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We Learn Not for School but for Life: Empirical Evidence of the Impact of Tax Literacy on Tax Compliance

Anca Nichita

Faculty of Economic Sciences, "1 Decembrie 1918" University of Alba Iulia, Alba Iulia, Romania

Larissa Batrancea

Faculty of Business, Babeş-Bolyai University, Cluj-Napoca, Romania

Ciprian Marcel Pop

Ioan Batrancea

Faculty of Economics and Business Administration, Babeş-Bolyai University, Cluj-Napoca, Romania

Ioan Dan Morar

Faculty of Economic Sciences, University of Oradea, Oradea, Romania

Ema Masca

Faculty of Economics, Law and Administrative Sciences, University of Medicine, Pharmacy, Sciences and Technology of Targu Mures, Targu Mures, Romania

Ana Maria Roux-Cesar

Applied Social Sciences Center, Graduate School of Accounting, Mackenzie Presbyterian University, São Paulo, Brazil

Denis Forte

Strategic Finance Department, Mackenzie Presbyterian University, São Paulo, Brazil

Henrique Formigoni

Applied Social Sciences Center, Graduate School of Accounting, Mackenzie Presbyterian University, São Paulo, Brazil

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Correspondence should be addressed to Anca Nichita, Faculty of Economic Sciences, "1 Decembrie 1918" University of Alba Iulia, 15-17 Unirii Street, Alba Iulia 510009, Romania. E-mail: ancaramona.nichita@gmail.com

Adilson Aderito da Silva

Applied Social Sciences Center, Managing Business Development, Mackenzie Presbyterian University, São Paulo, Brazil

Tax revenues are fundamental budgetary resources for the majority of governments around the world. Consequently, the goal of identifying efficient strategies that facilitate an increase in tax compliance should be on the agenda of all tax authorities. By surveying 358 Romanian taxpayers, our study analyzes how tax literacy influences tax compliance, thus contributing to the existing literature, which reports few results on this topic. Using moderation analysis, we find that tax literacy is one of the key elements shaping tax compliance. Respondents who reported more neutral social representations of taxation concepts turned out to be more tax literate and more willing to comply voluntarily. The level of tax literacy was estimated using a tax literacy index created for this purpose. Our study provides policy makers with a starting point for understanding how taxpayers comprehend taxation concepts and how they relate to the tax system. Equipped with such information, those charged with designing tax policy could help raise literacy among taxpayers, making the role of tax collection more salient and ultimately improving tax compliance.

Keywords: tax authorities, tax behavior, tax compliance, tax literacy index

JEL Classification: E62, H29

INTRODUCTION

"We learn not for school but for life," a well-known saying that reverses Seneca's original assertion (Janson 2004), emphasizes the applicability of knowledge and skills acquired through formal educational institutions to real-life decisions. Specifically, the saying underlines the role of formal education and its link to the demands of real life. In a globalized knowledge-based economy, information and skills should be acquired not just for their own sake but mainly because economic decisions and economic growth are based on these theoretical and practical tools. Making economic decisions without an adequate, up-to-date, and accurate knowledge set could have short- and long-term consequences at both the individual and societal levels.

Formal education ultimately influences decision making because it shapes attitudes (Nilsson, Ekehammar, and Sidanius 1985), promotes compliance with norms such as being public spirited (Lochner 2011), and supports the disclosure of income obtained from all sources (Mayhew and Murphy 2009). Therefore, in the field of tax behavior, studies examine taxpayers' level of knowledge and skills concerning tax matters in view of their potential to shape attitudes and actions and ultimately to improve income reporting.

Joining the global conversation on tax compliance and the efforts made by international organizations to instill in taxpayers' a "culture of compliance" and cooperation, this article analyzes how tax literacy influences tax compliance attitudes. We define tax literacy as taxpayers' ability to understand their rights and obligations, to make use of their tax knowledge and skills in order to fill in tax returns correctly, and to comply with the tax laws in effect. By tax compliance attitudes, we mean taxpayers' positive or negative disposition (Erwin 2001)

toward paying their taxes. These attitudes emerge when one assesses a situation that entails an interaction with tax authorities. People who express negative attitudes toward paying their fair share and supporting the common good are expected to comply less frequently than those who have a positive attitude.

The topic of the study is deeply rooted in current economic realities because the degree to which taxpayers are familiar with tax issues influences compliance and the size of the shadow economy, which in turn determine the efficiency of the system of public goods and the quality of life. For instance, highly educated taxpayers can obtain substantial income via legal activities and, at the same time, display willingness to pay their taxes, which finances state budgets, contributing to the advancement of society and economic growth. By contrast, low tax literacy translates into lower tax compliance (OECD 2010, 76) and lower government revenue, which reduces the availability of public goods. Moreover, low tax literacy imposes additional costs on society, for it affects the implementation of sound tax policies and hinders efficient tax collection.

Although the literature reports numerous studies on financial literacy (Braunstein and Welch 2002; Bryant 2013; Bumcrot, Lin, and Lusardi 2013; Grifoni and Messy 2012; Klapper, Lusardi, and Panos 2013; OECD 2014, 2016; Remund 2010)—namely people's capacity for managing their financial resources using financial knowledge and skills—theoretical and empirical investigations regarding tax literacy and how it affects tax compliance are quite scarce. Therefore, our study fills this gap by analyzing this relationship via a tax literacy index that we designed to this end. The novelty of our research is that, to the best of our knowledge, this article is the first to advance and estimate a tax literacy index capturing the characteristics of a tax system in Eastern Europe, which is then used in relationship to compliance. In this regard, our study can give authorities a starting point for understanding how taxpayers comprehend taxation concepts and how they relate to the tax system. Equipped with such information, tax authorities could subsequently design efficient policies for raising tax literacy, making the role of tax collection more salient and ultimately improving tax compliance behavior.

Using data collected from 358 Romanian taxpayers, we computed a tax literacy index, ranging between 0 (tax illiterate) and 1 (fully tax literate), based on theoretical and practical items. Our results indicated that respondents had a moderate level of tax literacy, which corresponded to their self-assessment. By far the fewest correct answers were given in response to questions about consumption taxes (i.e., VAT definition, VAT computation). In addition, by testing a moderation effect via regression analysis, we found a significant relationship between our tax literacy index and compliance attitudes.

This study contributes to the growing body of research on tax literacy and to raising awareness on the improvement in taxpayers' attitudes and overall compliance levels through better taxation knowledge and skills. Taxation-related concepts are omnipresent elements in people's lives because of ongoing interactions with tax authorities as well as consumption needs, labor, lucrative activities, business investment, wealth holdings, and so forth. A deeper understanding of the tax system and its concepts could make a difference in terms of compliance levels. That is, those who are tax literate grasp the importance of paying taxes, can report their full taxable income as stipulated in the tax code and can correctly report the taxes they owe. These people have the knowledge and skills to claim all the benefits to which they are entitled, thus using redistribution policies properly (Prasad 2008).

We used several methods in conducting our research. Opinions regarding the quality of public goods were captured with descriptive statistics, words and word associations linked to tax concepts such as "tax," "fiscal fee," and "mandatory social contribution" were investigated with correspondence analysis (Beh and Lombardo 2014), and social representations of taxation concepts were analyzed using polarity and neutrality indices (de Rosa 1995). We computed the tax literacy index by considering all correct answers by respondents to eleven items. Moreover, the relationship between tax literacy and compliance attitudes was investigated via moderation analysis (Hayes 2013), and, to identify the effect of the moderator, we estimated confidence intervals with bias-corrected and accelerated (BCA) bootstrapping and 1,000 bootstrap samples.

The reminder of the paper is organized as follows. Section 2 offers insights into recent literature regarding tax literacy. Section 3 showcases the method, sample pool, and procedure. Section 4 presents empirical results. Section 5 discusses results and outlines our concluding remarks, study limitations, and avenues for future research.

LITERATURE REVIEW

Judging from the current literature (Altman 2012; Atkinson and Messy 2012; Joo and Grable 2000; Leiser, Sevón, and Lévy 1990; Lo Prete 2013), the topic of economic and financial literacy has become an interesting research subject among academics (Fernandes, Lynch, and Netemeyer 2014; Gathergood 2012; Mandell 2008; Mandell and Schmid Klein 2009; Schwartz Driver 2009; Stanculescu 2010; Weaver 2011), businessmen, regional and international organizations, such as the European Commission, the Organisation for Economic Co-operation and Development (OECD 2005, 2016; OECD and US Treasury Department 2008), the World Bank (Miller et al. 2009), politicians, and the public, especially in the context of the economic turmoil triggered by global and regional crises over the past decade.

Either by elaborating indices that highlight significant correlations between a country's financial literacy level and the poverty level (Bumcrot, Lin, and Lusardi 2013) or by assessing and ranking financial literacy at the global level (Atkinson and Messy 2012; Grifoni and Messy 2012; Xu and Zia 2012), researchers emphasize the importance of financial knowledge in a country's economic development because it leads to better economic outcomes (Joo and Grable 2000).

In addition to supporting people in acquiring financial knowledge and maintaining high levels of financial literacy, the government should also pay particular attention to and improve tax literacy, which is often neglected but essential for modern societies to function. Although studies investigating tax literacy are growing in number, they are still scarce, with no standard definition of the tax literacy concept. Hence, Chardon (2011) favors the inclusion of taxation in the concept of financial literacy using the following reasoning. Taxpayers who can claim all the benefits to which they are entitled, who file accurate tax returns, meet taxpaying deadlines, and efficiently interact with professional advisors make substantially better financial decisions and are in a better overall financial position. According to Genest-Grégoire, Godbout, and Guay (2017b, 4), tax literacy is "the knowledge, skills and confidence to make responsible tax decisions."

In our view, tax literacy is the ability of taxpayers to understand their rights and obligations and to use tax knowledge and skills to fill in tax returns correctly as well as comply with the tax

laws in effect. Tax literacy is therefore connected to the tax knowledge possessed by taxpayers (Niemirowski, Baldwin, and Wearing 2003; Niemirowski et al. 2002; Schmölders 1959, 1960), which consists of information regarding both tax obligations (i.e., fiscal fees, taxes, mandatory contributions) and the manner in which the mechanism of collecting and redistributing taxes works.

The literature reports studies on estimating tax literacy levels (Chardon, Freudenberg, and Brimble 2016a, 2016b; Genest-Grégoire, Godbout, and Guay 2016, 2017a). For instance, Chardon (2014) outlines the results from a tax literacy study with 604 Australian respondents that compared their self-assessed confidence in tax literacy levels with actual levels. After quantifying answers regarding aspects such as the types of deductions available, the mechanism of marginal tax rates, distinctions between deductions and offsets, and the tax impact from investment in property, Chardon concluded that measured tax literacy levels were positively correlated to respondents' self-reported confidence regarding their knowledge of the tax system. In addition, the results also showed that women, younger respondents, low-income earners, and those exposed less frequently to paid work had less confidence regarding tax matters. In a similar study conducted with university students as respondents, Chardon et al. (2016) found that gender and overall student rank (i.e., Australian Tertiary Admission Rank [ATAR]) predicted the respondents' tax literacy level. Men and students with higher ATAR scores were more tax literate. In terms of self-assessed confidence, men and employed students reported higher confidence in their tax literacy.

Genest-Grégoire, Godbout, and Guay (2017b) measured tax literacy among 1,000 Canadians living in Quebec, targeting both subjective knowledge (i.e., self-assessed knowledge level, tax-reporting behavior, use of media sources for tax information) and objective knowledge (i.e., rates and coverage of consumption taxes, personal income tax progressivity, general functioning of personal income tax). The results showed that age, level of education, and family income were significantly associated with higher tax literacy, as was taxpayers' tendency to fill in tax returns on their own and to update tax knowledge using media sources. The least understood concepts in the survey were personal taxes, consumption taxes, and progressivity.

The importance of tax literacy for tax compliance is gaining ground. In this regard, tax literacy is one lever through which authorities can influence taxpayers' compliance behavior that is ultimately translated into tax revenues, which are fundamental budgetary resources for the majority of governments around the world. In light of this, the concern over identifying efficient strategies to increase tax literacy should be a priority on the agenda of all tax authorities.

Regarding the link between tax literacy and tax compliance, the literature reports mixed results (Pickhardt and Prinz 2014). Nevertheless, numerous researchers include formal knowledge among the individual characteristics that are essential in establishing strategic economic interactions and, ultimately, in determining the degree of compliance by taxpayers (Eriksen and Fallan 1996; Kirchler and Maciejovsky 2001; Lewis 1982; OECD/FIIAPP 2015; Park and Hyun 2003; Schmölders 1960; Zak and Knack 2001). Moreover, the literature reports that tax literacy is one of the sociological factors influencing tax behavior (Brakin 2007; Cvrlje 2015; Djawadi and Fahr 2013; Eriksen and Fallan 1996; Fabian and Johnson 2014; Hofmann, Hoelzl, and Kirchler 2008; Kamaluddin and Madi 2005; OECD/FIIAPP 2015; Palil and Mustapha 2011; Park and Hyun 2003). Tax revenues increase substantially when taxpayers are more knowledgeable about the following: tax laws; tax systems and the main types of obligations;

legal sanctions and penalties; and the importance of public goods financed via taxes for the functioning of society. Tax collection also increases when taxpayers become aware of the negative effects of tax evasion (Djawadi and Fahr 2013; Holler et al. 2008; Palil and Mustapha 2011; Park and Hyun 2003; Richardson 2006; Roth, Scholz, and Witte 1989; Wartick 1994). Furthermore, before making risky financial decisions, taxpayers should be acquainted with their tax obligations and should be capable of assessing the value of their net income. Freudenberg et al. (2017) investigated the tax literacy of small-business owners in direct connection with the goods and services tax (GST), deductions, and compliance attitudes and found that experienced business operators had higher tax literacy scores than other respondents. Although respondents reported overall positive compliance attitudes, the lack of adequate tax knowledge regarding the requested time for maintaining tax records leaves room for unintentional noncompliance.

As previously mentioned, tax literacy is defined by taxpayers' ability to comply with the tax law in force. Taxpayers' understanding of the tax law is an important factor that shapes compliance attitudes. Because tax laws are often complicated, taxpayers can become discouraged in their efforts to fully understand legal precepts. Often, they view tax legislation as a burden because of the cumbersome wording used in legal documents, and they perceive it as a foreign language. Therefore, taxpayers' level of understanding depends on their level of formal education, measured by years of schooling. Numerous studies have demonstrated that educated individuals better understand the significance of tax obligations and the purpose of government policies, and as a consequence, they comply more (Schmölders 1960; Song and Yarbrough 1978; Spicer and Lundstedt 1976).

Tax law complexity, often magnified by multiple changes in tax legislation, creates uncertainty and fear of sanctions. As a consequence, taxpayers hire tax advisors, whose role is to provide professional assistance regarding the correct way to complete tax returns and to support a client's compliance through their conduct (Doran 2009, 161). For instance, in Australia, more than 75% of taxpayers hire tax consultants (Sakurai and Braithwaite 2003), whereas in the US over 60% of taxpayers do so (Blumenthal and Christian 2004). It goes without saying that such a strategy is usually applied by higher-income earners, while lower-income earners can hardly afford it, and they often miss out on benefits (e.g., tax reductions, social welfare, subsidies) provided by government social programs because of low tax literacy (Golombek 2017). This economic reality follows the principles that underline well-known phenomena such as Myrdal's "circular causation" or Merton's "Matthew effect," which explain the affluence of some taxpayers and the poverty of others (Rigney 2010, 46–48).

Sometimes, tax laws are difficult to understand and generate uncertainty, not only among ordinary taxpayers but also among tax authorities. A famous example of this situation goes back more than half a century. Günter Schmölders examined the knowledge of economics among German members of parliament and members of the parliamentary finance committee and concluded that they possessed poor knowledge of tax policy (Kirchler 2007, 6–7). In the same vein, in 1994 Moser analyzed German tax laws from a linguistics standpoint and identified various issues that created difficulty in understanding legal documents, such as abstract wording, excessively long and complex phrases, and the use of abbreviations (Kirchler 2007, 7).

Tax law uncertainty combined with a lack of tax knowledge offers tax authorities a poor environment in which to decide whether taxpayers' behavior is legal and where the line is between legal and illegal in the process of applying legal precepts. Several studies suggest that

a clear delineation of a behavior "according to the law" is extremely difficult to make (Marshall, Armstrong, and Smith 1998; Owens and Hamilton 2004).

Low tax literacy also stems from the inability to understand legal documents. In the opinion of James (1998, 59), the difficulty to interpret tax laws is known as "fiscal fog," and it wanes as the number of years of schooling waxes.[1] Lewis (1982) reported that a high level of education is needed for understanding tax laws. Hence, in 1992, the ordinary taxpayer had only 9 years of schooling, whereas understanding British tax law required 13, comprehending the US law required 12½ years, and grasping Australian law 17 years. According to jurisprudence theory, the tax law has to be "unambiguous" (Bukowski 2011, 7) because tax authorities cannot expect taxpayers to abide by imprecise and unclear law, which not even they understand.

In the context in which tax literacy represents an important lever for increasing tax compliance, one question arises: what type of tax compliance behavior generates higher revenues for state budgets? Is it enforced compliance or voluntary compliance (Kirchler, Hoelzl, and Wahl 2008)?

A vast number of studies (Alm, McClelland, and Schultze 1992a; Alm, McClelland, and Schulze 1992b; Frey and Feld 2002; Graetz and Wilde 1985) list the drawbacks of tax systems based on enforcement. In addition to the fact that intense monitoring of taxpayers' economic activities involves significant financial and temporal resources (i.e., qualified and numerous staff; prolonged periods of tax audits; expenditures regarding the displacement of tax auditors to the headquarters of legal entities; notification of noncompliant taxpayers), an increased level of tax revenues is a temporary achievement. After monitoring ends, many taxpayers can become free riders, thus reducing the likelihood of a future tax audit and reporting nothing to tax authorities, but increasing the likelihood of getting caught not paying taxed owed, assuming strict enforcement.

Considering these aspects and the constraints on national budgets, stimulating voluntary tax compliance seems an adequate alternative from the standpoint of both implied costs and long-term benefits. Moreover, high voluntary tax compliance creates stability for the economic environment and fosters its development by attracting investors. For this reason, raising tax literacy entails multiple benefits for society as a whole because it depends upon voluntary compliance, which has a major impact on the amount of public revenues and the quality of life.

METHOD

Sample Pool

A total of 358 taxpayers[2] age 15 to 64 years (average age 28.09; SD = 10) took part in this study. The majority were women (60.9%), came from urban areas (65.4%), were at least high school graduates (55.9%), were employees (47.8%), worked in industry and commerce (32.7%), relied on a salary as their main source of income (54.2%), and had a gross monthly income of between 975 RON and 2,516 RON (50.6%).[2] The sociodemographic characteristics of the sample pool, detailed based on the main occupational status of participants, are listed in

TABLE 1
Sociodemographic Characteristics of the Sample Pool.

Categories	*Students*	*Employees*	*Employers*	*Self-employed*	*Unemployed*	*Other status (high school student, retiree)*	*Total*
Gender							
Women	79	110	9	13	2	5	218
Men	58	60	6	13	0	2	139
No response	0	1	0	0	0	0	1
Age							
M	21.36	32.66	31.47	27.96	60.5	44.14	28.09
SD	1.49	10.05	7.04	11.66	-	18.83	10
No response	0	11	0	0	0	0	11
Highest level of education completed							
Middle school	0	10	0	1	0	2	13
High school	105	74	6	10	1	4	200
University (bachelor degree)	29	58	8	10	1	1	107
University (master's degree)	3	25	0	3	0	0	31
University (PhD)	0	3	1	2	0	0	6
No response	0	1	0	0	0	0	1
Field of activity							
Public administration	11	17	0	1	0	0	29
Agriculture	1	1	0	2	0	2	6
National defense	0	2	0	0	0	1	3
Education	80	25	0	4	0	0	109
Industry	1	33	2	0	1	0	37
Health care	2	7	0	0	0	0	9
Services and commerce	26	66	13	12	0	0	117
Others	16	20	0	7	1	3	47
No response	0	0	0	0	0	1	1
Gross monthly income							
< 975 RON	93	27	1	7	2	4	134
975–2,516 RON	38	118	8	15	0	2	181
> 2,516 RON	6	26	6	4	0	0	42
No response	0	0	0	0	0	1	1
Main source of income							
Salary	10	166	5	13	0	0	194
Scholarship	20	1	0	1	0	0	22
Guaranteed minimum income, welfare	1	0	0	1	0	1	3
Money received from family	86	3	1	1	0	0	91
Money received from relatives who went abroad, temporarily or definitively	3	0	0	0	0	0	3
Income from investments, savings, or rents	3	0	5	3	0	0	11
Other sources	10	1	4	7	0	5	27
No income	4	0	0	0	2	0	6
No response	0	0	0	0	0	1	1
Participant's area of residence							

(*Continued*)

TABLE 1
(*Continued*)

Categories	*Students*	*Employees*	*Employers*	*Self-employed*	*Unemployed*	*Other status (high school student, retiree)*	*Total*
Rural	43	62	4	9	1	4	123
Urban	94	109	11	17	1	2	234
No response	0	0	0	0	0	1	1

Note: M = mean value, *SD* = standard deviation. The columns were determined according to the six possible answers to the variable "Main occupational status at present." For the possibility "Other status," the only answers indicated were *high school student* and *retiree*. The category "No response" encompasses all observations for which no answer possibility from the ones included in the questionnaire was indicated.

Table 1. The manner in which sociodemographic variables are presented was adapted from Kirchler, Maciejovsky, and Schneider (2005).

Survey Instrument

Motivation for Choosing the Research Instrument

The survey instrument was developed from studies such as ANZ and the Social Research Center (2015), Bumcrot, Lin, and Lusardi (2013), Furnham (2005), Kirchler, Maciejovsky, and Schneider (2005), and Stanculescu (2010).

Compared to other studies that focused exclusively on assessing the level of financial or tax knowledge, this study is based on a complex survey instrument, designed with the purpose of eliciting social representations of taxation, opinions, and compliance attitudes, in addition to the level of tax literacy. The survey instrument includes both subjective and objective measures.

Schmölders (1960, 38) stated that any assessment of taxpayer behavior has to begin with answering this question: "How is the state mirrored in citizens' minds?" The reason is that when taxpayers are aware of the state's role, they build up "civic and tax sentiments" and attitudes regarding public authorities' responsibilities. Following Schmölders' rationale, we believe that assessing the level of tax literacy has to be preceded by an examination of the manner in which basic tax concepts are mirrored in citizens' minds. Identifying these social representations eases understanding of citizens' opinions regarding authorities' actions as well as their attitudes toward abiding by the tax law.

Overall, the survey instrument included 35 items through which we investigated various aspects, including:

- Section 1: social representations of the concepts of "tax," "fiscal fee," and "mandatory social contribution" (3 items)

- Section 2: opinions regarding the public goods system and the tax system (5 items)
- Section 3: tax literacy level (15 items)
- Section 4: tax compliance attitudes and tax morale (12 items).

The demographics section contained eight variables: gender, age, highest level of education completed, occupational status at present, field of activity, gross monthly income, main source of income, area of residence. Regarding the rating of the answers, as some of the items were taken from validated research instruments (e.g., Kogler et al. 2013; Wahl, Kastlunger, and Kirchler 2010), we opted to maintain the nine-point scale throughout the survey for consistency. In addition, we captured more detailed information by offering a wider range of stimuli. In this way, respondents could express both moderate and extreme positions. As Krosnick and Presser (2010) point out in their review, intermediate-length scales are preferable to shorter ones, and data validity is higher for such scales.

The Structure of the Survey Instrument

After presenting instructions on how to complete the survey, section 1 aimed to assess respondents' social representations of the concepts of "tax," "fiscal fee," and "mandatory social contribution"[3] which are the three main types of tax obligations in the Romanian tax system. Hence, respondents were asked to write down all the words they associated with the three concepts (e.g., "List all the words (associations) that come to your mind when thinking about the concept of *tax*").

Section 2 examined respondents' opinions regarding public goods offered by the state, as well as the tax system. Hence, respondents were asked to: (1) indicate the degree of satisfaction related to the quality of public goods provided by the state; (2) assess the level of tax liabilities paid; (3) assess the quality of six goods/services offered by the state; (4) estimate the correspondence between the level of taxes paid and the quality of goods/services offered. For items 1–3, we used a nine-point scale (i.e., 1 = very unsatisfied/very low/very weak; 9 = very satisfied/very high/very strong), and the analysis of internal consistency revealed an acceptable value of Cronbach's alpha coefficient ($\alpha = 0.787$). The last item in the section was an open-ended question allowing respondents to suggest ways in which the quality of goods and services offered by the state could be improved.

Section 3 assessed tax literacy by means of 15 items. The first item was the degree to which respondents had an up-to-date familiarity with the scope of activity of the Romanian Ministry of Public Finances and five agencies that are part of the ministry: the National Agency for Fiscal Administration, the National Commission for Economic Forecasting, the Fiscal Antifraud General Directorate, the General Direction of Customs, and the General Direction of Integrity. For each agency, the response scale employed was dichotomous (yes/no). The following 11 items investigated respondents' theoretical and practical knowledge of basic taxation concepts, such as:

- the institution that establishes tax obligations at the national level (1 item)
- taxonomy of tax obligations (6 items)
- types of tax rates applied to income/profit (1 item)
- simple calculation for determining the value of a good before direct and indirect taxation (2 items)

- benefits generated by fully paying local taxes in advance (1 item).

These 11 items were used to compute the tax literacy index (TLI). Each item had four possible responses, including the option "don't know/don't answer" (Brace 2013, 47), but only one was correct.

By means of the next three items, respondents assessed their level of tax knowledge (i.e., "In your opinion, your tax knowledge … "), indicated the information source they generally used in order to stay up-to-date on Romania's tax system (i.e., "What source of information do you generally use in order to stay up-to-date with the existing tax obligations in Romania?"), and chose from a predefined list a maximum of three agencies that, in their opinion, could provide a tax literacy program.

Section 4 evaluated respondents' tax compliance attitudes. Eleven out of the 12 items have already been validated in the literature, because they were previously used in studies such as Alm and Torgler (2006), Kirchler and Wahl (2010), Wahl, Kastlunger, and Kirchler (2010), and Kogler et al. (2013), on both student and self-employed samples. Namely, items 1–5 measure voluntary compliance ($\alpha = 0.862$) by means of various statements that express different motivations for complying with the payment of tax obligations (e.g., "When I pay my taxes in Romania according to the law, I do this … to support the state and the other citizens"). Item 6 measures enforced compliance. Items 7–11 measure noncompliance ($\alpha = 0.874$) by means of vignettes that indicated different straightforward examples of tax evasion. Respondents had to estimate the likelihood of engaging in tax evasion, assessing each example from the perspective of a business owner (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?"). The last item captures the level of tax morale by indicating the degree to which respondents considered tax evasion unjustified (i.e., "Generally speaking, is cheating on taxes never justified, always justified, or something in between?"). For this section, a nine-point scale was used, from 1 = total disagreement/very improbable/always unjustified to 9 = total agreement/very probable/always justified.

Procedure

The survey instrument was distributed in a paper-based format. Participation was voluntary, and respondents received no monetary incentives. They were recruited on a random basis: employers and the self-employed were surveyed at their offices, employees at their workplaces, and students at Babeş-Bolyai University in Cluj-Napoca, Romania, were approached at the end of class.

Task completion took about 25 minutes. All data were collected in June 2015. Overall, respondents cooperated and answered almost all questions, both open-ended and closed ones. For instance, 97.21% of respondents indicated words/associations regarding the concepts of tax, fiscal fee, and mandatory social contribution, and 58.1% expressed their opinion regarding how to improve the quality of public goods distributed by national and local authorities.

In rural areas, we saw an increased interest in our study, manifested by some of respondents' willingness to disclose even information not solicited by the researchers (e.g., telephone number, first and last name, signature). In our opinion, the desire to disclose their identity could be an effect of their willingness to improve the collection and management of budgetary

revenues. To maintain anonymity in the study, we registered and analyzed only the details specifically solicited in the section "Personal data of respondent."

RESULTS

Descriptive Statistics

In this section, we present the results of our analyses of opinions expressed by respondents in relation to the system of public goods and the tax system.

Overall, respondents indicated discontent regarding the quality of goods provided by the state (M = 3.72; SD = 1.77): 14.8% were completely dissatisfied with these goods, compared with 1.12% who indicated complete satisfaction. Regarding the level of tax obligations in Romania, respondents assessed it as very high (M = 6.82; SD = 1.84). Only 1.68% of respondents assessed the level of taxes, fiscal fees, and mandatory social contributions as very low. The perceived high level of tax obligations could be explained by the fact that labor and consumption are more highly taxed in Romania than in the majority of European Union member countries.

After identifying the respondents' opinions regarding the quality of public goods, we were interested in finding out how respondents evaluated public goods that they frequently used, regardless of the nature of activities performed (i.e., education, health care, social services,

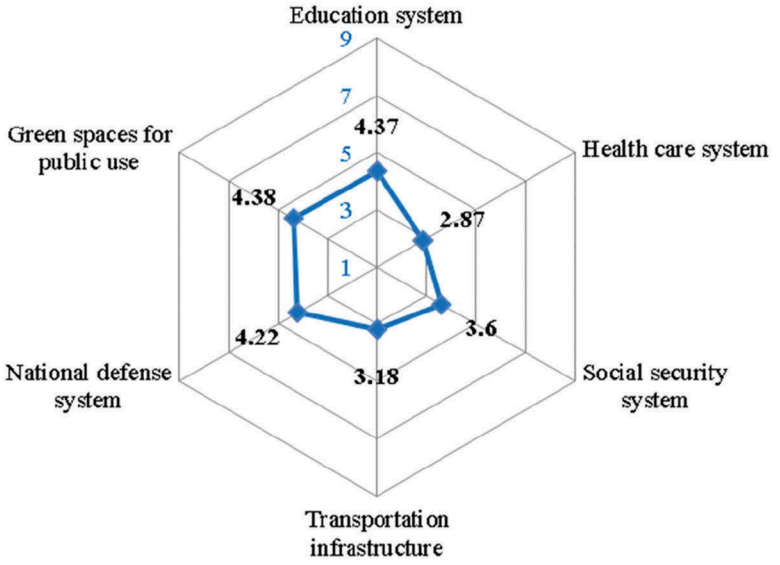

FIGURE 1 Assessing the Quality of Public Goods. *Note*: Numbers in boldface corresponding to each public good indicate average values.Response scale included values ranging from 1 = very weak to 9 = very strong.

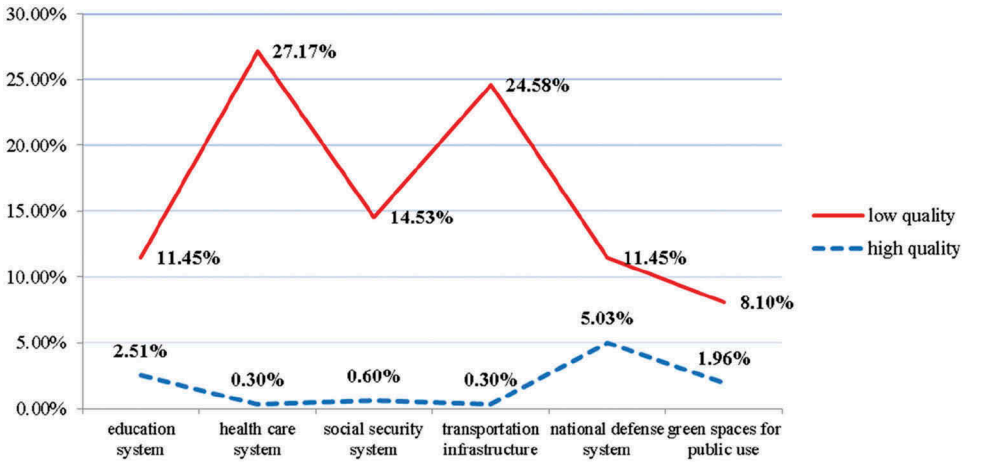

FIGURE 2 Assessing the Quality of Public Goods (Respondents %).

transportation, national defense, green spaces for public use). Figures 1 and 2 illustrate this information.

Figure 1 shows that, according to the overall perception, green spaces for public use have the highest perceived quality, whereas the health care system was perceived as having the lowest quality. Despite the challenges generated by the underfinancing of the education system, respondents credited it as having the second-highest quality.

When considering the percentage of respondents who assessed public goods and the anchors of the response scale (Figure 2), the health care system is again the outlier. More specifically, public health care services were scored negatively by the largest number of respondents (27.17%), compared with only 0.3% who reported an extremely positive assessment of health care services. In addition, the general opinion among respondents was that the level of tax obligations collected by the state exceeded the quality of goods provided (82.12%).

Correspondence Analysis

In this section, we present the results of the corresponding analysis conducted with the help of the statistical software XLSTAT Pro version 7.5 on the words and word associations that respondents offered regarding the concepts of "tax," "fiscal fee," and "mandatory social contribution." The importance of correspondence analysis is that it investigates whether respondents differentiated among the three concepts. A different outcome would imply overlapping concepts and possible confusion among the three terms, which are not interchangeable.

Overall, respondents indicated 2,529 words and word associations. The details according to demographics are in Appendix 1. The concept of "tax" generated 1,030 words and word associations, of which 173 were different; 41.9% of respondents mentioned the words "fiscal fee" and 3.07% "mandatory social contribution." The concept of "fiscal fee" generated 795 words and word associations, of which 206 were different; 8.66% of respondents mentioned the word "tax" and 1.68% "mandatory social contribution." The concept of "mandatory social

contribution" generated 704 words and word associations, of which 164 were different. Moreover, 7.54% of respondents mentioned the word "tax" and 13.13% "fiscal fee."

Following Kirchler, Maciejovsky, and Schneider (2005) and Stark et al. (2016), we divided the 2,529 words and word associations into 16 categories based on term similarity. Frequencies detailed according to categories and concepts are in Appendix 2. As a first step in the correspondence analysis, we created a contingency table by including the frequency of words and word associations corresponding to each category (Appendix 3). Table rows represented the 16 categories and the columns the three concepts. After testing the independence of rows and columns, we concluded that they had significant dependence ($\chi^2 = 398.51$; $p < .001$), and the total value of the variance (in our case, inertia) was 0.158.

Like principal component analysis, correspondence analysis implies a determination of the number of dimensions along which associations between rows and columns are identified, based on own value and percentage of inertia. Hence, dimension 1 explains 76.41% of inertia, while dimension 2 explains 23.59%. In other words, according to Figure 3, the two dimensions are sufficient to explain total inertia (100%).

Moreover, Table 2 shows the contribution of each row (i.e., category) to the creation of dimensions.

In our case, the row contribution is regarded as significant if its distribution exceeds the value of 100/16 = 6.25%. As shown in the matrix, dimension 1 is determined mainly by categories 1, 2, 5, 8, and 9. Dimension 2 is determined by categories 11 and 13. Although, from a theoretical perspective, categories 5 and 9 exceed 6.25%, they do not determine dimension 2. The categories have a lower value of associations with dimension 2 than with dimension 1 (see Appendix 3).

Table 3 shows the contribution of each column (i.e., concepts) to the creation of dimensions.

In our case, the column contribution is regarded as significant if its distribution exceeds 100/3 = 33.33%. As seen in the matrix, dimension 1 is determined by the concepts of "fiscal fee" and "mandatory social contribution." Dimension 2 is determined by the concept of "tax."

Figure 4 shows the overall results of the correspondence analysis, which indicate that respondents discriminated between the three concepts, as expected. Because these are basic

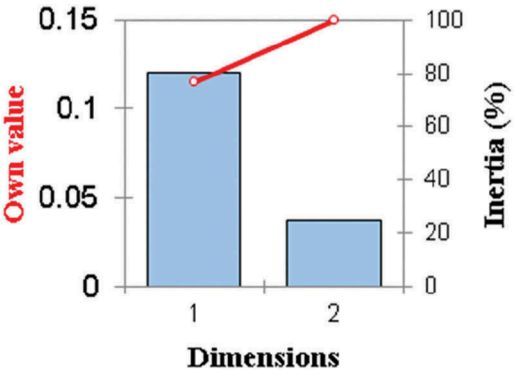

FIGURE 3 Confirmation of an Adequate Number of Dimensions through a Scree Plot.

TABLE 2
Row Contribution to Dimension Creation.

Category	*Weight (relative)*	*D1*	*D2*
1	0.363	**0.347**	0.002
2	0.144	**0.071**	0.042
3	0.080	0.002	0.016
4	0.039	0.000	0.006
5	0.026	**0.084**	0.197
6	0.069	0.035	0.002
7	0.070	0.017	0.053
8	0.048	**0.169**	0.009
9	0.031	**0.233**	0.206
10	0.015	0.001	0.000
11	0.037	0.000	**0.257**
12	0.017	0.015	0.039
13	0.025	0.005	**0.131**
14	0.020	0.008	0.008
15	0.007	0.007	0.024
16	0.009	0.006	0.008

Note: D1 is the dimension corresponding to the *x*-axis, while D2 is the dimension corresponding to the *y*-axis.
Values indicated under each dimension represent category distribution on axes.

TABLE 3
Column Contribution to Dimension Creation.

Concept	*Weight (relative)*	*D1*	*D2*
Tax	0.407	0.012	**0.581**
Fiscal fee	0.314	**0.553**	0.132
Mandatory social contribution	0.278	**0.435**	0.286

Note: D1 is the dimension corresponding to the *x*-axis, while D2 is the dimension corresponding to the *y*-axis.
Values indicated under each dimension represent category distribution on axes.

concepts in the Romanian tax system, this outcome represents a favorable starting point for building a strong tax literacy level. Categories such as "time," "positive emotions and characteristics," "negative economic consequences," or "banking sector" were associated with the concept of tax. The concept of fiscal fee was associated with "administration and bureaucracy," "taxable goods," "divisions," and "negative emotions and characteristics." "Mandatory social contribution" was associated with categories such as "social environment" or "positive economic consequences."

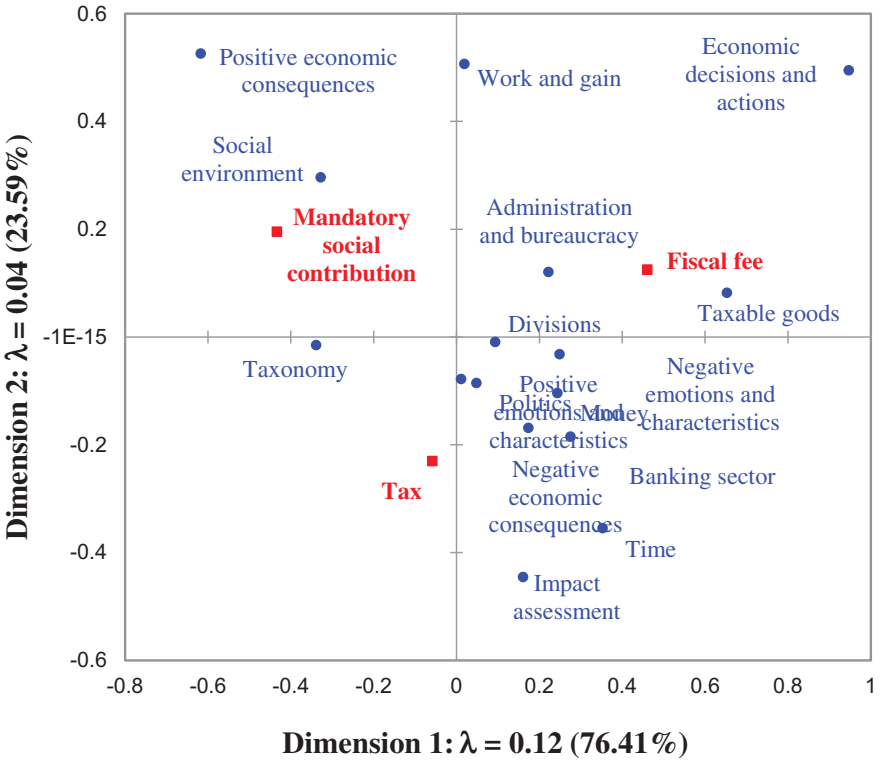

FIGURE 4 Correspondence Analysis Results (Symmetric Graphical Representation). *Note*: Squares represent the columns of the contingency table, dots represent the rows of the contingency table. Own value of each dimension is denoted by λ. Inertia value is indicated in parentheses for each dimension.

Analysis of Words and Word Associations Generated by the Concepts of "Tax" (T), "Fiscal Fee" (FF), and "Mandatory Social Contribution" (MSC) with Polarity and Neutrality Indices

The 2,529 words and word associations mentioned by respondents were also analyzed by computing polarity and neutrality indices (de Rosa 1995) to elicit social representations. The polarity index (PI) determines the weight of the differences between positive and negative associations in the total number of associations generated for a particular concept, and it can register values in the interval [–1, +1]. The neutrality index (NI) determines the weight of neutral associations in the total number of associations generated for a particular concept, and it can register values in the interval [0, 1].

We computed the polarity index for each concept (Appendix 4). Overall, average values (PI_T = –0.21; PI_{FF} = –0.20; PI_{MSC} = –0.12) are in the interval [–0.4; +0.4], meaning that

respondents generated a relatively equal number of positive and negative associations (de Rosa 2002, 185).

The neutrality index results are in Appendix 5. Its average values ($NI_T = 0.79$; $NI_{FF} = 0.85$; $NI_{MSC} = 0.86$) are very close to the upper limit of the interval [0, 1]—meaning that the majority of words indicated by respondents have a neutral connotation.

Assessing the Level of Tax Literacy: The Tax Literacy Index

As previously mentioned, the survey section assessing the level of tax literacy contains 15 items. With the first item in this section, we investigated respondents' degree of familiarity with the scope of activity of six Romanian public institutions in the tax system (see Table 4).

Table 4 shows that the majority of respondents consider themselves familiar with the scope of activity of the Ministry of Public Finance, the National Agency of Tax Administration (ANAF), and the Fiscal Antifraud General Directorate.

TABLE 4
Respondents' Degree of Familiarity with the Activity Scope of Romanian Public Institutions (Item 1).

Item	*Familiar*	*Not familiar*
PI1. Ministry of Public Finance	68.4%	31.6%
PI2. National Agency for Fiscal Administration (ANAF)	73.5%	26.5%
PI3. National Commission for Economic Forecasting	21.2%	78.8%
PI4. Fiscal Antifraud General Directorate	62.3%	37.7%
PI5. General Direction of Customs	44.4%	55.6%
PI6. General Direction of Integrity	22.1%	77.9%

Note: Values show the percentage of respondents who were familiar or unfamiliar with the item.

TABLE 5
Answers Indicated by Subjects for Items 2–12.

Items	*Correct*	*Incorrect*
TLI2. Responsibility for establishing tax obligations	66.2%	33.8%
TLI3. Taxonomy of tax obligations	71.5%	28.5%
TLI4. Conceptual differences between fiscal fee and tax	52.2%	47.8%
TLI5. Personal income tax	71.2%	28.8%
TLI6. VAT	11.2%	88.8%
TLI7. Income/profit tax rates	49.4%	50.6%
TLI8. Determining the gross value of a prize earned	64.5%	35.5%
TLI9. Entity paying the VAT	84.6%	15.4%
TLI10. Determining price net of VAT	14.8%	85.2%
TLI11. Benefits of paying local taxes in advance	56.4%	43.6%
TLI12. The role of excise taxes	80.2%	19.8%

Note: Values show the percentage of respondents who answered the 11 items correctly and incorrectly.

Items 2–12 assessed respondents' theoretical and practical knowledge regarding elementary taxation concepts. Each item had four possible responses (including "don't know"/"don't answer"), with only one correct. Based on these 11 items, we built a tax literacy index with values from 0 (no correct answer) to 1 (all correct answers) (See Table 5).

Overall, the level of tax literacy was moderate ($M = 0.57$; $SD = 0.19$). The details on tax literacy scores according to sociodemographic characteristics are in Appendix 6. Our results showed that men ($M = 0.58$, $SD = 0.18$), employers ($M = 0.65$, $SD = 0.14$), moderate-income earners ($M = 0.59$, $SD = 0.19$), and respondents living in urban areas ($M = 0.57$, $SD = 0.19$) had higher knowledge and skills in tax matters than other respondents from the corresponding sociodemographic categories. As expected, tax literacy scores increased with the number of years of schooling, with PhD holders registering the highest scores ($M = 0.79$, $SD = 0.09$).

Both theoretical and practical items created problems for respondents. A little over half the respondents stated that there were major differences between the concepts of "tax" and "fiscal fee." More than half the respondents were not up-to-date on the income/profit tax rates. By far, consumption taxation registered the fewest correct answers: only 11.2% of the respondents knew that the VAT is in the tax category, and only 14.8% of them correctly determined the price of a product not including the VAT. Regarding the item "In your opinion, the tax knowledge level you possess is," respondents evaluated themselves as possessing a moderate tax knowledge level ($M = 4.16$; $SD = 1.94$).

Assessing the Relationship between the Tax Literacy Index and Voluntary Tax Compliance

To assess the relationship between the tax literacy index and voluntary tax compliance, we investigated the existence of a moderation effect with the software IBM SPSS Statistics version 20 and the add-on PROCESS developed by Hayes (2013).

Moderation is generally used in the field of social sciences to emphasize the conditions in which an independent variable determines changes in a dependent variable (Frazier, Tix, and Barron 2004, 116; Hayes 2013, 21; Hayes and Rockwood 2017). Such conditions are indicated by a variable called a moderator. According to Baron and Kenny (1986, 1174), the moderator is a "qualitative variable (e.g., gender, race, class) or quantitative (e.g., reward level) that influences the direction and/or the intensity of the relationship between the independent variable or predictor and the dependent variable or criterion."

Moderation occurs only when the interaction between the predictor and the proposed moderator is significant. The phenomenon can be probed using simple slopes analysis, which investigates the predictor-criterion relationship at different levels of the moderator (Frazier, Tix, and Barron 2004, 122). In the case of continuous moderators, the Johnson-Neyman technique is also used to determine the so-called regions of significance, where the predictor-criterion relationship is significant.

The existence of the moderation effect can be investigated using analysis of variance (Baron and Kenny 1986), structural equation modeling (Jaccard and Wan 1995), or multiple regressions (Hayes and Agler 2014). For our study, we chose multiple regression, and we hypothesized that the relationship between our tax literacy index and voluntary tax compliance would be significant in the presence of the moderator neutrality index of the concept "mandatory social contribution" (NI_{MSC}).

We have three motivations for choosing a moderator among the neutrality indices. First, the majority of words and word associations produced by respondents concerning tax obligations had a neutral connotation. That is, the three concepts were represented in respondents' minds mainly through their core characteristics, economic functions, and role in the development of society. But, in the case of all polarity indices, respondents' social representations of tax obligations were equally divided between positive and negative. We believe that the prevalence of neutral representations implies increased awareness of the importance of tax obligations. For this reason, in the process of improving voluntary compliance levels, solid tax literacy should be paired with a deep understanding of why tax obligations are necessary. Second, of the three neutrality indices, we selected NI_{MSC} because it had the highest score, presumably due to its close connection with transfer payments such as social security, health care, unemployment benefits, or welfare. Third, social representations are among the factors that influence tax compliance decisions (Kirchler 2007; Kirchler, Maciejovsky, and Schneider 2005).

In line with the tax behavior literature (Alm and Torgler 2006; Kirchler 2007), we also took into consideration variables such as gender, age, the level of education completed (with middle school as baseline), income, and tax morale.

The regression equation is as follows:

$$\begin{aligned} VC_i = {} & b_0 + b_1 \times TLI_i + b_2 \times NI_{MSCi} + b_3 \times TLI_i \times NI_{MSCi} \\ & + b_4 \times G_i + b_5 \times A_i + b_6 \times HS_i + b_7 \times UB_i + b_8 \times GM_i \\ & + b_9 \times GPHD_i + b_{10} \times I_i + b_{11} \times TM_i + \varepsilon_i \end{aligned}$$

where

- *VC* is the dependent variable, i.e., voluntary compliance
- *TLI* is the independent variable, i.e., tax literacy index
- NI_{MSC} is the moderator, i.e., neutrality index for the concept of "mandatory social contribution"
- *TLI x* NI_{MSC} is the first-order interaction term, i.e., product between the independent variable and the moderator
- *G* is gender (0 = woman, 1 = man)
- *A* is age (in years)
- *HS* is high school education (0 = not completed; 1 = completed)
- *UB* is undergraduate bachelor degree (0 = not completed; 1 = completed)
- *GM* is master's degree (0 = not completed; 1 = completed)
- *GPHD* is PhD (0 = not completed; 1 = completed)
- *I* is gross monthly income (in RON)
- *TM* is tax morale (from 1 = very high to 9 = very low)
- ε is the error term.

In running the regression model, we estimated confidence intervals with BCA bootstrapping (i.e., 95% BCA confidence intervals; 1,000 bootstraps), a method that stems from classical bootstrapping (Efron 1979). The BCA bootstrapping method is widely used in the literature, and it is acknowledged for correcting confidence intervals with respect to variance nonnormality, acceleration, and bias (Efron and Hastie 2016).

The results from the regression analysis are displayed in Table 6.

TABLE 6
Regression Analysis Results.

					95% confidence interval	
	B	*SE*	*t*	*p*	*LLCI*	*ULCI*
Intercept	5.42	2.20	2.46	0.015	1.08	9.77
TLI	0.63	0.77	0.82	0.415	–0.89	2.17
NI_{MSC}	–0.17	0.59	–0.28	0.780	–1.33	0.99
Interaction	8.17*	3.42	2.39	0.018	1.43	14.91
G	0.29	0.27	1.08	0.280	–0.24	0.83
A	0.03	0.02	1.74	0.083	–0.01	0.06
HS	–0.93	2.13	–0.44	0.661	–5.13	3.26
UB	–0.47	2.13	–0.22	0.824	–4.67	3.72
GM	–0.44	2.16	–0.20	0.837	–4.70	3.82
GPHD	–1.26	2.40	–0.53	0.599	–5.99	3.47
I	0.14	0.21	0.68	0.494	–0.26	0.53
TM	–0.06	0.06	–1.03	0.310	–0.18	0.06
R = 0.351	R squared = 0.124					

Note: $N = 229$; *$p < 0.05$; LLCI = lower limit of confidence interval; ULCI = upper limit of confidence interval.When the 95% confidence interval includes zero, the effect is considered nonsignificant.

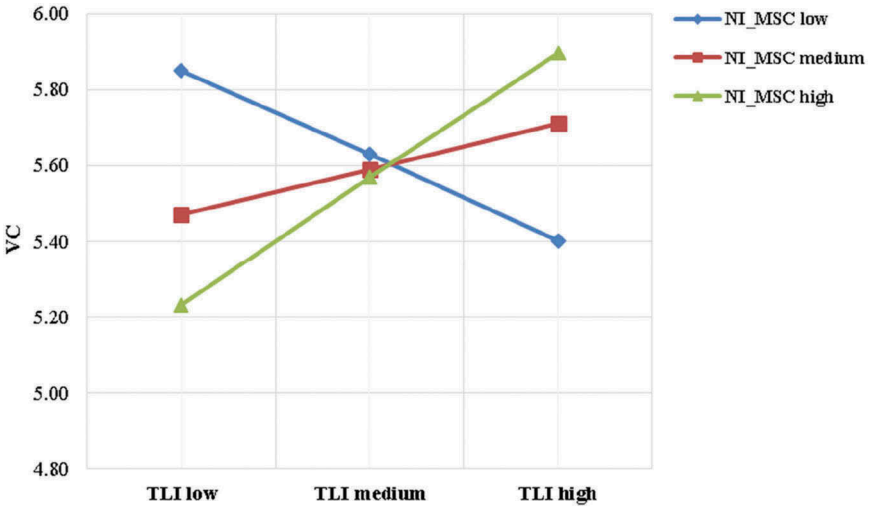

FIGURE 5 Simple Slopes Analysis of the Relationship between Tax Literacy Index and Voluntary Compliance, Moderated by the Neutrality Index for the Concept of "Mandatory Social Contribution".

Table 6 shows that a significant interaction effect was identified between our predictor and designated moderator, $b = 8.17$, $t = 2.39$, $p < .05$. Hence, it means that a moderation phenomenon did occur. Variables such as gender ($b = 0.29$, $t = 1.08$, $p = .280$), age ($b = 0.03$, $t = 1.74$, $p = .08$), high school education completed ($b = –0.93$, $t = –0.44$, $p = .661$),

bachelor degree (b = –0.47, t = –0.22, p = .824), master's degree (b = –0.44, t = –0.20, p = .837), PhD (b = –1.26, t = –0.53, p = .599), income (b = 0.14, t = 0.68, p = .494), and tax morale (b = –0.06, t = –1.03, p = .310) had no influence on the willingness to pay taxes.

We conclude from probing the moderation effect with simple slopes analysis that: (1) when NI_{MSC} is low, TLI and VC have no significant relationship (b = –1.20, 95% CI [–3.43; 1.02], t = –1.07, p = .288); (2) when NI_{MSC} is at a medium level, TLI and VC have no significant relationship (b = 0.63, 95% CI [–0.89; 2.17], t = 0.82, p = .415); and (3) when NI_{MSC} is high, TLI and VC have a strong significant relationship (b = 1.77, 95% CI [0.03; 3.52], t = 2.00, p < .05). Figure 5 shows that the moderator strengthened the relationship between TLI and VC.

As the values of the moderator increased, the relationship tax literacy–voluntary compliance changed from negative and statistically nonsignificant to positive and statistically significant. More precisely, when respondents had neutral associations regarding tax obligations, a higher tax literacy level was linked to higher voluntary compliance (i.e., line with arrows).

Because the chosen moderator was continuous, the moderation effect was also investigated with the Johnson-Neyman technique. The region of statistical significance was defined by a single value, 0.134. Hence, the relationship between tax literacy and voluntary compliance was statistically significant for every value of the moderator above 0.134. After the moderator fell below this threshold, the relationship was nonsignificant. The effect size showed that it changed from negative (b = –4.35) to positively significant (b = 1.77). Therefore, the Johnson-Neyman technique reinforced the results from the simple slopes analysis.

DISCUSSION AND CONCLUSIONS

To study the impact of tax literacy on tax compliance, we surveyed 358 Romanian taxpayers on theoretical and practical aspects regarding the national tax system (i.e., social representations of taxation concepts; quality assessment of public goods system; tax literacy level; tax compliance attitudes). First, we investigated the 2,529 words and word associations triggered by three taxation concepts with correspondence analysis, polarity indices, and neutrality indices. Second, we measured respondents' level of tax literacy with an 11-item index. Third, we analyzed the link between tax literacy and compliance via moderation (Hayes 2013), estimating confidence intervals with bias-corrected and accelerated bootstrapping.

To begin with, our results showed that participants differentiated between the concepts of "tax," "fiscal fee," and "mandatory social contribution." This first finding is very important because tax obligations represent the backbone of the national tax system. Therefore, these taxpayers can attain strong tax literacy because the majority clearly do not overlap concepts. Furthermore, polarity and neutrality indices showed that these concepts triggered a relatively equal number of positive and negative associations, with the majority of words having neutral connotations. This second finding is also important because taxpayers who have balanced social representations of the tax system and understand its functioning mechanism in direct connection with social advancement can achieve strong tax literacy. In addition, we found that respondents had a moderate tax literacy, which corresponded to their self-assessments. In line with the literature (Genest-Grégoire, Godbout, and Guay 2016, 2017b), respondents' knowledge was the lowest regarding the taxation of consumption, income, and profit.

Our main finding is that the impact of tax literacy on tax compliance was significant. Namely, the investigation of the moderating effect with regression analysis indicated that when respondents generated more neutral social representations of taxation concepts, higher tax literacy was directly connected to higher voluntary compliance than when respondents generated less neutral representations. In our opinion, the neutrality of social representations suggests that respondents were highly aware of the role that taxation plays in society, and consequently it triggered a propensity toward taxpaying. The economic relevance of this finding is that tax revenues can be high when taxpayers are literate and aware of taxation matters. In this context, tax authorities could save considerable financial resources by focusing more on providing public goods than on constantly monitoring noncompliance. Variables such as gender, age, level of education completed, income, and tax morale did not influence the willingness to pay taxes.

We also surveyed respondents on the information sources they regularly used to update their knowledge of tax obligations in Romania. Thus, 12.85% reported using the tax code, 72.07% used mass media (TV, radio, newspapers, internet), 8.94% asked friends and acquaintances, and 6.14% did not disclose this information. In addition, the National Agency of Tax Administration, along with primary, secondary and tertiary educational institutions were considered the most appropriate for offering basic information on taxation.

Higher tax literacy has numerous benefits, other than the financing of public goods through voluntary compliance. In the case of individuals, literate taxpayers grasp the purpose of taxation and are willing to pay their fair share. Such taxpayers have the ability to evaluate their eligibility for government programs and to request available benefits (Genest-Grégoire, Godbout, and Guay 2017b, 2; Golombek 2017). By contrast, low tax literacy reduces the effectiveness of income redistribution programs and affects those who cannot easily counterbalance their tax knowledge gap. In the case of employers and the self-employed (Freudenberg et al. 2017), a literate taxpayer takes a proactive approach to upgrading tax knowledge and skills, either through personal efforts or with the help of a professional tax advisor. Hence, such taxpayers substantially lower noncompliance risks and costs associated with taxpaying (i.e., pecuniary and/or legal sanctions; loss of time because of red tape; stress).

Our study is subject to some limitations because we estimated tax literacy considering basic taxation concepts and principles. Thus, subsequent extensions of the survey instrument might include more complex items regarding some of the issues addressed. Nonetheless, it is essential for taxpayers to have a clear understanding of basic taxation concepts, which is a starting point in developing a tax literate citizenry. Second, future studies investigating the impact of tax literacy on tax compliance could integrate other variables suggested in the literature, such as trust in government, tax culture, or enforced tax compliance (Kirchler 2007), which are not addressed in our study. Third, compared to the population structure reported in the *Romanian Statistical Yearbook* (National Institute of Statistics, 2017), our sample has a higher percentage of women, urban dwellers, and employees, and is better educated than the general population. Regarding possible avenues for future research, our survey instrument could be standardized and applied so as to capture the features of comparable or distinct tax systems around the world.

In terms of strategies to increase tax literacy, we have various recommendations. First, tax administrations could constantly update citizens on their rights and responsibilities, potential tax benefits, tax-reporting deadlines, major changes in tax rates, and recent amendments to tax

legislation through official websites, media campaigns, educational programs, publications, training, and free counseling sessions offered by tax advisors. Second, the level of tax literacy could be monitored via occasional online surveys, which might signal potential misunderstanding or difficulty. Third, authorities could reconsider the nature of the interaction with taxpayers by respecting their needs, correctly applying the law, increasing the transparency of public outlays, and, at the same time, making larger investments in training civil servants who will subsequently facilitate the compliance process. Regarding the last of these recommendations, the Romanian Tax Administration has made some important advances. Hence, through the project "Developing a Viable Partnership between the National Agency of Fiscal Administration and the Direct Beneficiaries of the Services Provided by It: A Premise for Streamlining the System of Collecting Public Revenues" (code SMIS 31224), 382 Romanian civil servants were trained in communication techniques to improve interactions with taxpayers. The project "A Useful and Polite Tax Authority" does the same. The project has been implemented by the Association for Reforming the Tax System and has been designed as a national competition among local tax administrations to improve the quality of tax services. In our view, turning these projects into permanent practice and extending them to every local tax authority could positively influence compliance. Last but not least, tax administrations could develop long-term collaborations with formal educational institutions (OECD/FIIAPP 2015) aimed at instructing future taxpayers.

ACKNOWLEDGMENTS

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DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

Notes

1. According to James (1998, 59), the original English expression is "fiscal fog," FOG being the acronym for "frequency of gobbledygook."
2. As stipulated in article 1, paragraph 4, of the Romanian Tax Procedure Code (2014), "taxpayers" are "all individuals, legal persons, or any other entity without legal personality that owes, according to the law, taxes and social contributions". All respondents in this study are taxpayers by virtue of owing taxes based on their having generated income (i.e., employees or employers) and as consumers of goods and services. An "employee" is any economically active individual who works for an employer (individual or corporate) under an employment contract and is entitled to receive a salary for the work performed. RON = Romanian new leu. We designed the income brackets to include the gross minimum wage (975 RON) and the gross median wage (2,516 RON) according to the Romanian legislation in effect in June 2015. The estimated exchange rate in June 2015 was 1 RON = 0.249 USD.

3. We investigated respondents' social representations of "tax," "fiscal fee," and "mandatory social contribution" because these concepts often create confusion in taxpayers' minds; that is, each one is confounded with the others, or all three tax obligations are included in the "tax" category. Within the framework of the Romanian tax system, taxes are revenues levied by state authorities on income, wealth, and consumption, followed by no immediate counterpart from the state and with no destination established before collection (e.g., individual and corporate income tax; property tax; VAT). Fiscal fees are revenues obtained by state authorities in exchange for an immediate public institutional service provided to taxpayers (e.g., vehicle registration fee; passport fee; highway tolls). Mandatory social contributions are revenues levied by state authorities that have a clear destination established before collection, namely, the financing of public outlays for community interest or social purposes (e.g., social security, health care, unemployment). In our opinion, a tax literate citizen should be able to clearly differentiate among these concepts.

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APPENDIX 1
Number of Words (Associations) Indicated by Respondents Depending on the Concepts and Demographics.

	Tax				*Fiscal fee*				*Mandatory social contribution*			
Words (associations)	*N*	*M*	*SD*	*Md*	*N*	*M*	*SD*	*Md*	*N*	*M*	*SD*	*Md*
Total words (associations)	**1,030**	**2.89**	**1.85**	**3**	**795**	**2.22**	**1.42**	**2**	**704**	**1.97**	**1.40**	**1**
Different words (associations)	**173**				**206**				**164**			
Gender												
Women	626	2.87	1.88	3	464	2.13	1.44	1	431	1.98	1.43	1
Men	400	2.88	1.81	3	328	2.36	1.38	2	273	1.96	1.35	1
Highest level of education completed												
Middle school	17	1.31	0.75	1	17	1.31	0.75	1	12	0.92	0.95	1
High school	545	2.73	1.66	3	422	2.11	1.41	2	360	1.80	1.26	2
University (bachelor degree)	335	3.13	2.07	3	259	2.41	1.47	2	240	2.24	1.58	1
University (master's degree)	99	3.19	2.02	2	78	2.52	1.29	2	73	2.35	1.43	1
University (PhD)	30	5	1.79	4	17	2.83	1.60	4	19	3.17	1.17	3
Main occupational status at present												
Student	407	2.97	1.81	3	312	2.28	1.34	2	267	1.95	1.30	2
Employee	482	2.82	1.84	3	371	2.17	1.39	1	322	1.88	1.32	1
Employer	40	2.67	1.18	2	34	2.27	1.33	3	34	2.27	1.33	3
Self-employed	83	3.19	2.21	5	65	2.50	1.58	2	70	2.69	2.17	1
Unemployed	2	2	0	2	2	2	0	2	2	1	0	1
Other status	16	2.29	2.69	1	11	1.57	2.88	1	9	1.29	1.50	2
Field of activity												
Public administration	77	2.66	2.16	1	59	2.03	2.01	2	54	1.86	1.30	1
Agriculture	21	3.5	1.97	5	13	2.17	1.47	3	13	2.17	1.94	1
National defense	14	4.67	3.06	2	13	4.33	3.21	8	7	2.33	2.08	3
Education	311	2.85	1.68	3	238	2.18	1.08	2	188	1.72	1.10	2
Industry	103	2.78	2.02	1	80	2.16	1.56	1	67	1.81	1.52	1
Health care	17	1.89	1.05	2	19	2.11	1.36	1	14	1.56	0.53	2
Services and commerce	352	3.01	1.94	3	273	2.33	1.49	1	261	2.23	1.60	1
Other	132	2.81	1.66	3	100	2.13	1.23	2	98	2.09	1.44	2
Gross monthly income												
< 975 RON	368	2.75	1.74	2	281	2.10	1.09	2	245	1.83	1.29	1
975–2,516 RON	528	2.92	1.77	3	397	2.19	1.61	1	370	2.04	1.48	2
> 2,516 RON	131	3.12	2.47	3	117	2.79	1.34	2	87	2.07	1.44	2
Main income source												
Salary	549	2.83	1.87	3	429	2.21	1.43	1	382	1.97	1.47	1
Scholarship	66	3	1.69	3	41	1.86	0.99	1	47	2.14	1.42	3
Guaranteed minimum income, welfare	9	3	2.65	4	6	2.00	2.00	2	5	1.67	2.08	1
Money received from family	271	2.98	1.77	3	208	2.29	1.07	2	172	1.89	1.22	2
Money received from relatives living abroad temporarily or permanently	17	5.67	4.73	4	15	5.00	5.20	2	7	2.33	0.58	2
Income from investments, savings, or rents	34	3.09	1.45	4	30	2.73	1.10	3	31	2.82	1.60	2
Other sources	70	2.59	1.8	1	57	2.11	1.76	1	52	1.93	1.33	2
No income	11	1.83	0.98	1	9	1.50	1.22	1	6	1	1.55	1
Participant's area of residence												
Rural	344	2.8	1.76	3	257	2.09	1.48	2	195	1.59	1.08	1
Urban	683	2.92	1.9	3	538	2.30	1.38	2	507	2.17	1.51	2

Note: *M* = average value; *SD* = standard deviation; *Md* = modal value. The structure of the table was adapted after Stark et al. (2016).

APPENDIX 2
Grouping of Words (Associations) in Categories according to the Concepts of "Tax," "Fiscal Fee," "Mandatory Social Contribution."

Stimuli Categories	*Tax Words (associations)*	*Fiscal fee Words (associations)*	*Mandatory social contribution Words (associations)*
Taxonomy of taxes/fiscal fees/mandatory social contributions	402	156	360
Money	161	144	60
Politics	90	64	48
Positive emotions and characteristics	44	30	25
Positive economics consequences	13	11	43
Negative emotions and characteristics	71	72	32
Negative economic consequences	84	62	30
Taxable goods	39	73	9
Economics decisions and actions	8	64	7
Divisions	15	13	9
Work and gain	15	40	39
Social environment	12	10	20
Assessment of mandatory social contribution impact	38	18	6
Administration and bureaucracy	17	22	12
Time	10	7	1
Banking sector	11	9	3
TOTAL	**1,030**	**795**	**704**

Note: Only words (associations) mentioned by minimum three respondents were considered. Categories were created by grouping words (associations) in terms of similarity. Table structure was adapted after Kirchler, Maciejovsky, and Schneider (2005) and Stark et al. (2016).

APPENDIX 3
The Value of Associations between Created Categories and the Two Dimensions.

Categories	*D1*	*D2*
Taxonomy	0.998	0.002
Money	0.845	0.155
Politics	0.238	0.762
Positive emotions and characteristics	0.020	0.980
Positive economic consequences	**0.580**	**0.420**
Negative emotions and characteristics	0.984	0.016
Negative economic consequences	0.514	0.486
Taxable goods	0.984	0.016
Economic decisions and actions	**0.785**	**0.215**
Divisions	0.990	0.010
Work and gain	0.001	0.999
Social environment	0.550	0.450
Assessment of mandatory social contribution impact	0.115	0.885
Administration and bureaucracy	0.772	0.228
Time	0.497	0.503
Banking sector	0.689	0.311

Note: Numbers represent the squared cosinus of the value of associations.

APPENDIX 4
Polarity Indices Detailed according to Concepts and Demographics.

	Tax		*Fiscal fee*		*Mandatory social contribution*	
Indices	*M*	*SD*	*M*	*SD*	*M*	*SD*
Overall polarity index	**–0.21**	**0.37**	**–0.20**	**0.39**	**–0.12**	**0.50**
Polarity index according to gender						
Women	–0.22	0.37	–0.22	0.37	–0.14	0.49
Men	–0.20	0.37	–0.19	0.43	–0.09	0.51
Polarity index according to the highest level of education completed						
Middle school	–0.17	0.39	–0.08	0.29	–0.38	0.52
High school	–0.22	0.38	–0.21	0.40	–0.16	0.51
University (bachelor degree)	–0.20	0.36	–0.22	0.41	–0.08	0.46
University (master's degree)	–0.24	0.36	–0.18	0.36	–0.05	0.49
University (PhD)	–0.10	0.28	–0.05	0.11	0.08	0.49
Polarity index according to the main occupational status at present						
Student	–0.18	0.30	–0.23	0.40	–0.12	0.43
Employee	–0.23	0.41	–0.18	0.39	–0.12	0.55
Employer	–0.29	0.42	–0.26	0.37	–0.14	0.30
Self-employed	–0.18	0.40	–0.22	0.40	–0.05	0.47
Unemployed	-	-	-	-	–1	0
Other status	–0.32	0.36	–0.19	0.38	–0.19	0.55
Polarity index according to the field of activity						
Public administration	–0.32	0.39	–0.26	0.37	–0.22	0.49
Agriculture	–0.23	0.30	–0.18	0.29	–0.30	0.45
National defense	–0.25	0.43	–0.25	0.43	0.13	0.18
Education	–0.17	0.33	–0.19	0.36	–0.13	0.46
Industry	–0.27	0.42	–0.15	0.34	–0.21	0.57
Health care	–0.35	0.58	–0.41	0.55	–0.44	0.53
Services and commerce	–0.19	0.38	–0.19	0.41	–0.06	0.48
Other	–0.20	0.33	–0.25	0.45	–0.07	0.57
Polarity index according to the gross monthly income						
< 975 RON	–0.17	0.31	–0.16	0.33	–0.13	0.45
975–2,516 RON	–0.22	0.40	–0.22	0.44	–0.09	0.52
> 2,516 RON	–0.27	0.40	–0.30	0.38	0.21	0.51
Polarity index according to the main source of income						
Salary	–0.23	0.41	–0.20	0.40	–0.14	0.55
Scholarship	–0.22	0.29	–0.31	0.44	–0.10	0.46
Guaranteed minimum income, welfare	–0.20	0.28	0	0	0	0
Money received from family	–0.16	0.30	–0.21	0.39	–0.12	0.45
Money received from relatives living abroad temporarily or permanently	–0.27	0.27	–0.68	0.28	–0.11	0.19
Income from investments, savings, or rents	–0.26	0.34	–0.33	0.37	–0.07	0.16
Other sources	–0.28	0.39	–0.10	0.31	0	0.41
No income	–0.06	0.14	0.07	0.15	–0.67	0.58
Polarity index according to participant's area of residence						
Rural	–0.18	0.32	–0.15	0.34	–0.16	0.49
Urban	–0.23	0.39	–0.24	0.42	–0.10	0.50

Note: *M* = average value; *SD* = standard deviation. Table structure was adapted after Stark et al. (2016).

APPENDIX 5
Indices of Neutrality Detailed according to Concepts and Demographics.

	Tax		*Fiscal fee*		*Mandatory social contribution*	
Indices	*M*	*SD*	*M*	*SD*	*M*	*SD*
Overall neutrality index	**0.79**	**0.24**	**0.85**	**0.23**	**0.86**	**0.23**
Neutrality index according to gender						
Women	0.78	0.25	0.86	0.23	0.87	0.21
Men	0.80	0.24	0.84	0.24	0.84	0.24
Neutrality index according to the highest level of education completed						
Middle school	1	0	1	0	1	0
High school	0.81	0.24	0.85	0.23	0.87	0.21
University (bachelor degree)	0.75	0.26	0.80	0.27	0.83	0.25
University (master's degree)	0.74	0.27	0.91	0.17	0.83	0.25
University (PhD)	0.79	0.20	0.95	0.11	0.90	0.22
Neutrality index according to the main occupational status at present						
Student	0.80	0.22	0.80	0.24	0.85	0.21
Employee	0.78	0.25	0.88	0.22	0.87	0.22
Employer	0.87	0.24	0.87	0.19	0.83	0.29
Self-employed	0.79	0.30	0.88	0.22	0.85	0.23
Unemployed	1	0	1	0	-	-
Other status	0.68	0.40	0.81	0.38	0.63	0.53
Neutrality index according to the activity field						
Public administration	0.78	0.28	0.86	0.22	0.87	0.22
Agriculture	0.78	0.30	0.82	0.29	0.88	0.25
National defense	0.75	0.43	0.75	0.43	0.63	0.53
Education	0.82	0.20	0.85	0.22	0.88	0.21
Industry	0.79	0.27	0.94	0.14	0.88	0.22
Health care	0.83	0.24	0.72	0.31	1	0
Services and commerce	0.79	0.25	0.84	0.24	0.83	0.24
Other	0.75	0.26	0.83	0.27	0.87	0.23
Neutrality index according to the gross monthly income						
< 975 RON	0.82	0.23	0.84	0.23	0.86	0.21
975–2,516 RON	0.78	0.25	0.87	0.23	0.86	0.23
> 2,516 RON	0.77	0.25	0.80	0.26	0.84	0.25
Neutrality index according to the main income source						
Salary	0.77	0.25	0.88	0.23	0.88	0.22
Scholarship	0.75	0.24	0.72	0.28	0.80	0.24
Guaranteed minimum income, welfare	0.80	0.28	1	0	1	0
Money received from family	0.83	0.21	0.82	0.23	0.87	0.21
Money received from relatives living abroad temporarily or permanently	0.73	0.27	0.48	0.03	0.83	0.24
Income from investments, savings, or rents	0.82	0.25	0.82	0.18	0.86	0.25
Other sources	0.78	0.30	0.87	0.23	0.78	0.28
No income	0.94	0.14	0.93	0.15	0.50	-
Neutrality index according to participant's area of residence						
Rural	0.86	0.21	0.91	0.19	0.89	0.21
Urban	0.76	0.26	0.81	0.25	0.85	0.23

Note: *M* = average value; *SD* = standard deviation. Table structure was adapted after Stark et al. (2016).

APPENDIX 6
Tax Literacy Index Detailed Based on Demographics.

	Tax literacy index value	
Demographics	*M*	*SD*
Overall tax literacy index	**0.57**	**0.19**
Tax literacy index according to gender		
Women	0.56	0.19
Men	0.58	0.18
Tax literacy index according to the highest level of education completed		
Middle school	0.43	0.19
High school	0.53	0.18
University (bachelor degree)	0.62	0.19
University (master's degree)	0.66	0.13
University (PhD)	0.79	0.09
Tax literacy index according to main occupational status at present		
Student	0.52	0.17
Employee	0.60	0.19
Employer	0.65	0.14
Self-employed	0.60	0.20
Unemployed	0.41	0.32
Other status	0.49	0.31
Tax literacy index according to field of activity		
Public administration	0.53	0.21
Agriculture	0.64	0.19
National defense	0.45	0.24
Education	0.55	0.19
Industry	0.54	0.19
Health care	0.60	0.08
Services and commerce	0.61	0.18
Others	0.52	0.20
Tax literacy index according to gross monthly income		
< 975 RON	0.52	0.18
975–2,516 RON	0.59	0.19
> 2,516 RON	0.58	0.18
Tax literacy index according to main source of income		
Salary	0.59	0.19
Scholarship	0.56	0.17
Guaranteed minimum income, welfare	0.48	0.34
Money received from family	0.50	0.18
Money received from relatives gone abroad, temporarily or definitively	0.58	0.14
Income from investments, savings, or rents	0.58	0.26
Other sources	0.58	0.18
No income	0.52	0.20
Tax literacy index according to participant's area of residence		
Rural	0.55	0.19
Urban	0.57	0.19

Note: *M* = average value; *SD* = standard deviation.