The Non-Cognitive Roots of Civic Honesty: Evidence from the US

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Abstract

Even though a large experimental literature explored the links between personality traits and honesty, available evidence is inconclusive. In this study, we provide large-scale evidence on the influence of the "Big Five" personality traits on civic honesty, by considering the role played by individuals' socioeconomic status. To this aim, we rely on survey data from the Health and Retirement Study (HRS), which is representative of the US population aged 50 or more. We show that most "Big Five" traits significantly affect civic honesty, with Agreeableness being the strongest predictor. We view our findings as complementing and extending to civic-minded behavior the results of prior work on cheating based on small samples and non-representative subject pools.

Keywords: Civic Honesty; Personality Traits; Socioeconomic Status.
JEL Classification: D63; D91; I31.

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1. Introduction

In contemporary social sciences, there is growing consensus over the broad idea that democracies and market economies need to rely on civic-minded citizens to thrive over time. This general insight is backed by recent theoretical work as well as empirical evidence on values and institutions (Tabellini, 2008a; 2008b). Not surprisingly, the current research area on the determinants and consequences of honesty and civicness within and across societies, due to its relevance and scope, is attracting the interest of scholars from numerous disciplines, including political science, economics, psychology, and neuroscience. As Cohn et al. (2019) pointed out, "Honest behavior is a central feature of economic and social life. Without honesty, promises are broken, contracts go unenforced, taxes remain unpaid, and governments become corrupt" (p. 70; see on this also Gächter and Schulz, 2016). In the last decades, an influential body of empirical work in economics provided strong support to Cohn et al.'s (2019) claim on the power of honesty in the political and economic realms, documenting the large beneficial (direct and indirect) effects of civic norms as well as so called "generalized trust" and "generalized morality"[1] on innovation, economic and financial development, governmental performance and quality of economic policies (Knack and Keefer, 1997; La Porta et al., 1997; Guiso et al., 2004; Tabellini, 2008b)[2].

In the last years, an increasing number of studies have been investigating the effects of psychological, social and cognitive factors of the decision-making process underlying honest and dishonest behavior (Bucciol and Montinari, 2019). Within this burgeoning research area, a recent strand of experimental literature has been shedding light on the issue by assessing individuals' willingness to tell the truth in incentivized settings[3]. Unlike this body of laboratory work on lying, in this study we aim to contribute to our understanding of the determinants of "civic honesty". In our view, the defining feature of civic honesty can be identified in an individual's willingness to incur *personal costs* to behave sincerely in social interactions that

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[1]   Tabellini's (2008b) study offers empirical evidence clearly suggesting that well-functioning institutions are often observed in countries characterized by widespread "generalized morality", i.e., where individuals share values supporting a generalized application of norms of good conduct.

[2]   Relatedly, in recent years a burgeoning literature in political science has been increasingly examining the origins of civic duty and good citizenship (Loewen and Dawes, 2012; Weinschenk, 2014; Weinschenk and Dawes, 2018; Pruysers et al., 2019; also see Section 2 in this paper).

[3]   A clear and interesting stylized fact from this line of inquiry is that, even in one-shot anonymous interactions, many individuals refrain from lying maximally (Abeler et al., 2019). Also see Section 2 in this paper.

may generate *relevant beneficial effects* from a societal standpoint[4]. Therefore, being driven by civic honesty implies refraining from opportunistic behavior, that is not acting like a free rider in situations in which one has the opportunity to act selfishly without being observed by others[5].

More specifically, in this paper our primary goal is to shed light on the so far largely overlooked relationship between individuals' degree of civic honesty and their *personality*. Personality traits have been convincingly defined as "the relatively enduring patterns of thoughts, feelings, and behaviors that reflect the tendency to respond in certain ways under certain circumstances" (Roberts, 2009; p. 140). In our view, despite growing interest in the effects of civic-minded behavior on key political and socioeconomic outcomes (including voter turnout and economic growth), the analysis of the non-cognitive roots[6] of civic honesty so far has received relatively limited attention in empirical studies, especially in economics.

A recent but fast-growing economics literature has been shedding light on the role of individuals' "non-cognitive side", based on prior research documenting that personality traits affect a wide array of economically relevant dimensions, including labor market outcomes (Cubel et al., 2016), educational attainment (Lundberg, 2013) and financial decisions (Bucciol and Zarri, 2017). On a similar vein, a parallel, rapidly expanding line of inquiry in political science suggests that personality traits contribute to account for individual differences in a number of important domains, including political participation, political interest and vote choice (Pruysers et al., 2019). In our analysis of personality, we rely on the well-known "Big Five" model (Costa and McCrae, 1992), a prominent taxonomy of personality traits developed

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[4]   As noted by Cohn et al. (2019), "Civic honesty is essential to social capital and economic development but is often in conflict with material self-interest" (p. 70).

[5]   Guiso et al. (2011) define social capital as "those persistent and shared beliefs and values that help a group overcome the free rider problem in the pursuit of socially valuable activities". As highlighted by Knack and Keefer (1997), "Civic norms, such as the norm against littering, are defined here as those that resolve prisoner's dilemmas without imposing substantial external costs on other parties" (p. 1254). We see strong conceptual connections between the notion of civic honesty we use in this study, Guiso et al.'s (2011) definition of social capital as civic capital and Knack and Keefer's (1997) view of civic norms. Relatedly, in the political science literature, Loewen and Dawes (2012) interestingly describe an individual's sense of duty as "a belief that an individual has an obligation to undertake *actions that benefit others* even when the actions are *costly to themselves*" (p. 364; italics added).

[6]   In our view, it is important to distinguish between "cognitive" and "non-cognitive" factors, though we are aware that, as we acknowledged in one of our previous papers dealing with personality traits (Bucciol and Zarri, 2017), sharp contrasts between cognition and personality are not always easy to make (see on this also Borghans et al., 2008).

in psychology and now widely accepted across the social sciences (see Borghans et al., 2008, for further details on this).

Next, in light of recent empirical work focusing on the links between various dimensions of socioeconomic status and prosociality (Karadja et al., 2017; Bartling et al., 2020; Hvidberg et al., 2020; Andreoni et al., 2021), we enrich our analysis by also considering the role that individuals' actual *socioeconomic status* can play in affecting their degree of civic honesty. In particular, we pursued this goal by using two status measures (capturing individuals' objective and subjective positions in the social ladder, respectively) and isolating, through a mediation analysis, how much of the effect of status on civic honesty is influenced by personality. We also shed light on the *gender* dimension, inspired by prior research indicating that women are more honest (Friesen and Gangadharan, 2012; Azar et al., 2013; Grosch and Rau, 2017) than men and that personality traits, including the "Big Five" traits, are significantly influenced by gender (Chapman et al., 2007; Vianello et al., 2013).

We assess the strength of "civic honesty" by constructing an index based on respondents' answers to four questions aimed to capture individuals' degree of honesty in different real-life situations (including paying taxes, informing the cashier if he/she forgets to charge me for an item and copying others' homework at school). Our index aims to operationalize the notion of civic honesty illustrated above and is conceptually close to the survey-based multi-item measures advanced within the large empirical economics literature on social capital (see, e.g., Knack and Keefer, 1997, and Guiso et al., 2011)[7].

In order to empirically address these research questions, we rely on survey data from the Health and Retirement Study (HRS), a representative sample of the US population aged 50 or more. The reason why we believe that it is important to answer the aforementioned questions by means of large-scale, representative survey data is twofold. First, although, as we clarify in the next section, there is an extensive body of experimental psychology and economics work exploring the links between personality traits and various measures of cheating by relying on small samples from non-representative subject pools, relatively little is known about how personality impacts civic honesty, in particular when large-scale, representative samples are

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[7]   Knack and Keefer (1997) assess the strength of norms of civic cooperation by constructing a "civic" index based on items referring to individual behaviors including cheating on taxes or keeping money that you have found. Guiso et al. (2011) construct a survey-based index of civic capital by choosing questions capturing how much people value the public good (such as, e.g., avoiding a fare on public transport, cheating on taxes, lying in one's own interest and littering in a public space).

considered. Second, evidence from prior fieldwork clearly reveals that widespread civic norms, generalized trust and generalized morality can make a difference in terms of economic growth, governmental performance and quality of economic policies (Knack and Keefer, 1997; La Porta et al., 1997; Tabellini, 2008b). Therefore, it is key to learn more about the determinants of civic-minded behavior.

The remainder of the paper is structured as follows. Section 2 contains a selective review of the relevant strands of literature. In Section 3 we describe the data we used and some summary statistics. Section 4 illustrates the core findings of our analysis and Section 5 concludes. The Appendix provides details on the construction of our key variables.

2. Related Literature

Our work lies at the crossroads of three strands of literature. The first is the research area in economics focusing on the determinants of civic-minded behavior. Guiso et al. (2011) recall prior studies exploring the role of past history in affecting civic capital today. In particular, their work documents clear differences in terms of levels of civic capital between North and South of Italy that are likely due to huge historical differences between the two areas of the country, with cities that many centuries ago became a "commune" being endowed with more civic capital today. Based on data on payments to an "honor system" box for newspapers, Pruckner and Sausgruber (2013) present evidence from a field experiment and two complementary studies indicating that customers are partially honest and that moral reminders increase the level of honesty in payments on the intensive margin (consistently with a preference for honesty), whereas appealing to honesty has no impact on individuals' decisions over whether to pay or not. As emphasized by Tabellini (2008a), cooperation can be viewed as resulting from a trade-off between material incentives and individual values. Cohn et al. (2019) assess civic honesty by means of field experiments conducted in 40 countries around the globe and based on the "lost wallet" paradigm. Their findings, indicating that citizens were more likely to return wallets that contained larger amounts of money, can be explained by a combination of altruistic concerns and an aversion to viewing oneself as a thief[8].

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[8] Tannenbaum et al. (2020) validate survey measures of social capital with "lost wallet" paradigm data and interestingly show that survey measures of social capital are strongly and significantly correlated with country-level differences in wallet reporting rates.

The second is the recent but fastly-growing empirical line of inquiry in political science that has been exploring the relationships between personality traits and civic duty. As pointed out by Pruysers et al. (2019), "While there is good theoretical reasoning (..), there is limited empirical evidence that specifically links personality to the sense of civic duty and even less to attitudes of good citizenship more generally" (p. 99; see on this also Weinschenk, 2014). Foschi and Lauriola (2014) find that political and associational sociability are linked to personality domains and facets in the "Big Five" model and shed light on specific facets of sociability that can mediate between general personality traits and measures of civic involvement and political participation in a holistic model of political behavior. Weinschenk's (2014) analysis based on US data reveals that four "Big Five" traits influence an individual's sense of duty to vote in local and national elections. Using data from representative surveys conducted in 24 countries, Weinschenk (2017) investigate the impact of the "Big Five" traits on political and civic participation, reporting substantial variability of the effects of personality traits across countries. Weinschenk and Dawes' (2018) study seeks to provide insight into the mechanisms that link genes and political orientations and shows that genetic factors are able to account for a very large percentage of the correlation between civic duty and four of the "Big Five" traits. Pruysers et al. (2019) detect important connections between personality (including traits belonging to the so called "Dark Triad") and attitudes towards good citizenship (including activities such as voting in elections, paying taxes, obeying the law and staying informed) and civic duty to vote.

Finally, we also connect to the experimental literature in economics and psychology on honesty[9], with special regard to the body of work examining the relationships between personality traits and honest behavior. Despite the usage of different measures of cheating[10], laboratory research consistently reveals that human behavior displays a lot of heterogeneity in terms of honesty (Fischbacher and Föllmi-Heusi, 2013; Heck et al., 2018; Abeler et al., 2019). Recent evidence suggests that an important driver of honesty is individuals' willingness to maintain a positive self-image (Mazar et al., 2008; Fischbacher and Föllmi-Heusi, 2013). Abeler et al.'s (2019) meta-analysis offers evidence consistent with the idea that a preference

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[9] Over a century of research has examined the connections between student characteristics and academic dishonesty (Lee et al., 2020).

[10] Widely used cheating paradigms include the coin-toss task (Bucciol and Piovesan, 2011), the dice-roll task (Fischbacher and Föllmi-Heusi, 2013) and, in strategic interaction contexts, the deception game (see, for methodological considerations on this paradigm, Bucciol and Montinari, 2019). For an illustration of other widely used paradigms, see Abeler et al. (2019).

for being honest[11] and a preference for being seen as honest are the main motivations underlying truth-telling in the lab. However, it is worth noting that an important concern raised by laboratory studies on cheating has to do with their external validity, as recent work found that focusing on students as experimental participants tends to overestimate the magnitude of unethical behavior (Fosgaard, 2020).

As to the links between personality and honesty, Heck et al. (2018) noted that a large literature in psychology aims to account for the substantial individual differences in dishonest behavior detected in prior work by connecting unethical choices in cheating paradigms to personality traits (see, e.g., Horn et al., 2004; Williams et al., 2010; Hilbig et al., 2016). In particular, this strand of research has specifically explored the role of the so called Honesty-Humility dimension of the HEXACO personality model (Hilbig and Zettler, 2015). So far, however, the evidence provided by prior work is inconclusive on whether, to what extent and through which channels personality characteristics (including, in particular, the "Big Five" traits) are related to honest behavior (Horn et al., 2004; Williams et al., 2010; Hilbig et al., 2016; Hilbig and Zettler, 2015). In this regard, as emphasized by Heck et al. (2018), a relevant problem of existing studies is their reliance on small samples and, therefore, limited statistical power.

3. Data

We use data from the US Health and Retirement Study (henceforth HRS), a large-scale longitudinal survey collected every two years since 1992 by the Institute for Social Research of the University of Michigan. Data and questionnaires are available free of charge from the webpage www.umich.edu/~hrswww/.

The HRS is mainly devoted to explore the health conditions of a representative sample of US individuals aged 50 or more. Every wave has a core section regularly collecting detailed information along several dimensions, including health care, housing, assets, employment, and an experimental section covering specific topics that may change over time (e.g., technology use, time discounting). Of particular interest for this research is the "participant lifestyle questionnaire", included in the core section and devoted to a randomly selected half of the sample. The questionnaire regards the relationship with other people, as well as psychological

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[11] See on this also Sánchez-Pagés and Vorsatz's (2007) and Vanberg's (2008) experimental findings.

characteristics of the respondents. Importantly, in two waves (2008 and 2010) it includes the key questions of our analysis (on civic honesty and personality).

The final dataset used in this analysis is made of 10,588 complete observations on individuals collected between 2008 and 2010. Although the survey design is longitudinal, our dataset is purely cross-sectional because the half HRS sample that answers the participant lifestyle questionnaire rotates every two years.

3.1. Summary statistics

The variables used in the analysis are summarized in Table 1. We split them in three categories: Civic honesty and Socioeconomic status, Personality, and Sociodemographic controls. We refer to the Appendix for the definition and the exact wording of the questions on civic honesty, socioeconomic status and personality.

Our main variable of interest is *Civic Honesty*. This is a score from 0 to 10 on the average agreement with a set of statements about civic-minded behaviors. The four items we used to construct this index are the following: (i) "If I could get away with it, I would not pay taxes"; (ii) "I could be insincere and dishonest if the situation required me to do so"; (iii) If the cashier forgot to charge me for an item, I would tell him/her"; (iv) "When I was in school, I would rather get a bad grade than copy someone else's homework". Its average is relatively high (7.95), with the distribution more concentrated toward higher values. As to the scope of application of norms of good conduct, Tabellini (2008b) stresses a key distinction between "limited" and "generalized" morality: we believe that, in this study, the four items used to construct civic honesty allow us to conceptualize it as an index of *generalized* – rather than limited – morality.

We also consider two dimensions of socioeconomic status: objective and subjective socioeconomic status. *Subjective socioeconomic status* is self-assessed from a question asking respondents to place themselves on a 10-rung ladder, taking into account that those at the top of the ladder have "the most money, most education, and best jobs". In this case the average is 6.47, with most of the distribution concentrated between 5 and 8. Following Bucciol et al. (2015), the *Objective socioeconomic status* score is built from a factor analysis, computed separately for each wave, on the three key status dimensions included in the HRS "social ladder" question described above with regard to subjective status: money (income, financial wealth and real wealth, taken separately), education (college, high school, lower), and job (employee, self-employed, neither). The score, which is standardized to have mean 0 and

variance 1, should provide us with an "objective" measure of socioeconomic status, or at least an objective measure consistent with the subjective socioeconomic status measure[12].

Our primary goal is to link civic honesty to personality. Personality is measured through a set of five scores informing on the "Big Five" traits (*Openness to Experience*, *Conscientiousness*, *Extraversion*, *Agreeableness* and *Neuroticism*). The "Big Five" model is one of the most commonly used taxonomies in the management, psychology and economics strands of literature focusing on non-cognitive traits (Costa and McCrae, 1992; Volk et al., 2011; Bucciol and Zarri, 2017): at the broadest level of abstraction, this framework posits that these five overarching dimensions are fundamental and universal. Each index takes values in the 0-1 range and is measured as the average correspondence to a list of adjectives. According to Table 1, an average individual shows relatively high values of Openness, Conscientiousness, Extraversion and Agreeableness and relatively low values of Neuroticism.

Finally, we have extensive information on the sociodemographic characteristics of each individual. From Table 1 we therefore learn that the average respondent is 67 years old, woman, non-black, US born, married, with children and not in very good health conditions (i.e., in good, fair or poor conditions). In particular we point out that, given our purpose, an advantage of looking at people over 50 – rather than at younger individuals – is that this allows us to consider individuals who have higher stability both in personality traits and in socioeconomic status, as they are either people who retired or working people who are unlikely to change their job (and, therefore, their income level).

TABLE 1 ABOUT HERE

3.2. Research hypotheses

We formulate the following research hypotheses:

Hypothesis 1. Civic honesty is related to personality traits.

The reason why we conjecture that the "Big Five" traits are significant predictors of civic honesty is that, even though available empirical evidence on some traits is mixed and inconclusive (Heck et al., 2018; Pruysers et al., 2019), important links between these non-

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[12] In line with Bucciol et al. (2015), the correlation between objective and subjective measures is positive but not high (0.383).

cognitive factors and honest behavior (or closely related constructs) are documented in prior studies (Bekkers, 2005; Weinschenk, 2014; Giluk and Postlethwaite, 2015; Pruysers et al., 2019; Lee et al., 2020).

Hypothesis 2. Civic honesty is related to socioeconomic status.

In economics, a growing number of empirical studies examine the relationships between key dimensions of socioeconomic status and various measures of prosocial values or behaviors (Karadja et al., 2017; Bartling et al., 2020; Hvidberg et al., 2020; Andreoni et al., 2021). Therefore, we expect also individuals' degree of civic honesty to be linked to the position they occupy on the social ladder.

Hypothesis 3. Personality correlates with civic honesty both directly and indirectly via socioeconomic status.

As we stated above, we expect personality to correlate with civic honesty. More specifically, we conjecture that part of this connection passes through socioeconomic status, as prior work indicates that personality traits influence individuals' socioeconomic status (Bucciol et al., 2015).

Hypothesis 4. The relationship between civic honesty and personality differs by gender.

Previous studies detected significant gender differences with regard to both cheating (Friesen and Gangadharan, 2012; Azar et al., 2013; Bucciol et al., 2013; Grosch and Rau, 2017) and personality traits (Chapman et al., 2007; Vianello et al., 2013). Therefore, we conjecture that also the relationship between civic honesty and personality differs by gender.

4. Results

Given the cross-sectional nature of the dataset, in our analysis we perform OLS regressions with robust standard errors. In the following, we take the convention to comment on coefficients that are significant at least at the 5 percent level.

We start our analysis with the regressions reported in Table 2. Column (1) shows the baseline specification, that aims to describe civic honesty as a function of personality and the sociodemographic control variables. We find significant effects for all the personality traits

except for Openness to Experience, thus providing strong support to *Hypothesis 1*. Two coefficients are *positive* (for Conscientiousness and Agreeableness), while the other two are *negative* (for Extraversion and Neuroticism).

The largest effect is for Agreeableness: one standard deviation increase in this score raises civic honesty by 0.161*2.798 =0.45 points on a scale from 0 to 10. We view this finding as broadly consistent with Pruysers et al. (2019), arguing that agreeable individuals tend to be prosocial and community oriented and expecting them to strongly endorse good citizenship (see on this also Weinschank's, 2014, findings on sense of duty to vote). Moreover, it is noteworthy that for this trait previous meta-analytical studies documented a negative relationship with dishonesty (Giluk and Postlethwaite, 2015; Lee et al., 2020) and prior experimental work on social dilemma settings showed that Agreeableness plays an extremely important role in accounting for cooperative behavior (Volk et al., 2011; Kagel and McGee, 2014) and the stability of cooperation preferences (Volk et al., 2012).

Also the positive effect of Conscientiousness on civic honesty is in line with prior research: conscientious people typically feel compelled to abide by rules and norms (Weinschenk, 2014) and this trait turned out to be negatively associated with dishonesty (Giluk and Postlethwaite, 2015; Lee et al., 2020) and positively related to participation in voluntary associations (Bekkers, 2005), sense of duty to vote (Weinschank, 2014) and good citizenship (Pruysers et al., 2019)[13].

Regarding the control variables, we observe a large effect of *gender* (being a woman raises civic honesty by 0.455 points), similar to the one of Agreeableness, and smaller significant effects of age[14], being married and in very good health conditions (positive), and being immigrate and having children (negative). Our result on gender corroborates a well-known finding from previous work, documenting that women cheat less than men in laboratory settings (Friesen and Gangadharan, 2012; Grosch and Rau, 2017) as well as in different field domains, including returning excess change at a restaurant (Azar et al., 2013) and fare dodging (Bucciol et al., 2013). Also recent empirical work on prosociality reveals clear gender

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[13] Our results on Conscientiousness and Agreeableness are also in line with Dohmen's (2008) survey-based analysis on Germany, as they show that the "Big Five" traits – in particular, Conscientiousness and Agreeableness – influence a key social preference such as positive reciprocity.

[14] This finding is broadly consistent with prior research detecting a negative relationship between cheating and age (see, e.g., Heck et al., 2018; Pruysers et al., 2019; Fosgaard, 2020) as well as with studies indicating that positive reciprocity and age are positively related (Dohmen et al., 2008).

differences, with prosocial preferences such as positive reciprocity and altruism being more pronounced among women in the Global Preference Survey (Falk et al., 2018).

The R-squared statistic from this regression is 0.107, meaning that this model is able to explain 10.7 percent of the information concerning civic-minded behavior. The fit is generally good, considering the large sample size and the behavioral nature of the dependent variable. It is also interesting to note that the same model, without the personality variables, would obtain an R-squared statistic of 0.044. This means that personality alone is able to explain an additional 6.3 percent of the data after accounting for the sociodemographic controls.

For comparison purposes, in Column (2) we change the specification and replace the five measures of personality with our indicator of objective socioeconomic status. We keep on finding similar significant effects for the sociodemographic controls. In addition, objective socioeconomic status displays a positive coefficient: one standard deviation increase in the index is related to a 0.101 points increase in civic honesty. We thus find support to our *Hypothesis 2*: socioeconomic status is positively and significantly related to civic honesty. We notice, however, that the R-squared statistic in Column (2) is much smaller than the one in Column (1), and similar to the one obtained in a model with only the sociodemographic controls. This interestingly suggests that the personality variables are much more relevant than socioeconomic status to predict civic-minded behavior.

Since both personality and socioeconomic status seem relevant to account for civic-minded behavior, in Column (3) we look at a specification incorporating both dimensions. All our previous evidence is confirmed. We only notice that the coefficient on socioeconomic status is now about two-thirds of the coefficient we found in the model of Column (2) without personality. The inclusion of socioeconomic status in the specification does not seem to have improved the fit of the model to a large extent: the R-squared statistic is now 0.108 as opposed to 0.107 from Column (1).

As a robustness check, in Column (4) we replicate the analysis of Column (3), but replace the objective socioeconomic status index with its subjective counterpart defined in Section 3. In so doing, we lose about 900 observations for which we lack information on subjective status. Changes with respect to the model in Column (3), however, are minimal.

We finally conduct a mediation analysis to investigate whether differences in personality relate to civic honesty both directly and indirectly through socioeconomic status. The intended indirect effect is then the part of the relationship between civic honesty and socioeconomic status that is attributable to personality. In the case of objective status the indirect effect, which is the difference between the coefficients of status in Columns (2) and

(3), is equal to 0.036 (standard error: 0.007), that is, about 36 percent of the total effect of socioeconomic status. In the alternative case using subjective status, the indirect effect is even more important and amounts to about 59 percent of the total effect. These results support our *Hypothesis 3* about the indirect effect of personality on civic honesty.

TABLE 2 ABOUT HERE

4.1. Gender differences

We believe that our previous findings on the relationship between civic honesty, personality and socioeconomic status may differ by gender. It is reasonable to expect variations because men and women seem to differ in terms of all these dimensions; see Figure 1. Indeed, *t*-tests run on our sample suggest that women perform significantly higher in civic honesty and significantly lower in socioeconomic status[15], and that they have higher values of Conscientiousness, Extraversion, Agreeableness and Neuroticism. The only key dimension in which we find no statistical difference is Openness to Experience (t-test: 1.16; p-value: 0.246).

FIGURE 1 ABOUT HERE

In Table 3 we therefore repeat the analysis of Table 2 – in particular, we use the specifications in Columns (1) and (3) – separately for men and women. We then regress civic honesty on personality (Columns 1 and 3, respectively for men and women) and on personality and objective socioeconomic status (Columns 2 and 4).

While the effects for women are qualitatively identical to the full sample, for men we lack two effects. Specifically, we no longer find significant effects for the Extraversion trait, and for socioeconomic status. We then provide broad support to our *Hypothesis 4* on gender differences in the relationship between civic honesty and personality.

TABLE 3 ABOUT HERE

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[15] Even though in the 1980s US women's relative wages began to rise sharply and continued to increase (though slowly and more unevenly) thereafter, the gender pay gap remains substantial (Blau and Kahn, 2017).

5. Conclusions

Understanding the determinants of civic honesty is extremely important, as the diffusion of dishonesty has detrimental impacts on the inner workings of modern economies (Houser et al., 2016), while internalized norms of generalized morality are likely to "induce reciprocal cooperation and to instill confidence and respect for abstract principles such as the rule of law, fundamental individual rights, or democratic procedures and checks and balances. Individuals who practice generalized (as opposed to limited) morality are more reluctant to free ride on others" (Tabellini, 2008b; p. 260).

In this study, by means of large-scale survey data on a representative sample of US individuals aged 50+, we show that personality traits significantly influence individuals' degree of civic honesty. We also find that these effects are both direct and indirect (i.e., mediated by individuals' socioeconomic status). More broadly, we also contribute to our understanding of the complex relationships between individuals' socioeconomic position in the social ladder and values and behaviors associated with their *prosociality* (recent economics work on this includes Karadja et al., 2017, Bartling et al., 2020, Hvidberg et al., 2020, and Andreoni et al., 2021).

This study has at least three limitations that offer avenues for future research. First, personality and socioeconomic status could suffer from endogeneity in our models. Indeed, we cannot exclude that civic honesty affects both dimensions (reverse causality) or that other variables excluded from the specification are able to explain both dependent and explanatory variables (omitted variable bias). Unfortunately, the cross-sectional nature of our data makes it difficult to properly identify the relationship between the variables. Future research should be based on longitudinal data to mitigate this concern. Second, our analysis relies on self-reported and non-incentivized scores of personality and civic honesty, which do not necessarily coincide with true scores. We believe that this issue is more relevant for civic honesty, as individuals could have poor incentives to reveal their true degree of civicness and be tempted to over-report more socially desirable habits[16]. In the future, carefully designed, incentivized experiments focusing on personality traits and behavioral measures of civic honesty may provide interesting complementary evidence. Finally, it is important to note that our study is based on individuals aged 50 and more. While this allows us to focus on a sample with arguably more stable personality traits and socioeconomic status (compared to younger people), we acknowledge

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[16] Regarding this well-known "social desirability" bias concern, Guiso et al. (2011) reassuringly document that their measures of civicness are positively and highly correlated with other measures of values that are arguably less subject to this problem.

that it prevents us from generalizing our results to the whole population. For this reason, we believe that it will be important to replicate the analysis on a sample characterized by higher variability in age.

A further possible extension of our work would be to focus on a number of non-cognitive factors not included in the "Big Five" taxonomy: in this regard, it is plausible that other personality traits studied in psychology (such as, e.g., need for cognition, need for affiliation and conflict avoidance) play a non-negligible role in impacting civic honesty. In the future, it will also be key to dig deeper into the complex interplays and joint roles of personality traits, environmental stimuli and genetic factors (Loewen and Dawes, 2012; Weinschenk and Dawes, 2018) in influencing civic-minded behavior. Next, it will be interesting to see whether our findings hold once we consider a civicness index incorporating other items aimed at capturing individuals' behavior in social dilemma environments (e.g., littering, keeping money that you have found and avoiding a fare on public transport). These questions are left as important avenues for future research in economics, psychology and political science on the theme.

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Table 1. Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.
Civic honesty and socioeconomic status				
Civic honesty	7.947	1.915	0	10
Objective socioec. status	0	1	-3.971	2.265
Subjective socioec. status	6.471	1.722	1	10
Personality				
Openness	0.648	0.186	0	1
Conscientiousness	0.686	0.137	0	1
Extraversion	0.733	0.186	0	1
Agreeableness	0.843	0.161	0	1
Neuroticism	0.446	0.160	0	1
Sociodemographic controls				
Age	67.071	7.531	50	80
Woman	0.584	0.493	0	1
Black	0.015	0.122	0	1
Immigrate	0.095	0.293	0	1
Married	0.662	0.473	0	1
Household size	0.502	1.033	0	11
If children	0.936	0.244	0	1
Excellent health	0.425	0.494	0	1
Year 2010	0.473	0.499	0	1

Note. 10,588 observations, with the only exception of Subjective socioec. status for which we have 9,669 observations.

<div align="center">**Table 2**. Main analysis</div>

Dependent Variable	(1) Civic honesty	(2) Civic honesty	(3) Civic honesty	(4) Civic honesty
Openness	-0.212*		-0.245**	-0.297**
	(0.124)		(0.125)	(0.132)
Conscientiousness	1.044***		1.000***	1.080***
	(0.165)		(0.166)	(0.172)
Extraversion	-0.328**		-0.306**	-0.332**
	(0.132)		(0.132)	(0.138)
Agreeableness	2.798***		2.808***	2.811***
	(0.150)		(0.150)	(0.157)
Neuroticism	-1.351***		-1.317***	-1.274***
	(0.121)		(0.121)	(0.129)
Objective socioec. status		0.101***	0.064***	
		(0.021)	(0.021)	
Subjective socioec. status				0.026**
				(0.012)
Age	0.023***	0.023***	0.022***	0.023***
	(0.002)	(0.002)	(0.002)	(0.003)
Woman	0.455***	0.652***	0.455***	0.461***
	(0.039)	(0.039)	(0.039)	(0.040)
Black	0.022	0.038	0.058	-0.027
	(0.161)	(0.165)	(0.162)	(0.176)
Immigrate	-0.162**	-0.197***	-0.143**	-0.115*
	(0.065)	(0.067)	(0.065)	(0.068)
Married	0.202***	0.152***	0.162***	0.177***
	(0.040)	(0.043)	(0.042)	(0.042)
Household size	-0.006	0.002	0.004	0.008
	(0.019)	(0.019)	(0.019)	(0.020)
If children	-0.194***	-0.154**	-0.184**	-0.177**
	(0.072)	(0.076)	(0.072)	(0.075)
Excellent health	0.180***	0.308***	0.152***	0.172***
	(0.037)	(0.038)	(0.038)	(0.039)
Year 2010	0.032	0.032	0.041	0.027
	(0.035)	(0.037)	(0.035)	(0.037)
Constant	4.045***	5.911***	4.118***	3.862***
	(0.219)	(0.188)	(0.220)	(0.235)
R-squared	0.107	0.046	0.108	0.108
Observations	10,588	10,588	10,588	9,669

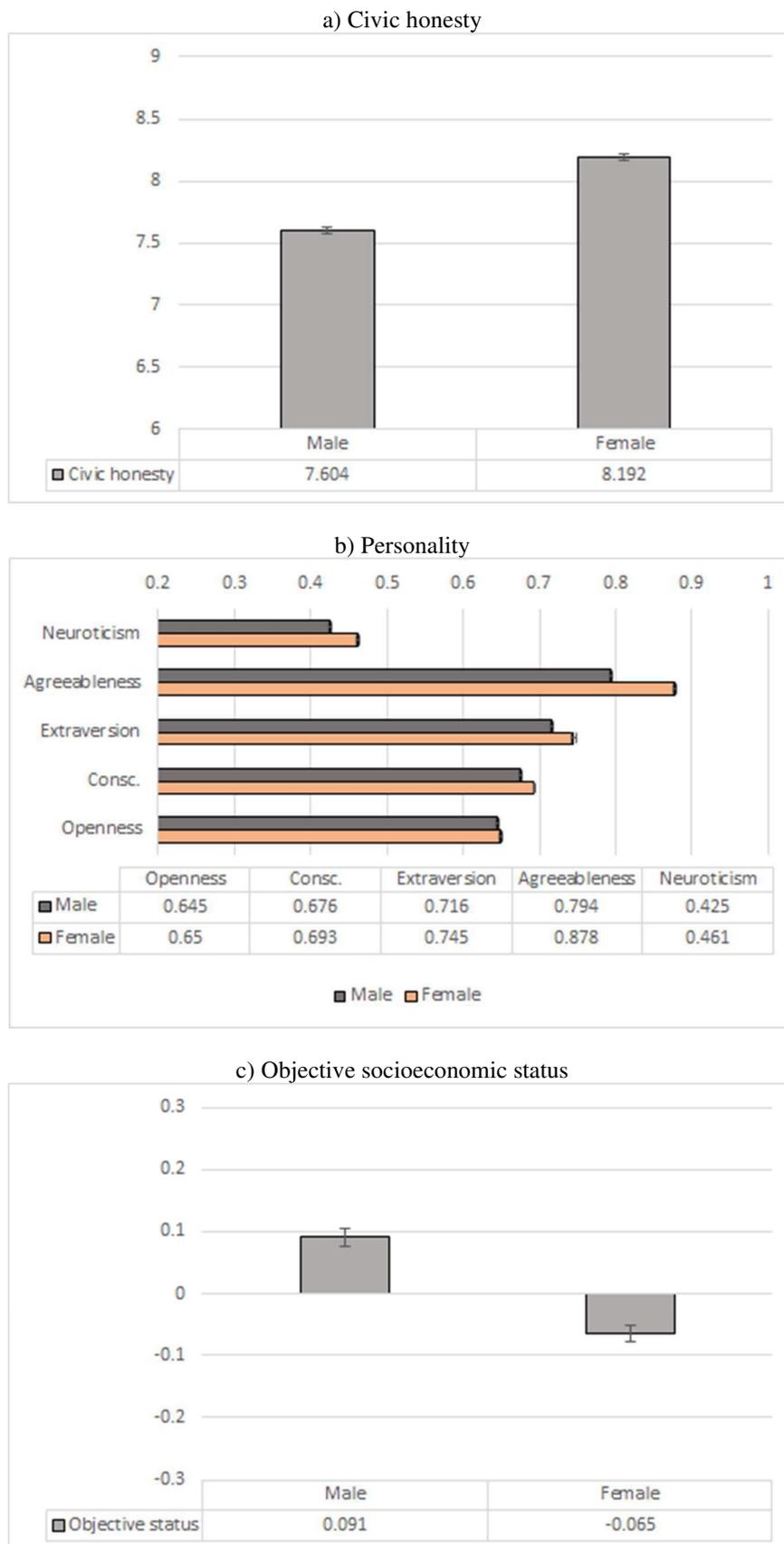Note: The mediators are the five personality traits. Robust standard errors in parentheses;
*** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 3. Analysis by gender

Dependent Variable	(1) Civic honesty	(2) Civic honesty	(3) Civic honesty	(4) Civic honesty
Gender	Men	Men	Women	Women
Openness	-0.118	-0.134	-0.247	-0.290*
	(0.206)	(0.208)	(0.154)	(0.155)
Conscientiousness	1.030***	1.009***	1.032***	0.977***
	(0.258)	(0.260)	(0.214)	(0.215)
Extraversion	-0.013	-0.003	-0.546***	-0.516***
	(0.215)	(0.215)	(0.166)	(0.167)
Agreeableness	2.627***	2.636***	2.910***	2.908***
	(0.221)	(0.221)	(0.206)	(0.205)
Neuroticism	-1.488***	-1.474***	-1.259***	-1.211***
	(0.197)	(0.198)	(0.153)	(0.153)
Objective socioec. status		0.027		0.089***
		(0.034)		(0.026)
Age	0.023***	0.023***	0.022***	0.021***
	(0.004)	(0.004)	(0.003)	(0.003)
Black	-0.061	-0.046	0.077	0.127
	(0.276)	(0.276)	(0.191)	(0.193)
Immigrate	-0.141	-0.132	-0.173**	-0.148*
	(0.107)	(0.107)	(0.082)	(0.082)
Married	0.296***	0.280***	0.152***	0.095*
	(0.073)	(0.075)	(0.048)	(0.050)
Household size	0.044	0.048	-0.042*	-0.028
	(0.032)	(0.033)	(0.023)	(0.023)
If children	-0.409***	-0.404***	-0.040	-0.027
	(0.112)	(0.112)	(0.095)	(0.095)
Excellent health	0.196***	0.185***	0.171***	0.131***
	(0.060)	(0.061)	(0.047)	(0.048)
Year 2010	0.086	0.090	-0.005	0.005
	(0.057)	(0.057)	(0.045)	(0.045)
Constant	4.005***	4.034***	4.501***	4.611***
	(0.336)	(0.337)	(0.292)	(0.293)
R-squared	0.097	0.097	0.081	0.083
Observations	4,409	4,409	6,179	6,179

Note: The mediators are the five personality traits. Robust standard errors in parentheses;
*** p<0.01, ** p<0.05, * p<0.1.

Figure 1. Average values of civic honesty, personality and socioeconomic status by gender

a) Civic honesty

	Male	Female
☐ Civic honesty	7.604	8.192

b) Personality

	Openness	Consc.	Extraversion	Agreeableness	Neuroticism
■ Male	0.645	0.676	0.716	0.794	0.425
☐ Female	0.65	0.693	0.745	0.878	0.461

■ Male ☐ Female

c) Objective socioeconomic status

	Male	Female
☐ Objective status	0.091	-0.065

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THE NON-COGNITIVE ROOTS OF CIVIC HONESTY: EVIDENCE FROM THE US

Supplementary Appendix

A.1. Civic honesty

The civic honesty score is constructed from the following question, taken from Roberts et al. (2005):

"Please say how much you agree or disagree with the following statements.

[a] If I could get away with it, I would not pay taxes.

[b] I could be insincere and dishonest if the situation required me to do so.

[c] If the cashier forgot to charge me for an item, I would tell him/her.

[d] When I was in school, I would rather get a bad grade than copy someone else's homework."

The question reported in the HRS questionnaire originally aimed to expand the assessment of conscientiousness and lists many more statements (24 overall), where each group of four statements is meant to describe a specific facet. The four items reported above tap into one of these facets (termed "Virtue"). As we make clear in the main text of the paper, we view instead these items as the four components of a measure of "generalized morality" (civic honesty).

Possible answers to each item are six: "Strongly disagree", "Somewhat disagree", "Slightly disagree", "Strongly agree", "Somewhat agree" and "Slightly agree". Following Smith et al. (2013), we assign the value 1, 2, 3, 4, 5 or 6 respectively to each possible answer.

The score is the average of the answer to the four items, where we reverse the value to items [a] and [b]. We also set the score to missing when more than two underlying items are missing. The score used in the analysis is rescaled in the 0-10 range.

The score turns out to be highly correlated with each of the four raw items (the correlation ranges between 0.61 and 0.68 in absolute terms) and especially with item [a] about not paying taxes. For details see Table A.1.

Table A.2. Correlation between civic honesty and its components

[a] Not paying taxes	-0.676***
[b] Dishonesty	-0.622***
[c] Not reporting mistake	0.610***
[d] Not copying	0.638***

Note: *** p<0.01, ** p<0.05, * p<0.1.

A.2. Socioeconomic status

In the analysis we consider two measures of socioeconomic status (subjective and objective). The subjective score is based on the following question, using the MacArthur Scale of Subjective Social Status[1]:

"Think of this ladder as representing where people stand in our society. At the top of the ladder are the people who are the best off - those who have the most money, most education, and best jobs. At the bottom are the people who are the worst off - who have the least money, least education, and the worst jobs or no jobs. The higher up you are on this ladder, the closer you are to the people at the very top and the lower you are, the closer you are to the people at the very bottom.
Please mark an X on the rung on the ladder where you would place yourself."

The score takes discrete values in the 1-10 range, because the ladder provided with the question is made of ten rungs.

The objective score is derived as in Bucciol et al. (2015), in such a way to obtain an objective measure based on the information that is explicitly mentioned in the question for the subjective score. We therefore derive one score from a factor analysis with polychoric correlation, computed separately for each wave, on the following variables: education degree (college, high school, lower), employment status (employee, self-employed, neither), income, financial and real wealth. Monetary values are taken in inverse hyperbolic sine (HIS) and converted in 2016 prices using the CPI index from BLS Consumer Price Index, all urban consumers, all items (annual average). The score used in the analysis is standardized to have mean 0 and variance 1. The higher the index, the higher the level of objective social status.

The score turns out to be correlated the most with financial and real wealth (the correlation is 0.89 with financial wealth and 0.77 with real wealth) and the least with occupational status, while it shows no correlation with only one dimension (high school degree). For details see Table A.2.

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[1] http://www.macses.ucsf.edu/Research/Psychosocial/notebook/subjective.html.

Table A.2. Correlation between objective socioeconomic status and its components

Income (IHS)	0.574***
Financial wealth (IHS)	0.885***
Real wealth (IHS)	0.764***
Home ownership	0.530***
Employee	0.062***
Self-employed	0.144***
High school	0.003
College	0.336***

Note: *** p<0.01, ** p<0.05, * p<0.1.

A.3. Personality

The personality scores are constructed from the following question, taken from Lachman and Weaver (1997):

"Please indicate how well each of the following describes you.
[a] Outgoing
[b] Helpful
[c] Moody
[d] Organized
[e] Friendly
[f] Warm
[g] Worrying
[h] Responsible
[i] Lively
[j] Caring
[k] Nervous
[l] Creative
[m] Hardworking
[n] Imaginative
[o] Softhearted
[p] Calm
[q] Intelligent
[r] Curious
[s] Active
[t] Careless

[u] Broad-minded

[v] Sympathetic

[w] Talkative

[x] Sophisticated

[y] Adventurous

[z] Thorough"

Possible answers to each item are four: "A lot", "Some", "A little" and "Not at all". Following Smith et al. (2013), we assign the value 4, 3, 2 or 1 respectively to each possible answer. We assign the reverse value to items [p] and [t]. Scores are the average of the answers to the following items:

Openness: [l], [n], [q], [r], [u], [x], [y].
Conscientiousness: [d], [h], [m], [t], [z].
Extraversion: [a], [e], [i], [s], [w].
Agreeableness: [b], [f], [j], [o], [v].
Neuroticism: [c], [g], [k], [p].

We also set a score to missing when more than half of the underlying items are missing.
In the analysis we rescale each index to take values in the 0-1 range.

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