to affect the formation of political opinions (Petersen et al., 2012).

A growing body of research highlights the importance of emotions in compliance decisions (Hopfensitz and Reuben, 2009; Khadjavi, 2015). Emotional responses to sanctions seem to affect whether enforcement has positive or negative compliance implications (Sherman, 1993; Braithwaite, 1989). While emotional responses to perceptions of procedural justice appear to have positive effects on compliance (Barkworth and Murphy, 2015), feeling powerless or treated unfairly induces negative emotions and seems to stimulate criminal behavior (Agnew, 1992, 2001). Likewise, feelings of stigmatization and anger might induce desire for retaliation (Hopfensitz and Reuben, 2009) and thus promote future non-compliance (Barkworth and Murphy, 2015). On the other hand, feeling ashamed of one's wrongdoing might enhance the propensity of future compliance. Hopfensitz and Reuben (2009) show that guilt increases the effectiveness of deterrence measures and recent work finds that public shaming indeed elevates the willingness to comply with tax law (Alm et al., 2016; Coricelli et al., 2014).

Taken together, evidence on the relation between emotions and tax compliance is scarce and inconclusive. Initial work found that emotional arousal is associated with lower (Coricelli et al., 2010), but also with higher levels of tax compliance (Dulleck et al., 2016). But in order to gain a better understanding of the behavioral implications of emotions, it is critical to investigate not only arousal, but also valence of emotions (Russell, 2003). Against this background, this paper examines how emotional responses to tax authorities' actions affect the willingness to comply.

1.3. Hypotheses

In line with the assumptions of the SSF (Kirchler, 2007; Kirchler et al., 2008), we hypothesize that power and trust affect tax compliance. More specifically, we expect that both factors increase participants' general attitude towards complying with the law (intended tax compliance, see Kogler et al., 2013) while reducing the readiness to break the law in order to save on taxes (intended tax evasion, see Kirchler and Wahl, 2010). We further hypothesize that power induces enforced compliance, while trust elevates voluntary compliance (Kogler et al., 2013).

Moreover, we assume that emotions mediate the positive effects of trust and power on intended tax compliance. We expect that trust increases and power decreases positive emotions. Furthermore, and in line with prior findings (Balliet and Van Lange, 2013), we hypothesize that emotional responses to power are conditional on trust. We expect a significant positive interaction effect of trust and power on positive emotions. In turn, we expect positive emotions to translate into higher levels of intended tax compliance and lower levels of intended tax evasion.

We anticipate opposite effects for negative emotions. That is, we expect a negative effect of trust and a positive effect of power on negative emotions. Further, we assume a negative interaction effect of trust and power on negative emotions. Finally, we expect that negative emotions are related to lower levels of intended tax compliance and higher levels of intended evasion.

Because prior research on the role of emotions in tax compliance behavior is sparse, we refrain from a priori predictions on the effects of specific emotions on intentions to comply and focus on
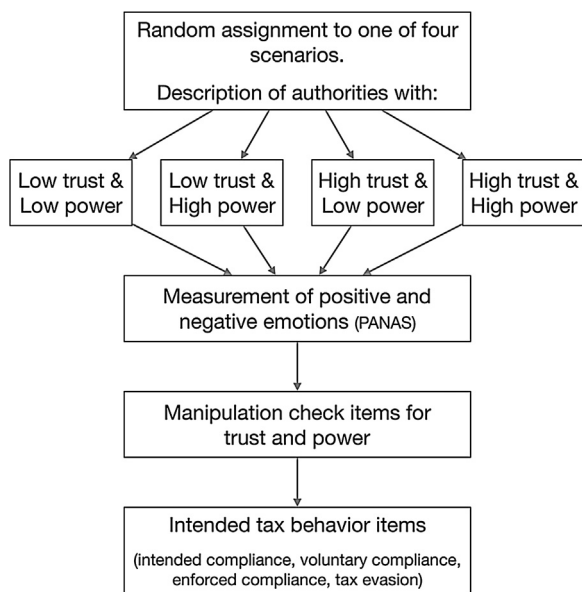
Fig. 1. Flowchart of the experimental-scenario procedure.

the role of the general affective state in terms of positive and negative emotions.[1] The exploratory analysis of specific emotions in the end of this paper provides first insights into relations between trust, power, and specific emotions.

2. Method

2.1. Procedure and participants

In order to investigate the role of emotions in tax compliance behavior, we conducted a scenario-based experiment with self-employed taxpayers in Malatya, Turkey. Scenario studies are widely used in business ethics research (Doyle et al., 2009), as they allow assessing complex research questions in real-world environments (Cavanagh and Fritzsche, 1985). Following Kogler et al. (2013) and Wahl et al. (2010), we used scenarios that described the tax system of a fictitious country named Varosia (see Appendix A for the complete scenario in Supplementary material). We experimentally manipulated the trustworthiness (low vs. high) and power (low vs. high) of Varosia's tax authorities, which resulted in a 2 × 2 between-subject design. Participants were randomly assigned to one of the following conditions: (1) *low trust* and *low power*, (2) *low trust* and *high power*, (3) *high trust* and *low power*, and (4) *high trust* and *high power*. Our materials are described in Section 2.2. After reading the scenario participants completed a survey on emotions and intentions to comply. The experimental procedure is depicted in Fig. 1.

A total of 600 paper-pencil surveys were randomly distributed by researchers of Inonu University among small-business owners in the city of Malatya. 468 surveys were completed and recollected (78% response rate). On average, it took about 20 min to complete the survey. Data collection took place between January 16th and March 18th 2015.

Table 1
Emotions by factor.

Factor	Emotion
Positive emotions	Active
	Alert
	Attentive
	Determined
	Enthusiastic
	Excited
	Inspired
	Interested
	Proud
	Strong
Negative emotions	Afraid
	Ashamed
	Distressed
	Guilty
	Hostile
	Irritable
	Jittery
	Nervous
	Scared
	Upset

Our sample comprised mainly owners of micro businesses such as groceries, restaurants, barber shops, and real estate agencies. The vast majority of participants worked in the trade (61.5%) and service (38.3%) sectors. We excluded employed taxpayers and participants who provided incomplete questionnaires from further analyses, so that the final sample comprised 411 self-employed participants (86.8% male[2]) with a mean age of 41.56 years (SD = 8.80). The number of observations per condition ranges from 102 to 104 and the distribution of gender and age did not differ between treatments. Participation was voluntary and not incentivized.

2.2. Materials

The study was conducted in Turkish. In the *high trust* scenarios, Varosia was described as a politically stable state with trustworthy, supportive tax authorities and transparent legislation. The *low trust* conditions outlined a state with little political stability, an inefficient and intransparent tax system, and unsupportive authorities. Similarly, in the *high power* scenarios the enforcement capacity of Varosia's authorities and the severity of fines for non-compliance were highlighted, while the *low power* treatments described a state with little enforcement capacity and inefficient instruments to deter taxpayers from non-compliant behavior. After reading the scenario, participants were asked to imagine living, working and paying taxes in Varosia as self-employed business owners and to answer a questionnaire that comprised items on experienced emotions, manipulation checks for trust and power, and intended compliance behavior. All survey items are in the appendix (Supplementary material).

Emotions were assessed with the Positive and Negative Affect Schedule (PANAS, Watson et al., 1988). Table 1 provides an overview of the emotions we assessed. Participants had to indicate their experience of 20 emotions when thinking about the fictitious country Varosia on a scale from 1 (*very slightly or not at all*) to 9 (*extremely*). The PANAS differentiates between ten positive and ten negative emotions (Watson et al., 1988). Both scales showed to be highly reliable with α = 0.83 for positive, and α = 0.86 for negative emotions. The correlation between the two measures was small but significant with r = −0.17, p < .001.

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[1] In experimental settings, specific emotions are usually induced by exposing participants to emotional stimuli such as video clips (Andrade and Ariely, 2009; Drouvelis and Grosskopf, 2016). In our case, however, we do not directly manipulate specific emotions, but investigate the effect of described tax system characteristics on emotions. Previous work on the role of emotions focused on crime and deterrence rather than tax compliance (Hopfensitz and Reuben, 2009; Khadjavi, 2015; Thiel et al., 2011).

[2] In Turkey, 70.8% of males and 29.4% of women participate in the labor force (United Nations Development Programme, 2013). Against this background, men are not substantially over-represented in our sample.

Table 2
Means and standard deviations in parentheses of key variables by condition.

Dependent variables	Trust scale	Power scale	Positive Emotions	Negative Emotions	Intended Compliance	Voluntary Compliance	Enforced Compliance	Tax Evasion
Low trust & Low power	2.03(1.44)	2.14(1.55)	2.56(1.23)	3.23(1.47)	4.20(1.85)	3.10(1.90)	2.10(1.47)	4.36(2.15)
Low trust & High power	1.80(1.49)	7.94(1.51)	2.89(1.12)	4.00(1.67)	4.75(2.02)	3.69(1.53)	6.16(1.57)	5.08(2.14)
High trust & Low power	7.73(1.16)	2.40(2.23)	2.96(1.11)	2.88(1.00)	5.62(1.64)	4.67(1.59)	3.32(1.88)	3.76(1.94)
High trust & High power	8.35(0.97)	8.19(1.23)	3.58(1.19)	2.65(1.41)	7.92(0.93)	6.26(1.60)	6.32(1.50)	3.20(1.75)

Note: N = 411. Columns 4 through 9 are further illustrated in Fig. 3.

The manipulation check scales for trust (e.g., "The governmental authorities in Varosia act fair towards their citizens") and power (e.g., The governmental institutions in Varosia are very effective in the suppression of tax criminality") comprised three items each. Both scales were highly reliable (α_{Trust} = 0.95; α_{Power} = 0.93).

The third set of questions assessed intended compliance behavior and was adapted from Kogler et al. (2013) and Kirchler and Wahl (2010). The intended compliance scale consisted of three items on individuals' general propensity to be compliant on their tax return (e.g., "How likely would you pay your tax completely honest?"; α = 0.82). The voluntary compliance scale comprised five items (e.g., "When I pay my taxes in Varosia as required by the regulations, I do so because I regard it as my duty as citizen"; α = 0.92), as did the enforced compliance scale (e.g., "When I pay my taxes in Varosia as required by the regulations, I do so because the tax office often carries out audits"; α = 0.94). In contrast, the readiness to evade was assessed with five short scenarios of situations that allow non-compliant behavior (e.g., "A customer paid in cash and did not require an invoice. You could intentionally omit this income on your tax return. How likely is it that you would omit this income"; α = 0.89). While intended tax compliance, i.e., the general tendency to comply, was assessed via Likert-type questions, fictitious scenarios were used to assess the propensity to evade in specific situations. The questionnaire concluded with a section on socio-demographic information. Descriptive statistics are displayed in Table 2.

3. Results

First, we report descriptive statistics. Second, we provide results of the manipulation checks. Third, we analyze whether positive and negative emotions mediate the effects of trust and power on compliance intentions. This section comprises four regression models, one for each dependent variable. Fourth, we explore how the experimental treatment affected specific emotions.

3.1. Descriptive statistics

Table 2 provides an overview of the key variables by condition. The first two columns depict the mean scores of the three manipulation check items and indicate a successful manipulation. The following two columns comprise the mean positive and negative emotion scores. Positive emotions were highest in the high trust and high power condition, while negative emotions were highest in the low trust and high power condition. The next three columns depict the three types of intended tax compliance. Compliance was lowest in the low trust and low power condition. In contrast, highest compliance rates were found in the high trust and high power condition. Finally, the last column presents mean tax evasion, which was highest in the low trust and high power condition.

3.2. Manipulation check

To check whether the manipulation of trust and power was successful, we calculated two multiple regression models with trust, power, and their interaction as independent variables and the scores of the manipulation check scales for perceived trust and power as dependent variables.

With regard to indicated trust, the regression model explained 85%, $F(3, 406)$ = 780.81, p < .001, of the variance in our data (untabulated). Trust had the strongest effect with B = 5.70, p < .001, while power, B = −0.23, p = .197, was not significant. The interaction of trust and power, B = 0.85, p < .001, showed a significant positive effect, indicating that power increased perceived trust in the case of trustworthy authorities. The regression model of perceived power explained 75% of total variance, $F(3, 407)$ = 415.12, p < .001. The effect of power was significant with B = 5.80, p < .001. Neither trust, B = 0.26, p = .262, nor the interaction between trust and power were significant, B = −0.01, p = .965. Overall, the manipulation of trust in authorities and power of authorities was successful.

3.3. Mediation analyses

3.3.1. Direct and indirect effects on compliance

Following Hayes (2013), we first estimated the direct effects of trust, power, and emotions on the four compliance measures. Subsequently, we investigated the indirect effects of trust and power on compliance through positive and negative emotions. Fig. 2 summarizes our mediation model which is tested separately for each of the dependent variables.

We used ordinary least square regressions to calculate a mediation model for each compliance measure (Hayes, 2013). The notation in the text corresponds to the labels in Fig. 2. In a first step, we analyzed the direct effects of trust, power, and their interaction (X_i) as well as the proposed mediators (M_k) on the compliance measures (Y_j) (Eq. (1)). Direct effects ($c'_{i,j}$) indicate the influence of an independent variable on the dependent variable with the proposed mediators (M_k) held constant.

$$Y_j = I_{Y_j} + c'_{1,j}X_1 + c'_{2,j}X_2 + c'_{3,j}X_3 + b_{1,j}M_1 + b_{2,j}M_2 + e_{Y_j} \qquad (1)$$

Subsequently, we estimate the relationship between an independent variable (X_i) and a mediator (M_k), labled $a_{i,k}$ (see Eq. (2)). Eq. (1) reveals that $b_{k,j}$ captures the association between a mediator (M_k) and a dependent variable (Y_j). The product of $a_{i,k}$ and $b_{k,j}$ ($a_{i,k}b_{k,j}$) is used to estimate the indirect effects of X_i on Y_j through M_k (Hayes, 2013).

$$M_k = I_{M_k} + a_{1,k}X_1 + a_{2,k}X_2 + a_{3,k}X_3 + e_{M_k} \qquad (2)$$

We use bias-corrected bootstrap confidence intervals of 10,000 bootstrap samples to identify indirect effects (i.e., for $a_{i,k}b_{k,j}$). A mediator is regarded as significant if the 95% confidence interval of the effect does not include zero (Table 5). Finally, we report total effects of X_i on Y_j, denoted as $c_{i,j}$ (untabulated). Total effects result from the sum of direct and indirect effects, thus the overall effect of a variable X_i on the response variable Y_j (Eq. (3)).

$$Y_j = I_{Y_j} + c_{1,j}X_1 + c_{2,j}X_2 + c_{3,j}X_3 + e_{Y_j} \qquad (3)$$

In order to interpret indirect effects not only based on statistical significance, but also based on practical effect size, we defined the following criterion: If the ratio of an indirect effect on the total
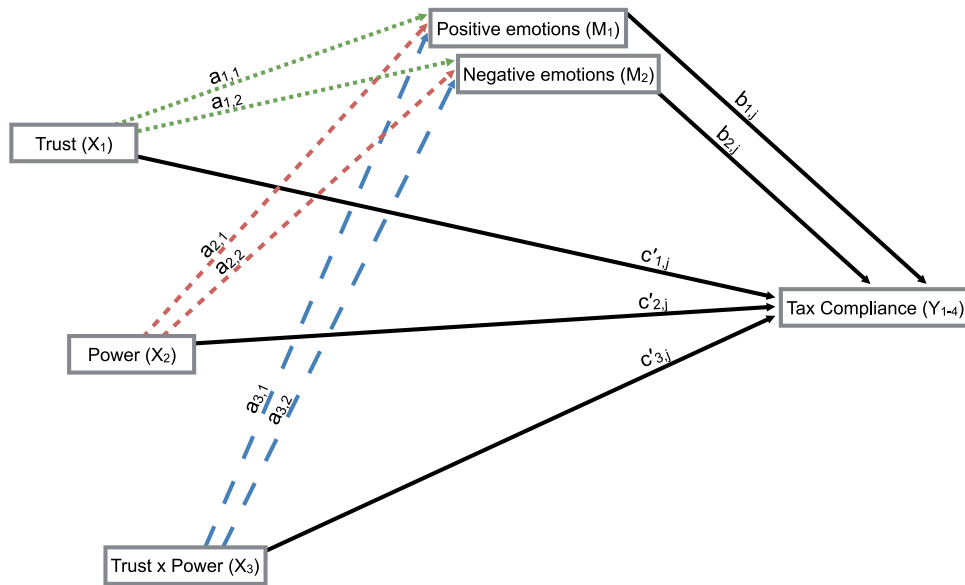
Fig. 2. Diagram of the general mediation model for all four dependent variables (Y_{1-4}: intended tax compliance, voluntary tax compliance, enforced tax compliance, and tax evasion). All reported regression coefficients in the text are labeled as presented in the diagram.

effect is ≥ 0.05, we report it in the text. This value expresses the proportion of the total effect (X_i on Y_j) that is mediated by M_k.

Given that the relationship between the experimental manipulation of trust and power (X_i) and the two emotion scores (M_k) (i.e., path $a_{i,k}$ in the mediation model) is the same in all four models, we first present these results (Table 3 and Fig. 3A and B), followed by all remaining effects by dependent variable (Table 4). Note that all regression results in the text refer to unstandardized regression coefficients. Standardized regression coefficients are reported in the regression tables.

3.3.2. Emotions

In line with our hypotheses, we observed a significant positive effect of trust on positive emotions ($a_{1,1} = 0.40$, $p = .014$), indicating that high trust increased positive emotions. While we predicted a negative effect of power on positive emotions, the effect of power was also positive and significant, $a_{2,1} = 0.33$, $p = .043$. Moreover, there was no significant interaction effect between trust and power on positive emotions, $a_{3,1} = 0.29$, $p = .212$. Hence, trust and power both showed a positive effects on positive emotions.

Contrary to our hypotheses, we did not observe significant differences in negative emotions between the high and the low trust conditions $a_{1,2} = -0.35$, $p = .076$. As predicted, however, high power increased negative emotions significantly, $a_{2,2} = 0.77$, $p < .001$. We found a significant interaction term, $a_{3,2} = -1.00$, $p < .001$, indicating a reversed effect in the high trust and high power condition. In line with our hypothesis, the effect of power on negative emotions was conditional on the level of trust. Fig. 3A and B shows that negative emotions were highest when high power was presented along with low trust, but lowest when tax authorities were described as highly powerful and highly trustworthy.

In the next section, we present the mediation model for each dependent variable. Fig. 3C–F presents mean compliance by condition and dependent variable. Table 4 provides a summary of the mediation models.

3.3.3. Intended tax compliance

We observed positive direct effects of trust, $c'_{1,1} = 1.19$, $p < .001$, and power, $c'_{2,1} = 0.52$, $p = .021$, on intended tax compliance. Furthermore, the interaction of trust and power was significant, $c'_{3,1} = 1.48$, $p < .001$, indicating that a combination of high trust and

high power increased intended tax compliance beyond the additive prediction of the two main effects.

The direct effect of trust on intended tax compliance was mediated by positive emotions. Trust increased positive emotions ($a_{1,1}$), which were positively associated with intended tax compliance ($b_{1,1}$). The indirect effect was significant with $a_{1,1}b_{1,1} = 0.17$ [0.04, 0.33].

Both emotion scores mediated the direct effect of power on intentions to comply. Power increased positive emotions ($a_{2,1}$), which were positively related to intended tax compliance ($b_{1,1}$). The indirect effect was significant with $a_{2,1}b_{1,1} = 0.14$ [0.01, 0.30]. However, power also significantly increased negative emotions ($a_{2,2}$), which were negatively related to intended tax compliance ($b_{2,1}$). The significant indirect effect was negative in this case with $a_{2,2}b_{2,1} = -0.11$ [−0.26, −0.03].

Only negative emotions mediated the effect of the interaction between trust and power on intended tax compliance. The interaction reduced negative emotions ($a_{3,2}$). Because negative emotions were negatively associated with intended tax compliance ($b_{2,1}$), the significant indirect effect was positive with $a_{3,2}b_{2,1} = 0.15$ [0.04, 0.34].

Total effects result from the sum of direct and all indirect effects of the respective predictor variable. Trust, for instance, had a direct effect ($c'_{1,1} = 1.19$, $p < .001$) and two indirect effects (0.17 and 0.05; see Table 5) on intended tax compliance. The resulting total effects were $c_{1,1} = 1.41$, $p < .001$ for trust, $c_{2,1} = 0.55$, $p = .019$ for power, and $c_{3,1} = 1.75$, $p < .001$ for the interaction of the two predictors.

3.3.4. Voluntary tax compliance

In line with our hypotheses, we find that trust had the strongest direct effect on voluntary tax compliance, $c'_{1,2} = 1.28$, $p < .001$. Moreover, we also observed a significant effect of power, $c'_{2,2} = 0.50$, $p = .020$. The interaction of trust and power, $c'_{3,2} = 0.70$, $p = .020$, showed a positive effect, indicating increased voluntary compliance intentions when authorities were described as trustworthy and also powerful.

Indirect effects follow the pattern of results described above. Positive emotions mediated the relationship between trust and voluntary tax compliance with $a_{1,1}b_{1,2} = 0.24$ [0.06, 0.47]. Trust increased positive emotions ($a_{1,1}$), which were positively associated with voluntary tax compliance ($b_{1,2}$).

Table 3
Summary of multiple regression analyses with trust, power, and their interaction as independent variables and the two emotion scores as dependent variables.

Variable		Positive emotions (M$_1$)				Negative emotions (M$_2$)		
		B	β	SE		B	β	SE
Intercept	I_{M1}	2.56***		0.11	I_{M2}	3.23***		0.14
Trust	$a_{1,1}$	0.40*	.16	0.16	$a_{1,2}$	−0.35	−.12	0.20
Power	$a_{2,1}$	0.33*	.16	0.16	$a_{2,2}$	0.77***	.26	0.20
Trust × Power	$a_{3,1}$	0.29	.10	0.23	$a_{3,2}$	−1.00***	−.29	0.28
R^2			.09				.12	
F			13.77***				17.86***	

Note: N = 411. Trust and power conditions were coded with 0 = low and 1 = high. *$p < .05$; **$p < .01$; ***$p < .001$.
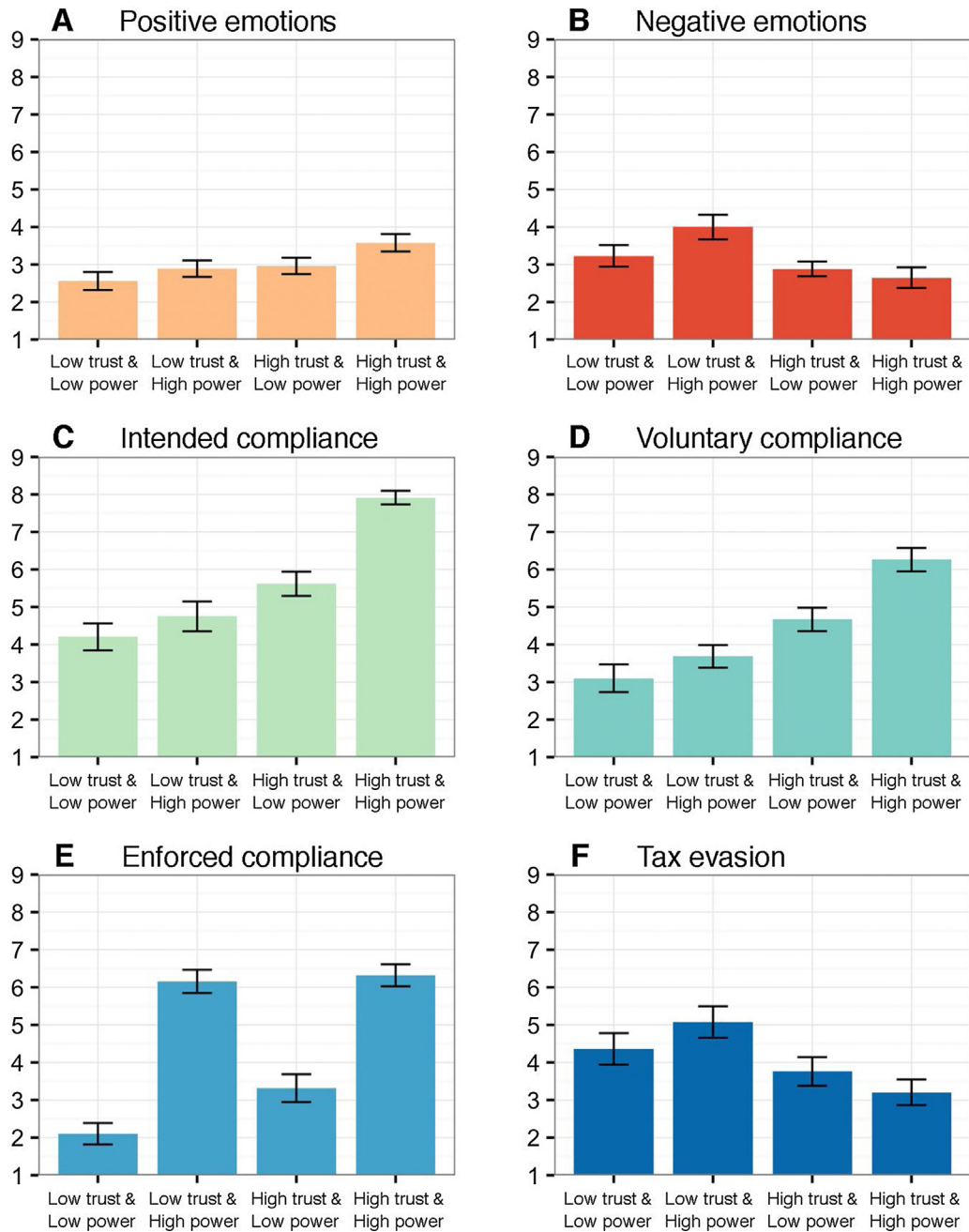

Fig. 3. Mean response by experimental condition for both emotion scores and all four intended compliance measures. Error bars represent 95% confidence intervals.

Similarly, our analysis revealed that the relationship between power and voluntary tax compliance was mediated by positive emotions with $a_{2,1}b_{1,2} = 0.20$ [0.01, 0.40]. We moreover found a neg-ative mediation effect of negative emotions with $a_{2,2}b_{2,1} = −0.11$ [−0.24, −0.03], where higher negative emotions were related to lower levels of voluntary tax compliance ($b_{2,2}$).

Table 4
Summary of multiple regression analyses with trust, power, their interaction, and the four mediators as independent variables and the four tax compliance measures as dependent variables.

Variable		Intended Compliance (Y_1)				Voluntary Compliance (Y_2)				Enforced Compliance (Y_3)				Tax evasion (Y_4)		
		B	β	SE		B	β	SE		B	β	SE		B	β	SE
Intercept	I_{Y1}	3.60***		0.31	I_{Y1}	2.06***		0.29	I_{Y1}	1.73***		0.31	$I_{Y1,4}$	1.66***		0.31
Trust	$c'_{1,1}$	1.19***	.27	0.22	$c'_{1,2}$	1.28***	.31	0.21	$c'_{1,3}$	1.13***	.23	0.23	$c'_{1,4}$	−0.27	−.06	0.22
Power	$c'_{2,1}$	0.52*	.12	0.22	$c'_{2,2}$	0.50*	.12	0.21	$c'_{2,3}$	4.02***	.83	0.23	$c'_{2,4}$	0.06	.01	0.22
Trust × Power	$c'_{3,1}$	1.48***	.30	0.31	$c'_{3,2}$	0.70*	.15	0.30	$c'_{3,3}$	−1.14***	−.20	0.32	$c'_{3,4}$	−0.38	−.08	0.32
Positive emotions (M_1)	$b_{1,1}$	0.43***	.24	0.07	$b_{1,2}$	0.60***	.35	0.06	$b_{1,3}$	0.19**	.10	0.07	$b_{1,4}$	−0.06	−.03	0.07
Negative emotions (M_2)	$b_{2,1}$	−0.15**	−.10	0.06	$b_{2,2}$	−0.14**	−.11	0.05	$b_{2,3}$	−0.04	−.02	0.06	$b_{2,4}$	0.88***	.62	0.06
R^2			.49				.47				.57				.46	
F			77.92				72.72 ***				108.21 ***				67.72 ***	

Note: N = 411. Trust and power conditions were coded with 0 = low and 1 = high. *$p < .05$; **$p < .01$; ***$p < .001$.

Table 5
Summary of all indirect effects.

Dependent Variable	Independent Variable	Mediator	Notation	Indirect effect	95% Confidence Interval		Ratio
					Lower limit	Upper limit	
Intended Tax Compliance	Trust	emo. +	a1,1b1,1	0.17*	0.04	0.33	0.12
		emo. −	a1,2b2,1	0.05*	0.00	0.14	0.04
	Power	emo. +	a2,1b1,1	0.14*	0.01	0.30	0.26
		emo. −	a2,2b2,1	−0.11*	−0.26	−0.03	−0.21
	Interaction	emo. +	a3,1b1,1	0.12	−0.06	0.36	0.07
		emo. −	a3,2b2,1	0.15*	0.04	0.34	0.08
Voluntary Tax Compliance	Trust	emo. +	a1,1b1,2	0.24*	0.06	0.47	0.15
		emo. −	a1,2b2,2	0.05*	0.01	0.13	0.03
	Power	emo. +	a2,1b1,2	0.20*	0.01	0.40	0.33
		emo. −	a2,2b2,2	−0.11*	−0.24	−0.03	−0.19
	Interaction	emo. +	a3,1b1,2	0.17	−0.08	0.45	0.17
		emo. −	a3,2b2,2	0.14*	0.04	0.31	0.14
Enforced Tax Compliance	Trust	emo. +	a1,1b1,3	0.08*	0.01	0.23	0.06
		emo. −	a1,2b2,3	0.01	−0.02	0.07	0.01
	Power	emo. +	a2,1b1,3	0.06*	0.00	0.20	0.02
		emo. −	a2,2b2,3	−0.03	−0.13	0.05	−0.01
	Interaction	emo. +	a3,1b1,3	0.06	−0.02	0.22	−0.05
		emo. −	a3,2b2,3	0.04	−0.06	0.17	−0.03
Tax Evasion	Trust	emo. +	a1,1b1,4	−0.02	−0.11	0.04	0.04
		emo. −	a1,2b2,4	−0.31*	−0.61	−0.01	0.51
	Power	emo. +	a2,1b1,4	−0.02	−0.10	0.03	−0.03
		emo. −	a2,2b2,4	0.67*	0.30	1.07	0.94
	Interaction	emo. +	a3,1b1,4	−0.02	−0.12	0.02	0.01
		emo. −	a3,2b2,4	−0.88*	−1.40	−0.41	0.69

Note: Effects are regarded as significant if the 95% confidence interval does not include zero. The respective indirect effects are marked with an asterisk symbol. The first column from right expresses the ratio of indirect effect to total effect of X on Y. Thus, it provides the relative contribution of the mediation effect on the total effect.

Finally, we observed that negative emotions mediated the relationship between the interaction of trust and power and voluntary tax compliance with $a_{3,2}b_{2,2} = 0.14$ [0.04, 0.31]. A combination of high trust and high power reduced negative emotions ($a_{3,2}$), which were negatively associated with voluntary tax compliance ($b_{2,2}$).

The resulting total effect of trust on voluntary compliance was $c_{1,2} = 1.56$, $p < .001$, while it was $c_{2,2} = 0.58$, $p = .012$ for power, and $c_{3,2} = 1.01$, $p = .002$ for the interaction.

3.3.5. Enforced tax compliance

Our analyses revealed significant effects of trust, power, and their interaction on enforced tax compliance. As expected, power had the strongest effect with $c'_{2,3} = 4.02$, $p < .001$, while high trust also resulted in higher enforced compliance levels, $c'_{1,3} = 1.13$, $p < .001$. The interaction effect of trust and power was negative and led to a decline in enforced tax compliance, $c'_{3,3} = −1.14$, $p < .001$, indicating that participants reported lower levels of enforced tax compliance, when trust and power were high.

As for indirect effects, trust increased the extent of positive emotions ($a_{1,1}$), which were positively associated with enforced tax compliance ($b_{1,3}$). Hence, the indirect trust effect was positive

with $a_{1,1}b_{1,3} = 0.08$ [0.01, 0.23]. We did not observe further indirect effects. As a result, the total effects were similar to the direct effects with trust, $c_{1,3} = 1.21$, $p < .001$, power, $c_{2,3} = 4.05$, $p < .001$, and an interaction effect of $c_{3,3} = −1.05$, $p = .001$.

3.3.6. Tax evasion

We did not find any direct effects of trust ($c'_{1,4} = −0.27$, $p = .221$), power ($c'_{2,4} = 0.06$, $p = .796$), or the interaction between trust and power ($c'_{3,4} = −0.38$, $p = .235$) on tax evasion. Significant indirect effects drive these results, as revealed by the total effects at the end of this section.

All three independent variables were significantly mediated by negative emotions. Trust decreased negative emotions ($a_{1,2}$), which were positively associated with intentions to evade ($b_{2,4}$). The resulting indirect effect was $a_{1,2}b_{2,4} = −0.31$ [−0.61, −0.01]. The indirect effect of power on tax evasion was positive $a_{2,2}b_{2,4} = 0.67$ [0.30, 1.07], and resulted from a positive association between power and negative emotions ($a_{2,2}$), as well as a positive relationship between negative emotions and tax evasion ($b_{2,4}$).

Finally, the interaction effect of trust and power on tax evasion was negatively mediated by negative emotions, $a_{3,2}b_{2,4} = −0.88$
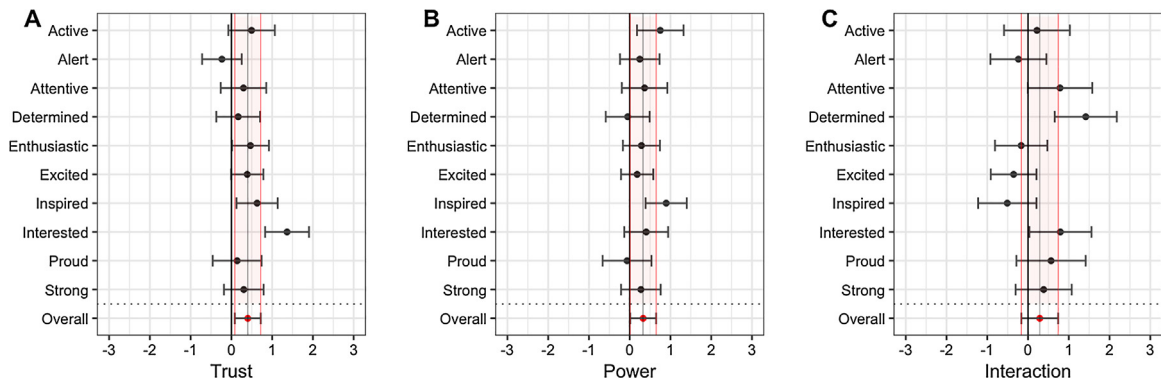
Fig. 4. The effects of trust and power on specific positive emotions. Dots indicate regression estimates. Error bars represent 95% confidence intervals of the effect estimate.
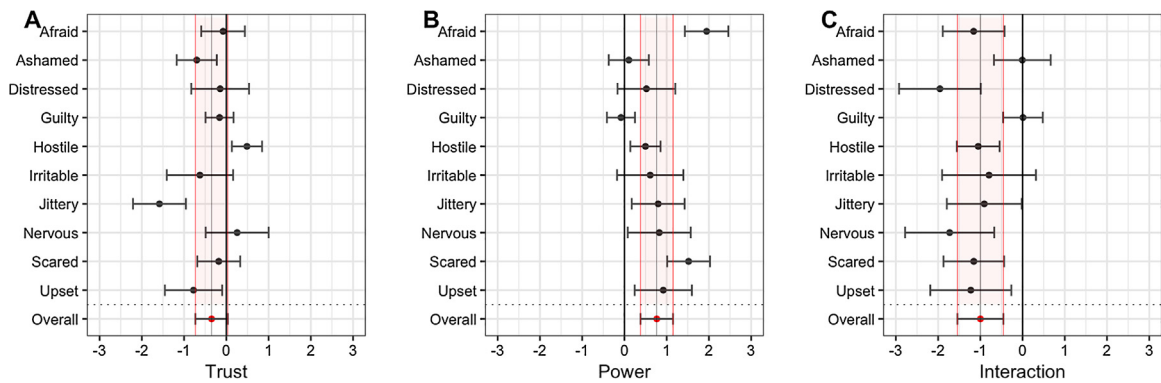

Fig. 5. The effects of trust and power on specific negative emotions. Dots indicate regression estimates. Error bars represent 95% confidence intervals of the effect estimate.

$[-1.40, -0.41]$. This result indicates that power triggered negative emotions, leading to more evasion, while a combination of high power and high trust yielded less negative emotions ($a_{3,2}$), alleviating intentions to evade ($b_{2,4}$).

The resulting total effects were all significant with trust decreasing tax evasion, $c_{1,4} = -0.60$, $p = .032$, power increasing tax evasion, $c_{2,4} = 0.71$, $p = .011$, and the combination of high trust and high power decreasing tax evasion, $c_{3,4} = -1.27$, $p = .001$.

3.4. Exploration of specific emotions

The aim of the exploratory analysis was to see to what extent specific emotions were influenced by trust, power, and their interaction. So far, the presented analyses focused on overall scores of positive and negative emotions, which comprise ten specific emotions each (see Table 1). Analyzing the predictors' effects on the specific emotions adds to the understanding of the dynamics underlying the mediation effects and – more globally – the relevance of specific emotions in tax decisions.

Figs. 4 and 5 show the effect estimates of trust, power, and their interaction on all twenty specific emotions as well as on the overall positive and negative emotion scores. To explain the rationale behind these analyses, we will focus on Panel A of Fig. 4 which illustrates the effect of trust on all ten specific positive emotions and the overall positive emotion score. To estimate the overall effect of trust we compared the low trust and low power condition against the high trust and low power condition. This effect parameter is depicted at the very bottom of the Figure and was introduced before as $a_{1,1} = 0.40$, $p = .014$ (Table 3) suggesting that increasing trust increased positive emotions. Additionally, the Figure displays the effect of trust on each specific positive emotion. The ten specific effects constitute the overall effect of trust on positive emotions.

In this case, increased feelings of interest and inspiration drive the positive main effect of trust on positive emotions.

Looking at Figs. 4 and 5, the following effects of trust, power, and their interaction on specific emotions seem to be most relevant. Trust increased interest and inspiration, while reducing jitter, upset, and shame. Power, on the other hand, increased inspiration, activation, fear, upset, and scare. The interaction of trust and power increased determination and interest, while reducing distress, fear, hostility, nervousness, scare, and upset. Overall, the patterns indicated considerable variation between different emotions of the same valence.

The differences in reported emotional reactions were particularly strong when comparing the low trust and high power condition to the high trust and high power condition. Two radar charts illustrate individuals' emotional responses to these two treatments (Figs. 6 and 7). For instance, if authorities were described as powerful but untrustworthy, participants indicated stronger feelings of upset, distress, jitter, scare, and nervousness compared to the case where authorities were powerful and trustworthy. In line with our main analyses, these results indicate that individuals' evaluation of deterrence were likely moderated by trust.

4. Discussion

The aim of this paper is to provide initial indication of the role of emotions in tax compliance behavior. More specifically, we investigate whether positive and negative emotions mediate the effects of tax authorities' characteristics on intentions to comply. Our findings are in line with the main hypotheses and indicate that taxpayers' feelings indeed mediate the effect of tax authorities' collection strategies on intended tax compliance. While, to our knowledge, studies on the SSF have neglected the role of emotions,
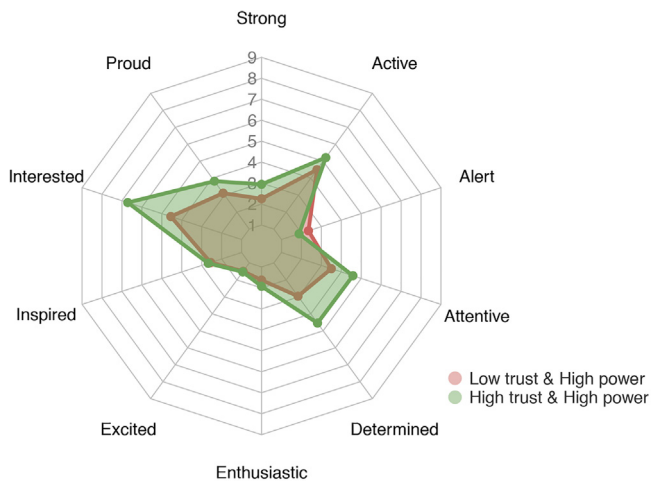
Fig. 6. Specific positive emotions for low trust and high power and for high trust and high power.
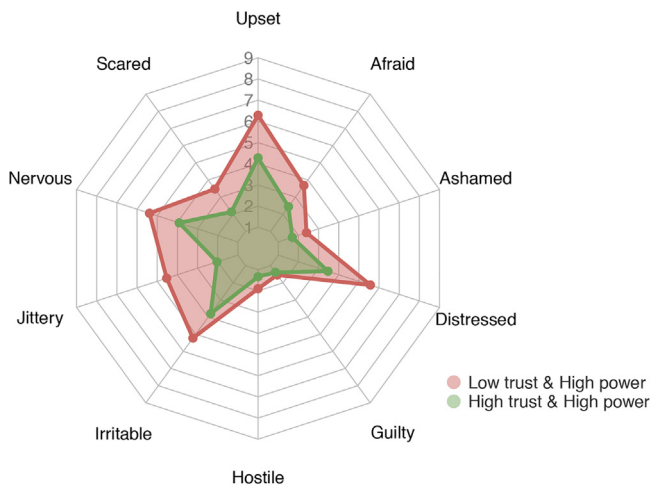

Fig. 7. Specific negative emotions for low trust and high power and for high trust and high power.

our findings indicate that emotional processes might contribute to tax compliance behavior.

In line with the SSF, the results confirm our hypotheses regarding the effects of trust and power. Trust in the tax authorities as well as deterrence measures show positive effects on intentions to comply. Furthermore, the positive effects of trust and power are amplified by a combination of high trust and high power.

With regard to the emotional implications of tax authorities' characteristics, the results partly confirm our hypotheses. As expected, the trust manipulation increases positive emotions. However, we are unable to confirm the hypothesis that trust decreases negative emotions.

While power, as expected, increases negative emotions, it also elevates positive emotions. This result seems contradictory. However, it indicates that deterrence measures may have differential effects on taxpayers. For instance, tax evaders may perceive power as a threat, inducing negative emotions. Honest taxpayers, on the other hand, might appreciate enforcement, because it protects them from free riders. Experiencing positive emotions, they are thus more likely to comply. The differential effect of tax enforcement has been shown in earlier studies on tax compliance behavior (Beer et al., 2015; Mendoza et al., 2017).

Furthermore, we find that trust moderates the effects of high power: the positive effect of high power on negative emotions and

its negative effect on positive emotions are reversed when trust levels are high. This is in line with previous findings from Balliet and Van Lange (2013), who find that the positive effect of power on cooperation is conditional on trust.

Regarding the mediation effects of emotions, we observe that powerful revenue bodies that force taxpayers to comply induce negative emotions such as anger, distress, and jitter. These negative feelings, however, have two-fold effects on compliance intentions: they increase enforced compliance but they also elevate the readiness to evade. Ultimately, negative emotions are likely to undermine tax morale, as they are negatively related to pro-social behavior (Drouvelis and Grosskopf, 2016). Against this background, it seems questionable weather deterrence measures have entirely positive compliance effects. We find that a combination of enforcement activities and trust building measures reduces negative feelings. This stimulates not only intentions to comply, but also alleviates the propensity to evade. Tax policies that aim at promoting voluntary compliance should thus complement traditional command and control approaches with efforts to build trust by promoting transparency, increasing procedural fairness, intensifying outreach to taxpayers, and strengthening the provision of services.

Our instrument (PANAS) measures a very broad set of emotions and allows identifying general levels of positive and negative emotions, yet it might not capture some emotions that are relevant in the context of taxation (Watson et al., 1988). This might explain why our global effect estimates and the effect sizes of the indirect effects, although statistically significant, are not very large.

Experimental evidence indicates that emotions which have the same valence and appear to be similar may lead to opposing behavioral outcomes (Summers and Duxbury, 2012). Against this background, it is instructive to analyze the differential impact of trust and power on specific positive and negative emotions. We explore the effects of trust and power on specific emotions and observe substantial variation in emotions of the same valence (c.f. Figs. 4 and 5 for details). For instance, power increases feelings of fear and scare but shows not to affect distress and irritation. A combination of power and trust, on the other hand, reduces negative emotions such as fear, scare, jitter, nervousness, and hostility, but does not affect feelings of guilt and shame. This indicates that building trust potentially mitigates negative emotional responses to enforcement activity.

Counterintuitively, negative emotions do not differ significantly between the low and high trust conditions. Analyzing the effects of trust on specific emotions, however, reveals that individuals indicate lower levels of shame, jitter, and upset in the high trust conditions, suggesting that trust alleviates certain negative emotions. This adds an interesting perspective to findings on the effectiveness of public shaming in deterring tax evasion (Alm et al., 2016). But while some studies find that public shaming reduces non-compliant behavior (Coricelli et al., 2014), we observe a positive correlation between feelings of shame and intentions to evade taxes (untabulated). This suggests that the dynamics between shame and trust might mitigate the compliance implications of public shaming, which offers a promising avenue for future research.

The survey-based approach used in this paper has some limitations. Generally, cross-sectional survey studies are unable to detect causal effects, while mediation models assume causal relationships (Fiedler et al., 2011; MacKinnon and Pirlott, 2015). Based on the experimental nature of our questionnaire, we may assume causality between the independent variables (trust and power manipulation) and the dependent variables (mediators and compliance intentions). We are, however, unable to provide proof of causality for the relationship between mediators and dependent variables. As emotional responses were measured after reading the scenario text and before providing answers to the compliance

measures, we believe that a directional interpretation is plausible. Future studies should experimentally manipulate emotions and test for causal effects on tax compliance behavior.

But while incentivized laboratory experiments allow identifying causal relationships, they often lack external validity. As it is difficult to recruit self-employed business owners for participation in laboratory experiments, most experiments rely on student samples. Conversely, scenario studies allow assessing complex research questions in real-world environments within more relevant populations (Cavanagh and Fritzsche, 1985). Scenario-based experiments usually use sample sizes comparable to laboratory experiments,[3] and are widely used in business ethics research (Doyle et al., 2009). One strength of our approach is its external validity, as we investigate self-employed taxpayers in their actual business environment. This is particularly relevant when studying emotions, which are difficult to induce in the laboratory. However, as we cannot rule out self-selection, we acknowledge that our sample might not be fully representative for the population of self-employed business owners. Despite this, we believe that participants' emotional responses to the tax system characteristics described in our study do not differ systematically from taxpayers' feelings in real-life situations. Likewise, we do not believe that lack of incentives induced an experimenter demand effect, because we do not expect participants to share a uniform understanding of how trust and power should impact on emotions. For instance, some taxpayers might perceive enforcement as threatening and thus express fear, while others might feel protected by effective administrative structures.

Because our study assesses behavioral intentions rather than actual behavior, it does not provide insights into taxpayers' compliance choices. While a substantial body of evidence generally confirms a strong link between intended and actual behavior (e.g. Fishbein and Ajzen, 1975; Sheppard et al., 1988), the relationship is less clear in the field of taxation (Hite, 1988; Weigel et al., 1987), where external factors, such as audits, strongly affect behavior (e.g. Kleven et al., 2011). Nevertheless, it is likely that a decrease in attitudes towards taxation will have negative rather than positive compliance implications (Lewis, 1982). Against this background, we are confident that our study adds to the understanding of the dynamics between the behavior of tax authorities, emotions, and intentions to comply.

Conflict of interest

None.

Acknowledgment

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.irle.2018.05.004.

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[3] A power analysis revealed that a sample size of $N = 411$ in a multiple regression model with three to five predictors has a power of 0.80 to detect effects as small as Person $r = 0.14$ (Cohen's $d = 0.28$, odds ratio = 1.65). We are thus confident that our sample is sufficiently large.

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