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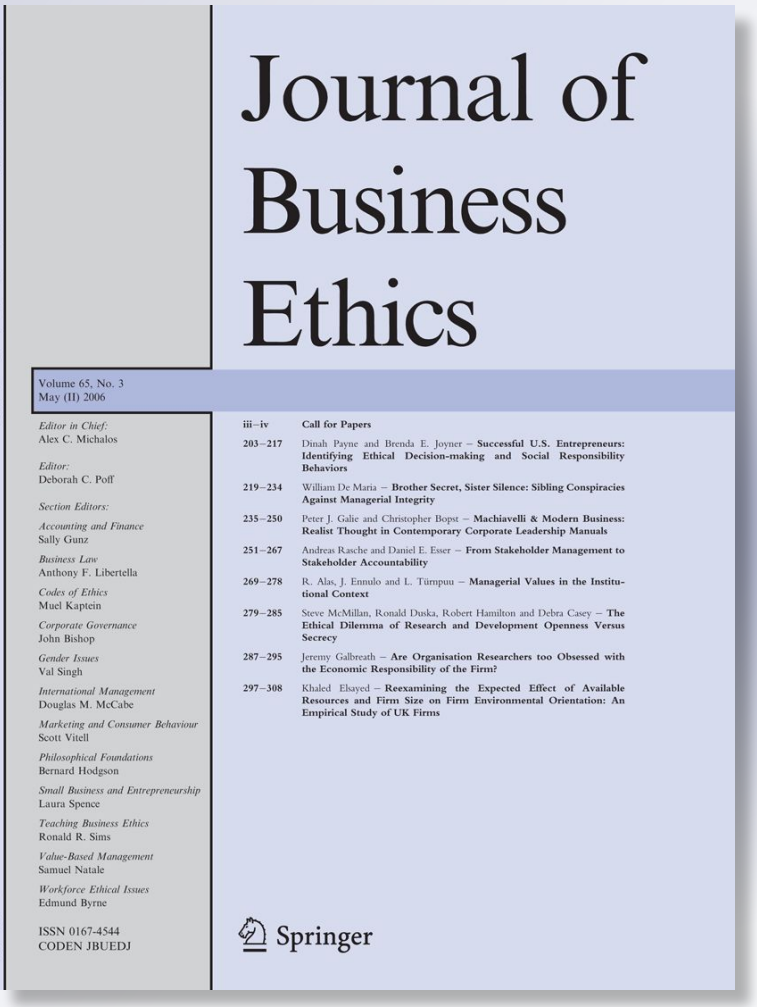

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Rationality Versus Emotions: The Case of Tax Ethics and Compliance

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Abstract Businesses that rely heavily on cash transactions have been found to be particularly susceptible to low tax ethics. Recent research indicates that cash is a highly powerful and tempting reward, which elicits a strong emotional response. In this article, we investigate how emotions affect tax ethics in a series of experimental studies. Specifically, we show that affective priming and the ease with which tax information is retrieved moderate tax ethics. We also show that the relative effectiveness of deterrence, such as audit probabilities and tax fines, is moderated by affect. These results point toward a complex picture of tax ethics, requiring a multifaceted policy approach that emphasizes not only enforcement, but also cognitive and affective aspects of human behavior.

Keywords Affect · Cognition · Emotions · Tax compliance · Tax ethics · Tax evasion · Rationality

Introduction

The importance of the small and medium-sized business sector for economic growth has steadily increased over the last decades (OECD 2005). At the same time, this sector's compliance with tax regulations has been poor (Joulfaian and Rider 1998). This has been attributed to a high reliance on cash transactions (Morse et al. 2009), allowing businesses to under-report income (Richardson and Sawyer 2001) and evade VAT (Webley et al. 2006). The level of underreporting is substantial with estimates of up to 50% for cash transactions (Bankman 2007).

How can we explain such a brazen display of low tax ethics? The standard paradigm in tax research assumes rational decision-makers, who engage in deliberate reasoning by remaining calm and cool when assessing the anticipated benefits and costs of evading taxes. In this article, we explore an alternative viewpoint by investigating how tax ethics is affected by the interplay of cognition and affect.

We define cognition as mental processes that deal with knowledge acquisition, including awareness, perception, reasoning and judgment. In contrast, affect is defined as feelings and emotions. Finally, we define tax ethics as an umbrella term, captured by a multiple-measure approach in a series of experimental studies. In these studies we use fictitious case scenarios and ask participants to assume the role of self-employed business owners.

We motivate our focus on emotions by exploring the link between low tax ethics and the high proportion of cash transactions for small and medium-sized businesses. From a psychological viewpoint this link is not surprising, since money is a highly powerful and tempting reward, which elicits a strong emotional response (Pessiglioni et al. 2007). Indeed, a preliminary pilot study,[1] in which we asked 60 taxpayers to complete a short survey, reveals that deliberate reasoning—the focus of standard tax research—and

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[1] Details are available from the authors upon request.

affect—the focus of this article—are two distinct factors of tax behavior.

The remainder of the article is organized as follows: In the subsequent section, we review the literature on the economic determinants of tax evasion and discuss the evidence that decisions are influenced by both cognitive and affective factors. We then present and discuss three experimental studies that investigate the interplay of cognitive and affective aspects of tax ethics, before concluding with a general discussion of our findings.

Economic Determinants of Tax Evasion

A large body of work on tax behavior has been inspired by, or relates to, the seminal theoretical papers by Allingham and Sandmo (1972) and Srinivasan (1973). These papers draw upon the standard economic framework, which assumes that taxpayers weigh the expected utility of the benefits from successful tax evasion with the risky prospect of detection and punishment. According to this framework, a rise in audit probability and a rise in tax fines increase tax compliance. The empirical evidence is largely supportive of the deterrent effect of greater enforcement via audits and fines, although some of the evidence is also mixed.

With respect to audit probability, Fischer et al. (1992) and Kirchler et al. (2010) point out that most of the empirical studies support a positive effect of audit probability on tax compliance, although the effects are not always strong. Pommerehne and Weck-Hannemann (1996; Weck-Hannemann and Pommerehne 1989) found positive effects for Swiss taxpayers and Ali et al. (2001) report similar results for US citizens. Support for the effectiveness of frequent audits was also reported in numerous experimental studies (Alm et al. 1995; Gërxhani and Schram 2006; Trivedi et al. 2003, 2005; Webley et al. 1991). However, some of the earlier studies (e.g., Wärneryd and Walerud 1982; Spicer and Thomas 1982) found no evidence for audit probabilities on compliance.

Actual past experiences of audits may have a stronger effect than merely presenting audit probabilities (Kastlunger et al. 2009; Kirchler et al. 2010; Webley 1987). Somewhat surprisingly, however, past audits seem to decrease compliance rather than increase it, at least in the short-run. Guala and Mittone (2005), for instance, observed in their experiments that compliance sharply decreases after an audit, naming this reaction the "bomb-crater" effect (Mittone 2006). Maciejovsky et al. (2007) showed that such effects are less pronounced for fines than for audit probabilities.

With respect to tax fines, their effects on compliance were often weaker than expected (Alm et al. 1992, 1995; Friedland 1982; Park and Hyun 2003). Also, several studies found no support for the deterring effects of fines altogether (Collins and Plumlee 1991; Pommerehne and Weck-Hannemann 1996; Spicer and Lundstedt 1976; Webley et al. 1991) and some studies even suggest that a rise in penalties can result in an increase in tax evasion (Fjeldstad and Semboja 2001; Martinez-Vazquez and Rider 2005; Schwartz and Orleans 1967; Strümpel 1969).

Taken together, these findings suggest that tax compliance might be a concept too complex to be explained purely by economic variables (Kirchler 2007). Indeed, many studies have been put forward that stress alternative determinants of tax behavior, like trust (Murphy 2004), fairness and justice (Braithwaite 2003; Wenzel 2002, 2003), social norms (Wenzel 2005), or ethics (Alm and Torgler 2011). In this article, we propose that affect—and its interplay with cognition—moderate the relative effectiveness of economic determinants of tax ethics (like audit probabilities and fines).

Cognitive and Affective Factors of Decision Making

The conflict between rationality and emotions on decision outcomes has long been recognized, preoccupying philosophers, classical writers, and scholars for many centuries (Pham 2007). It inspired a long tradition in psychology on dual-process models of thought (for an early discussion see James 1890/1950), suggesting a contrast between a controlled (cognitive) system, which is intentional, interruptible, effortful, and sequential, and an automatic (affective) system with the exact opposite qualities—unintentional, not interruptible, effortless, and parallel (for recent reviews see Hogarth 2001; Myers 2002).

A large number of such dual-process models have been proposed in an attempt to reconcile seemingly contradictory findings in judgment and decision-making (Kahneman and Frederick 2002; Sloman 1996, 2002; Stanovich 1999; Stanovich and West 2002). Interestingly, regardless of the exact nature of the proposed mechanism, the predictions derived from these models are often very similar (Payne and Bishara 2009). For instance, when individuals are rushed or distracted, their response is more likely to be dominated by the affective system relative to the cognitive system.

Consistent with this prediction, White Americans are more likely to mistake a harmless object for a weapon when it is paired with a Black person than when it is paired with a White person. The extent of the bias increases with faster response times (Payne 2001). Subjects are more likely to choose an unhealthy food item when they are cognitively distracted by mentally rehearsing a longer number than when rehearsing a shorter number (Shiv and Fedorkhin 1999). Similarly, smokers consume more cigarettes when

they are distracted than when they are not (Westling et al. 2006).

The interplay of cognition and affect in decision-making (Monin et al. 2007; Roeser 2006) has been substantiated by recent research that investigates the neural basis for moral judgments using functional imaging (Moll et al. 2005). These studies have shown that the same cortical brain areas are involved in social cognition and moral judgment (Forbes and Grafman 2010), suggesting a high degree of interdependence of emotional responses to stimuli and higher-order cognitive operations (Wood and Grafman 2003). Coricelli et al. (2010) show that emotions, measured by skin conductance responses, predict cheating, and its extent, in a tax evasion experiment.

The impact of affect on decision-making also extends to people's attributions and inferences (Forgas 2008). Individuals tend to attribute their affective state to whatever object is their current focus of attention (Schwarz and Clore 1996) and report higher life satisfaction when surveyed on sunny days as compared to rainy days, due to differences in weather-related mood (Schwarz and Clore 1983). These effects seem to extend to financial markets. Above-average stock market performance has been found on sunny days and below-average performance on rainy and winter days (Hirshleifer and Shumway 2003; Kamstra et al. 2003; Saunders 1993).

People also have been shown to use feelings as information. The ease with which information comes to mind—in essence how accessible it is—guides people's inferences about their moods, emotions, metacognitive experiences, and bodily sensations (Schwarz 2012). For instance, individuals consider themselves less assertive when recalling examples of their own assertive behavior is hard (Schwarz et al. 1991); hold an attitude with less confidence when listing supporting arguments is difficult (Haddock et al. 1999); and consider an event less likely when listing many reasons for its occurrence is demanding (Sanna and Schwarz 2004).

The Present Studies

In this article, we contribute to the growing literature on the affective determinants of financial decision-making. This literature shows, for instance, that affect influences professional judgments of auditors (Bhattacharjee and Moreno 2002), capital budgeting decisions (Kida et al. 2001), risk-taking decisions (Moreno et al. 2002), tax decisions (Schultz et al. 2011), and predicts cheating in a tax evasion experiment (Coricelli et al. 2010). Unlike previous studies, we are particularly interested in the interplay of cognition and affect, drawing upon two streams of literature: Scope insensitivity and accessibility of information.

Scope Insensitivity and Tax Behavior

Scope insensitivity captures the finding that subjective valuations about different quantities are a function of the processing mode. When people rely on feelings, they tend to be insensitive to variations in scope, whereas when they rely on cognition, they tend to be relatively more sensitive to scope. For instance, when people were asked how much they would be willing to pay (WTP) for 5 Madonna CDs or 10 Madonna CDs, people who relied on cognition showed a greater increase in WTP from 5 CDs to 10 CDs as compared to people who relied on feelings (Hsee and Rottenstreich 2004). The latter group's WTP for the two CD collections did not differ significantly.

One explanation for these findings is that affective responses are spontaneous, immediate, diffuse and non-specific (Zajonc 1980). They are often outside of conscious awareness and require virtually no cognitive processing (Murphy and Zajonc 1993). Consequently, when people, who rely on feelings, are asked to evaluate different CD collections by a specific artist, they tend to focus on the immediate and diffuse feeling associated with that artist—rather than on counting the number of CDs or to infer the market value of the CDs from comparable collections.

Translating these findings into the domain of tax decisions lead us to propose the following hypothesis in the alternate form:

H1 Participants, who rely on cognition, show a greater sensitivity to an increase in tax fines—in terms of compliance rates—as compared to participants, who rely on affect.

Accessibility of Information and Tax Behavior

Accessibility of information has been shown to be a function of frequency and recency of activation of that information in memory (Higgins 1989). More frequent and more recent information is more accessible. Ease of retrieval of information leads to more confidence, even when the information is inaccurate (Kelley and Lindsay 1993). Since frequently performed behaviors are more accessible and thus easier to recall, the opposite suggests that those behaviors, which are performed less frequently, are less accessible and thus harder to recall. Hence, the perceived difficulty of recalling a behavior may be used as a proxy for its overall probability (Schwarz et al. 1991).

In line with these predictions, Rothman and Schwarz (1998) showed that when participants were asked to list many factors that increase the risk of heart disease (a relatively difficult task), their perceived vulnerability to heart disease was evaluated lower than those asked to list only a few factors (a relatively easy task). Similarly, Raghubir and

Menon (1998) have shown that recalling a larger number of AIDS-related behaviors (a relatively difficult task) diminished participants' subjective risk estimates of contracting AIDS compared to recalling a smaller number of behaviors (a relatively easy task).

Translating these findings into the domain of tax decisions lead us to propose the following hypothesis in the alternate form:

H2 Participants asked to list many reasons to justify evading (paying) taxes show a higher (lower) compliance rate than those asked to list few reasons.

We test H1 in Study 1 and H2 in Study 2. Finally, we explore the interaction of scope insensitivity and information accessibility in the third study. For that study we propose the following hypothesis in the alternate form:

H3 The effectiveness of audit probability and tax fines on tax compliance is moderated by the interaction of scope insensitivity and information accessibility.

We use fictitious case scenarios in our studies to obviate the need for participants to recall past behaviors, which often lead to biased recalls (Kirchler and Wahl 2010). Moreover, the use of case scenarios allows us to keep the information constant across participants, rendering responses more comparable (Suhling et al. 2005).

Study 1

We study the impact of incidental affective priming on tax compliance. This form of priming consists of having subjects complete supposedly unrelated tasks before the tax-compliance task.

Method

One hundred fifty-four UK adults, approached at car parks of shopping malls and public parks in West London, participated in the study.

Participants were asked to complete a brief questionnaire. We used a 3 (priming: cognitive, affective, and control) × 2 (scope of fine: 100% of evaded amount and 500% of evaded amount) between-subjects design. The priming questions followed Hsee and Rottenstreich (2004) and either encouraged valuation by calculation (cognitive priming) or valuation by feeling (affective priming). The former questions were:

> If an object travels at five meters per minute, then by your calculations how many meters will it travel in 360 seconds?
>
> If a consumer bought 30 books for € 540, then, by your calculations, on average, how much did the consumer pay for each book?

The questions with respect to valuation by feeling were:

> When you hear the name "George W. Bush," what do you feel?
> Please use one word to describe your predominant feeling.
> When you hear the word "baby," what do you feel?
> Please use one word to describe your predominant feeling.[2]

After the priming questions, participants were asked to assume that they were self-employed and occasionally have the opportunity to complete a sale without issuing an invoice. Participants indicated on a nine-point Likert scale how likely it would be for them to under-report their income from such transactions (higher scale values indicating higher likelihoods).

Results and Discussion

Hypothesis test: A 3 (priming) × 2 (scope) analysis of variance (ANOVA) with the likelihood of underreporting as dependent variable yielded—as predicted by H1—a significant two-way interaction effect between priming and tax fine. Also, the likelihood of underreporting was significantly higher for low tax fines ($M = 5.72$, SD = 2.19) as compared to high tax fines ($M = 4.59$, SD = 2.55). No other effects were significant. Table 1 shows the ANOVA results, Table 2 shows the means and standard deviations of the interaction, and Fig. 1 displays the interaction graphically.

Our results show that tax compliance is systematically affected by whether or not decision-makers were put into a cognitive or affective mindset. For the latter, tax compliance did not depend on the quantitative scope of the tax fine ($t(52) = 1.22$, $p < 0.05$). It was only when decision-makers were put into a cognitive mindset that they responded differently to different levels of tax fines, exhibiting higher rates of compliance for higher levels of fines ($t(47) = 3.57$, $p < 0.05$). As expected, the responses in the control conditions fell in-between the priming conditions, suggesting that the baseline processing style is a mixture of cognitive and affective influences.

[2] In a pre-test, we noted that the first question tended to be associated with neutral or negative responses, whereas the second question resulted mainly in neutral or positive responses. In the study, we have therefore counter-balanced the order of these two priming questions. Our results, however, do not show any differences regarding the order, so we pooled the data for our analysis.

Table 1 Tests of between-subjects effects (Study 1)

Source	SS	df	F	p-value	η^2
Corrected model	92.91	5	3.38	0.006	0.10
Intercept	4093.24	1	744.20	<0.001	0.83
Priming	8.98	2	0.82	0.444	0.01
Scope (tax fines)	52.11	1	9.48	0.002	0.06
Priming × scope (tax fines)	34.48	2	3.13	0.046	0.04
Error	814.03	148			
Total	5011	154			
Corrected total	906.94	153			

$R^2 = 0.10$, adjusted $R^2 = 0.07$

Table 2 Means, standard deviations, and sample sizes for the interaction of priming and scope on the likelihood of underreporting (Study 1)

Priming	Tax fines	M	SD	N
Cognitive	Low	6.72	1.72	25
	High	4.29	2.48	24
Affective	Low	5.04	2.17	28
	High	4.89	2.75	27
Control	Low	5.48	2.35	25
	High	4.56	2.47	25

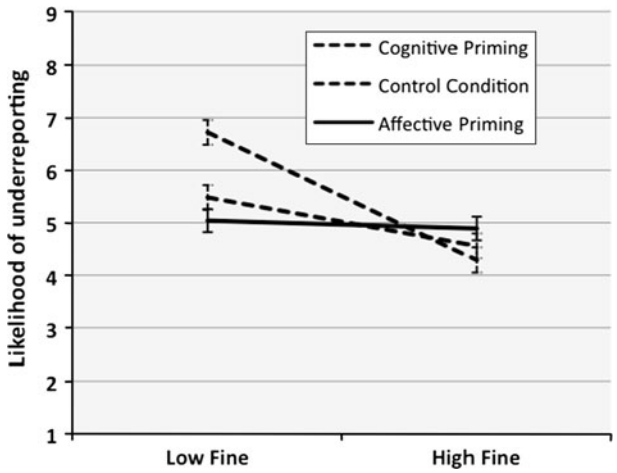

Fig. 1 Average reported likelihood of underreporting as a function of priming and scope (standard errors are displayed as *vertical bars*)

Study 1 demonstrates that the effectiveness of economic variables, in this case the level of tax fines, is moderated by the contrast between cognitive and affective information processing. In Study 2, we further investigate these moderation effects by studying whether information accessibility can influence tax compliance.

Study 2

We study how the ease with which information comes to mind affects tax evasion.

Method

Ninety-nine UK adults, approached at car parks of shopping malls and public parks in West London, participated in the study.

Participants were asked to complete a brief questionnaire, consisting of two sections. In the first section, participants were randomly assigned to one of four experimental conditions of a 2 (reasons: 1 or 10) × 2 (justification: evading or paying taxes) between-subjects design. Participants either listed 1 or 10 reason(s) that justify evading taxes or that justify paying taxes. The first factor captures the relative ease with which information comes to mind. We expected that listing 1 reason would be considerably easier than listing 10 reasons. To test this intuition, we included a manipulation check: Participants were asked to indicate how difficult it was to list reasons on a nine-point Likert scale (higher scale values indicating higher difficulties). In the second section, participants were asked to assume they were self-employed and had the opportunity to complete a sale without issuing an invoice. Participants indicated on a nine-point Likert scale how likely it would be for them not to issue an invoice (higher scale values indicating higher likelihoods).

Results and Discussion

Manipulation check: Even though the average number of reasons listed by participants in the 10-reasons condition was only 5.06 (SD = 2.93), subjects in the 10-reasons condition expressed significantly higher levels of difficulties in listing reasons ($M = 6.38$, SD = 1.95) than subjects in the 1-reason condition ($M = 3.66$, SD = 1.58; $t(97) = 7.59$, $p < 0.05$, $d = 1.54$).

To control for potential differences between the reasons-conditions with respect to the quality of the reasons listed, we have classified the reasons into five different classes (tax system, individual life situation, public goods, justice, other). There is no statistically significant difference between the distributions of classes between the 1-reason condition and the 10-reasons condition with respect to the first reason listed (Mann–Whitney test, $p > 0.05$). This finding suggests that people list similar reasons in both situations, i.e., when asked to provide just one reason or when asked to provide 10 reasons.

Hypothesis test: A 2 (reasons) × 2 (justification) ANOVA with the likelihood of not issuing an invoice as dependent variable and the number of reasons listed as a covariate yielded—as predicted by H2—a significant

interaction effect between reasons and justification. No other effects were significant. Table 3 shows the ANOVA results, Table 4 shows the means and standard deviations of the interaction, and Fig. 2 displays the interaction graphically.

The two-way interaction effect suggests that if participants find it easy to provide evidence that justifies paying taxes (asking participants to list 1 reason for paying taxes), they are significantly less inclined not to issue an invoice as compared to the case where such evidence is difficult (asking participants for 10 reasons to pay taxes). Contrasting results are observed when participants find it easy to provide evidence that justifies evading taxes (asking participants to list 1 reason for evading taxes). In this case, participants were significantly more likely not to issue an invoice than when providing evidence for tax evasion was comparatively difficult (asking participants to list 10 reasons for evading taxes). In sum, if it is easier to come up with reasons that justify paying (evading) taxes, then individuals will more likely (not) issue a tax invoice.

Table 3 Tests of between-subjects effects (Study 2)

Source	SS	df	F	p-value	η^2
Corrected model	95.29	4	3.82	0.006	0.14
Intercept	798.90	1	128.05	<0.001	0.58
Listed reasons (covariate)	1.26	1	0.20	0.654	0.01
Justification	17.15	1	2.75	0.101	0.03
Reasons	5.72	1	0.92	0.341	0.01
Justification × reasons	62.76	1	10.06	0.002	0.10
Error	586.48	94			
Total	3048	99			
Corrected total	681.78	98			

$R^2 = 0.14$, adjusted $R^2 = 0.10$

Table 4 Means, standard deviations, and sample sizes for the interaction of justification and reasons on the likelihood of not issuing an invoice (Study 2)

Justification	Reasons	M	SD	N
Evading taxes	1	6.36	2.19	25
	10	4.19	2.50	27
Paying taxes	1	3.82	2.22	22
	10	5.12	3.07	25

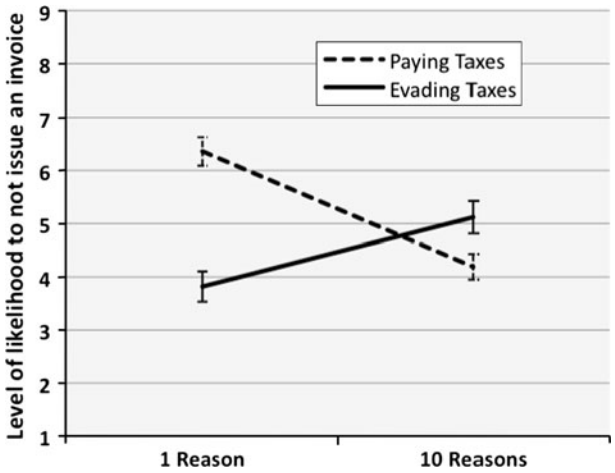

Fig. 2 Average reported likelihood of not issuing an invoice as a function of justification and reasons (standard errors are displayed as *vertical bars*)

These findings are in line with the work on information accessibility (see Schwarz 2012, for a recent overview). This work suggests that it is not the absolute number of reasons provided that informs inferences, but the ease with which such information can be retrieved. If it is difficult to provide evidence in favor of tax evasion, then people conclude that there might be no good justification for it, and hence, engage in lower levels of evasion. The opposite holds true for providing evidence in favor of paying taxes. If retrieving evidence for paying taxes is difficult, then people conclude that there might be no compelling justification to paying taxes, and hence, engage in higher levels of evasion.

The first two studies combined showed that tax decisions are systematically affected by the interplay of cognitive and affective information processing. Incidental affective priming resulted in tax compliance rates that were relatively invariant across different magnitudes of tax fines (Study 1). The ease with which information could be retrieved cognitively guided decision-makers' judgments about how likely they would engage in tax evasion (Study 2).

The purpose of Study 3 is twofold. On the one hand, we aim to further investigate the interplay of cognitive and affective information processing by combining "scope insensitivity" and "information accessibility." On the other hand, we aim to show that economic determinants of tax evasion, like tax audits and fines, are moderated by this interplay of cognition and affect.

Study 3

We study the impact of incidental affective priming and the ease with which information comes to mind on tax evasion.

Method

Four hundred sixty-three students (42% were female) from the University of Vienna, aged 20–33 years ($M = 23.53$, SD = 2.25), participated in the study.

Table 5 Tests of between-subjects effects for the complete model (Study 3)

Source	SS	df	F	p-value	η^2
Corrected model	216.29	15	4.02	<0.001	0.12
Intercept	17029.54	1	4749.22	<0.001	0.91
Priming	21.02	1	5.86	0.016	<0.01
Reasons	50.95	1	14.21	<0.001	0.03
Audit rate	32.55	1	9.08	0.003	0.02
Tax fine	15.32	1	4.27	0.039	<0.01
Priming × reasons	43.17	1	12.04	0.001	0.03
Priming × audit rate	35.65	1	9.94	0.002	0.02
Priming × tax fine	6.65	1	1.85	0.174	<0.01
Reasons × audit rate	1.18	1	0.33	0.566	<0.01
Reasons × tax fine	0.51	1	0.14	0.706	<0.01
Audit Rate × tax fine	0.03	1	0.01	0.931	<0.01
Priming × reasons × audit rate	4.48	1	1.25	0.264	<0.01
Priming × reasons × tax fine	0.16	1	0.04	0.834	<0.01
Priming × audit rate × tax fine	0.33	1	0.09	0.762	<0.01
Reasons × audit rate × tax fine	2.07	1	0.58	0.448	<0.01
Priming × reasons × audit rate × tax fine	0.26	1	0.07	0.788	<0.01
Error	1638.69	457			
Total	18319	473			
Corrected total	1854.981	472			

$R^2 = 0.12$, adjusted $R^2 = 0.09$

Participants were asked to complete a brief questionnaire. They were randomly assigned to one of sixteen experimental conditions of a 2 (priming) × 2 (reasons) × 2 (audit rate) × 2 (tax fine) between-subjects design. The first factor refers to incidental priming (cognitive vs. affective, similar to Study 1, but without the control condition).[3] The second factor refers to the number of reasons that subjects were asked to retrieve (1 reason vs. 10 reasons, similar to Study 2, but we only focus on the justification of evading taxes—not paying taxes). The third factor refers to the audit rate (low vs. high). Participants in the low-audit condition were informed that the probability of an audit would be 1%; whereas in the high-audit condition, they were told it would be 50%. And finally, the fourth factor refers to the tax fine (low vs. high). Participants in the low-fine condition were informed that the tax fine would be 100% of the evaded amount; whereas in the high-fine condition, they were told that it would be 500% of the evaded amount.

After this initial part of the questionnaire, participants were asked to assume they were self-employed and had the opportunity to complete a sale without issuing an invoice. They were asked to indicate on a nine-point Likert scale how likely they would be not to issue an invoice (with higher scale values indicating higher likelihoods).

Results and Discussion

Hypothesis test: We computed a 2 (priming) × 2 (reasons) × 2 (audit rate) × 2 (tax fine) ANOVA with the likelihood of not issuing an invoice as dependent variable. H3 predicted a significant four-way interaction effect, respectively significant three-way interaction effects with priming and reasons as two factors and either audit rate or tax fine as the third factor. Our results do not confirm this prediction (see Table 5 for the ANOVA results).

The results of the full model (Table 5) show that all four main effects (priming, reasons, audit rate, and tax fine) as well as the interaction of priming and reasons as well as the interaction of priming and audit rate are statistically significant (see Table 6 for the means and standard deviations of the interactions). These findings, however, should be interpreted with caution, as they were not hypothesized and are the result of multiple comparisons with an increased risk of type-I errors.

Since all the higher order interactions (i.e., all interactions beyond the two-way interactions) are insignificant, we re-estimated the ANOVA model by eliminating all interactions with p-values greater than 0.25 iteratively (starting with the least significant interaction at a time). Table 7 shows the between-subjects effects of the reduced

[3] For affective priming, we used an Austrian politician (H. C. Strache) instead of George W. Bush. Strache is well known in Austria and polarizes voters. At the time of the data collection, he ranked second to last in the national confidence index of politicians with a value of minus 48 points (OGM 2010).

Table 6 Means, standard deviations, and sample sizes for the interaction of priming, reasons, audit rate and tax fine on the likelihood of not issuing an invoice (Study 3)

Priming	Number of reasons	Audit rate	Tax fine	*M*	SD	*N*
Affective	1	Low	Low	6.03	1.47	31
			High	5.68	1.81	28
		High	Low	6.10	1.80	29
			High	5.47	1.57	30
	10	Low	Low	6.17	2.21	30
			High	5.25	1.43	28
		High	Low	6.07	1.93	29
			High	5.59	1.50	29
Cognitive	1	Low	Low	7.21	1.86	29
			High	7.27	1.80	30
		High	Low	6.58	1.79	31
			High	6.33	2.14	30
	10	Low	Low	6.35	2.07	31
			High	6.19	2.06	27
		High	Low	4.97	2.15	31
			High	4.83	2.37	30

model. The model has a similar degree of fit (as inferred from the adjusted R^2 value) as the complete model, however, the results are now significant for all main effects and the two-way interactions between priming and reasons and priming and audit rate (see Table 7). Using the Bonferroni correction to control for multiple comparisons (at $\alpha = 0.05$) indicates that the main effect for audit rate and the two-way interactions between priming and reasons and priming and audit rate are significant. These interactions are displayed graphically in Fig. 3a and b, respectively.

Table 7 Tests of between-subjects effects for the reduced model (Study 3)

Source	SS	df	*F*	*p*-value	η^2
Corrected model	207.30	7	8.36	<0.001	0.11
Intercept	17044.50	1	4810.20	<0.001	0.91
Priming	21.01	1	5.96	0.015	0.01
Reasons	51.08	1	14.41	<0.001	0.03
Audit rate	32.60	1	9.20	0.003	0.02
Tax fine	15.63	1	4.41	0.036	<0.01
Priming × reasons	44.14	1	12.46	<0.001	0.03
Priming × audit rate	35.63	1	10.06	0.002	0.02
Priming × tax fine	6.45	1	1.82	0.178	<0.01
Error	1647.69	465			
Total	18919	473			
Corrected total	1854.981	472			

$R^2 = 0.11$, adjusted $R^2 = 0.10$

The significant interaction effects between priming and reasons and priming and audit rate are in line with our predictions and the empirical findings from Studies 1 and 2. However, note that we failed to replicate the significant interaction between priming and tax fine ($p = 0.18$). One reason for this lack of replication might be that the effect of fines on compliance is dominated by the effect of audit rates. Indeed, the effect size of audit rates is higher than the effect size of fines for both the main effects and the interactions.

We motivated this study by our interest to further investigate the interplay of cognitive and affective information processing and by our prediction that this interplay moderates the relative importance of economic determinants of tax evasion, like tax audits and fines.

Our results shed new light on both areas. First, we find evidence that the interaction of priming and information

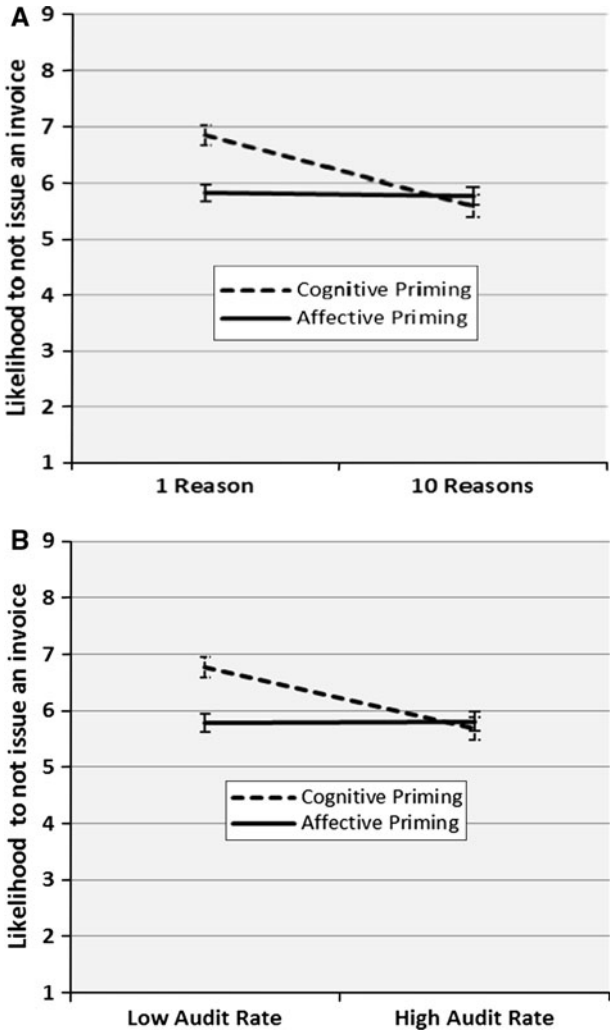

Fig. 3 Average reported likelihood of not issuing an invoice as a function of **a** priming and reasons, and **b** priming and audit rate (standard errors are displayed as *vertical bars*)

accessibility affects tax decisions in a precise and theoretically plausible way. Affective priming attenuates the effects of ease of information retrieval compared to cognitive priming. We also found evidence that cognitive and affective information processing impact how decision-makers evaluate the relative risk of engaging in tax evasion. When decision-makers are primed cognitively, they respond by adjusting the likelihood of engaging in tax evasion in the predicted manner: Higher audit rates lead to lower likelihoods of tax evasion. However, when decision-makers are primed affectively, they exhibit the same levels of tax evasion, regardless of whether the situation is characterized by high or low levels of deterrence (as inferred from audit rates).

General Discussion

The traditional paradigm in tax research posits that taxpayers are rational. They weigh the expected utility of the benefits from successful tax evasion with the risky prospect of detection and punishment. According to this framework, a rise in audit probability and a rise in tax fines increase tax compliance. The empirical evidence regarding these predictions, however, is mixed, prompting alternative explanations of tax behavior, like trust (Murphy 2004), fairness and justice (Braithwaite 2003; Wenzel 2002, 2003), social norms (Wenzel 2005), or ethics (Alm and Torgler 2011).

In this article, we contribute to this literature by studying the influence of emotions on tax ethics. We were particularly interested in exploring how affect moderates the relative effectiveness of standard tax determinants, like audit probabilities and fines. Our results are crystal clear: Study 1 showed that incidental affective priming moderated the effectiveness of tax fines on compliance. Study 2 demonstrated that the ease with which participants cognitively retrieved tax-related information moderated the decision whether or not to issue an invoice for a business transaction. And finally, Study 3 showed that the interplay of cognitive and affective factors moderated the relative effectiveness of audit probabilities in vignettes on tax evasion.

Our research findings provide important new insights in helping policy makers to understand the multifaceted environment of tax compliance better. Specifically, we found that emotions and the ease of retrieval of arguments, favoring or opposing tax evasion, affect behavioral intents. Emotions reduced the probability of deliberate and rational decision-making. Emotionally primed participants did not consider all the relevant tax information in their compliance decisions. Moreover, emotions lead to ignoring the actual *level* of tax fines, and thus an increase in fines did not increase compliance (in contrast to cognitive priming). Policy makers should consider that strong emotions, which are, for instance, elicited by reports about the tax behavior of people in the public interest, could influence citizens' feelings about adequate punishment and consequently their perception of retributive justice. Regarding the availability of arguments supporting honest tax paying, our results suggest that highlighting severe cases of evasion and fines in the media may lead to more evasion in the public rather than less. This may be due to the fact that media reports on tax evasion may lead citizens to believe that such behavior is "normal" and frequent. Instead of reporting cases and percentages of evasion, it seems more promising to officially mention cases of strong honesty and percentages of people paying their share correctly, accompanied by reports on public goods provided by the state funded by tax payments. Such reports not only facilitate retrieval of arguments in favor of cooperation but also strengthen the social norm of cooperation. Information on the strength of institutional conditions with efficient government activities should affect taxpayers' willingness to cooperate (Torgler 2007). Indeed, the influence of tax ethics is stronger, the stronger the direct democracy in a jurisdiction and the visibility of political activities and provision of public goods (Torgler 2005).

One limitation of the current study is the reliance on experiments, which, however, serve an important bridging function between theory and empirical research (based on field data). Laboratory experiments allow for the systematic variation of important institutional variables, such as tax rates, audit probabilities, and penalties (Torgler 2002), providing an important tool for studying policy changes (Alm et al. 1992). For instance, determining the effects of an increase of tax rates or audit probabilities on ethics and compliance. Still, some concerns remain: The use of experiments entails trading off internal validity at the expense of external validity. Laboratory studies are often artificial and abstract (Spicer and Thomas 1982); they rely on neutral or loaded instructions (Abbink and Henning-Schmidt 2006), are based on self-reports (Hessing et al. 1988) and fictitious case scenarios (Kirchler and Wahl 2010), and often draw on student samples with limited experience in tax decisions (Baldry 1987). Although these concerns are important, they do not qualify the main contribution of the present article, i.e., to advance the theoretical understanding of how cognition and affect influence tax decisions, since there is no reason to believe that the cognitive processes of taxpayers and students differ.[4]

Future research on the interplay of cognition and affect should extend the focus of analysis from illegal tax evasion to ethically and morally questionable—but legal—attempts

[4] Indeed, Studies 1 and 2, based on the responses of UK adults, show qualitatively similar results to earlier pilot studies, conducted with students.

at reducing the tax burden, like tax avoidance and tax flight (Kirchler et al. 2003). More research is also needed on the relation between induced affect (the approach of the present study) and the physiological measurement of affect (Coricelli et al. 2010). Future research should also study how affect relates to trust (Murphy 2004), fairness and justice (Braithwaite 2003; Wenzel 2002, 2003), social norms (Wenzel 2005), moral suasion (Torgler 2004), and conditional cooperation (Frey and Torgler 2007). Recent evidence suggests that people dislike taxes more than other equivalent costs (Sussman and Olivola 2011), suggesting that framing effects might increase compliance. Our use of affective priming suggests that it can lead to positive or negative associations. In future study, it would be interesting to explore which associations have a stronger impact on tax compliance. Also, it would be interesting to explore how long- or short-lived our priming manipulations would be.

In summary, our results provide strong empirical evidence that the interplay of cognition and affect moderates the relative effectiveness of key economic variables, like audit probabilities and fines. These results point toward a complex picture of tax ethics, requiring a multifaceted policy approach that emphasizes not only enforcement, but also cognitive and affective aspects of human behavior.

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