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Big Five personality traits predict small but robust differences in civic engagement

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Abstract

Objective: This preregistered study provides robust estimates of the links between Big Five personality traits and civic engagement across different samples and life stages.

Methods: We recruited two samples from the United States and United Kingdom (total $N=1593$) and measured Big Five domains, Big Five aspects, and six civic engagement indicators: volunteerism, charitable giving, donating blood, posthumous organ donation, political voting, and vaccination. We compared the links between these measures across samples and tested moderation across life stages and several sociodemographic variables. We explored whether these links replicate between self- and peer-reports.

Results: We found small but robust effects. Agreeable, extraverted, and open/intellectual participants reported more civic engagement, especially volunteerism and charitable giving. Neurotic and conscientious participants mainly reported less civic engagement, especially blood and organ donations. One of the two Big Five aspects often drove these links, such as Compassion in the link between Agreeableness and volunteerism. We found some differences between younger and middle-aged adults.

Conclusions: Big Five personality traits predict civic engagement modestly but consistently, with adequate study power being critical to detecting these links. Lower-order traits, such as Big Five aspects, clarify the relationships between traits and engagement. Life stages and sociodemographic variables have limited effects.

KEYWORDS

aspects, charitable giving, donating blood, political voting, posthumous organ donation, vaccination, volunteerism

1 | INTRODUCTION

Society relies on the voluntary engagement of citizens for essential social functions that paid or forced labor cannot

replace (OECD, 2001; WHO, 2010). Civic engagement is crucial for healthy democracies and can be understood and developed through personality psychology (Bleidorn et al., 2019; Roberts et al., 2007). This involves identifying

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personal factors that predict individual differences in civic engagement, environmental factors that promote or constrain these effects, and encouraging behaviors that best serve society.

Previous research suggests that Big Five personality traits (Agreeableness, Extraversion, Conscientiousness, Neuroticism, and Openness/Intellect) can predict civic engagement, but the strength of these associations and potential age and sociodemographic differences need clarification (for a description of Big Five traits, see Costa & McCrae, 1995; DeYoung et al., 2007). This preregistered study provides robust estimates of these links through cross-validation in large U.S. and U.K. samples using self-reports of broad domain and lower-order traits aspects. Additionally, the study explores these links using peer-reported personality traits.

1.1 | Civic engagement is essential for healthy democracies

Civic engagement “describes how an active citizen participates in the life of a community in order to improve conditions for others or to help shape the community’s future” (Adler & Goggin, 2005, p. 241). Research has identified six key indicators of civic engagement: volunteerism, charitable giving, blood donation, posthumous organ donation, political voting, and vaccination (see Bekkers, 2006; Ferguson et al., 2019). Each of these indicators has significant economic and social benefits.

Volunteerism accounts for a significant portion of the global GDP, while charitable giving is essential for areas such as health, education, and government (OECD, 2015, 2021). Donating blood and posthumous organ donation are critical to meeting the increasing international demand for these resources (WHO, 2010, 2020). Political voting supports democratic values and institutions, while vaccination saves millions of lives and prevents the spread of viruses (Ehreth, 2003; Galston, 2007). While these behaviors are beneficial, individual differences in willingness and extent to engage exist, and personality traits have been shown to predict these individual differences (e.g., Galston, 2007; Omoto et al., 2010).

1.2 | Links between personality traits and civic engagement

Different personality profiles may influence civic engagement for various reasons. For example, agreeable individuals tend to value benevolence and altruism and may thus be more likely to engage in corresponding actions like volunteering and donating blood or organs (Bekkers, 2006;

Graziano & Tobin, 2009; Habashi et al., 2016). Civic institutions like schools, churches, or the boy scouts can attract people with matching personalities and guide them toward adopting actions that suit their traits best (Seligman & Csikszentmihalyi, 2000; Torney-Purta, 2002). If successful, civic engagement may become part of their identity, and they may continue to engage in corresponding actions to feel consistent with their personalities (Flanagan & Levine, 2010; McAdams & Pals, 2006; Pratt & Lawford, 2014).

Similar hypotheses have been proposed for the other Big Five personality traits. Extraverted individuals tend to be sociable and hence should be more inclined to engage in public activities like volunteering (Bekkers, 2006; King et al., 2015; Omoto et al., 2010). Conscientious individuals tend to endorse obedience and citizenship and may hence participate more in civic or political duty activities, like voting and vaccination (Gerber et al., 2011; Mondak et al., 2010; Mondak & Halperin, 2008). Also, they are often hardworking and productive, which may enable them to donate more to charitable organizations (Ha et al., 2013; Wiepking & Bekkers, 2012). Neurotic individuals tend to be anxious and withdrawn and may hence be less likely to engage in public activities like volunteerism, or those perceived as risky, such as donating blood and vaccination (e.g., Ackermann, 2019; Ferguson, 2004; Halstead et al., 2022). Finally, open/intellectual individuals tend to be inclined to intellectual pursuits and community service, making them more likely to engage in activities such as voting and registering as organ donors (Ferguson et al., 2019; Mondak & Halperin, 2008; Smillie et al., 2019).

The evidence for these associations is mixed, however, and most studies have reported smaller-than-expected effects and some even contradicting associations (e.g., Bekkers, 2006; Brown & Taylor, 2015; Mondak & Halperin, 2008). Possible explanations for the mixed evidence include differential effects of lower-order traits, differential effects in specific life stages, and insufficient study power.

1.2.1 | Differential effects of lower-order traits may obscure correlations of higher-order traits

Personality differences can be organized hierarchically, such as into domains and aspects (DeYoung et al., 2007), narrow facets (Costa & McCrae, 1995), or even narrower nuances (Möttus et al., 2017). For example, DeYoung et al. (2007) separated the Big Five domains into two aspects a piece: Openness and Intellect (Openness/Intellect), Compassion and Politeness (Agreeableness), Assertiveness and Enthusiasm (Extraversion), Industriousness and Orderliness (Conscientiousness), and Withdrawal and Volatility (Neuroticism).

Previous studies on the relationship between personality traits and civic engagement have mostly used domain-level measures that tend to be heterogeneous, resulting in an uneven sampling of content (e.g., Crowe et al., 2018; Schwaba et al., 2020). Therefore, some recent studies have used aspect-level measures to explain previously contradictory results. For example, theory and initial evidence suggest that the Intellect aspect predicts posthumous organ donation, while Politeness and Orderliness predict political voting and flu vaccination, and Compassion predicts volunteerism and charitable giving (Bekkers, 2010; Ferguson et al., 2019; Graziano & Eisenberg, 1997; Smillie et al., 2019). However, few such studies exist, and it is unclear how distinguishing the other aspects could help explain mixed results in previous research.

1.2.2 | Age-graded trends may moderate correlations of higher-order traits

Lifespan theories of aging propose that individuals experience different life stages with specific themes and developmental tasks, which may affect the links between personality traits and civic engagement (Erikson, 1959; Freund & Baltes, 2002). Age-related changes in available resources may also play a role, with younger and middle-aged adults potentially having fewer resources, such as time and money, for civic engagement, while older adults may have more opportunities to express their personality through such activities (Freund & Blanchard-Fields, 2014). However, the opposite pattern is also possible: when more resources are available, most people may be inclined to do or give something regardless of their personality. In this case, high scores on relevant traits may be more crucial in younger adults when resources are limited, leading to stronger associations between personality traits and civic engagement.

Previous research has found that personality traits explain additional variance in civic engagement when controlling for age, but it is unclear whether these associations are stronger in certain life stages (see Bekkers, 2010; Ha et al., 2013; Hill, 2016). Some recent studies have shown age-related moderation in the links between personality and related outcomes, suggesting that such moderation may also exist for personality traits and civic engagement (Hopwood, Schwaba, et al., 2022; Soutter et al., 2020).

1.2.3 | Insufficient study power may produce differences between study results

Prior studies suggest small correlations between Big Five traits and civic engagement indicators. Even small effects can have significant societal benefits when aggregated

over time and many people. For example, the association between smoking and lung cancer is estimated at $p < 0.10$, and yet smoking is widely regarded as a leading indicator of individual and public health (Meyer et al., 2001). However, sufficiently large samples and reliable instruments are needed to estimate small effects with potential large societal benefits precisely (Kretzschmar & Gignac, 2019).

Recent studies have employed larger samples and longer questionnaires, but influential older research was based on small samples and unreliable measures (see Lodi-Smith & Roberts, 2007). Few studies use peer-reports or life data, and few examine the links between personality traits and civic engagement across demographic sub-samples. Mixed results and inaccurate conclusions may hence be due to power issues, common method bias, and a lack of consideration for important sociodemographic moderators and covariates.

1.3 | The present study

This preregistered study examined the links between Big Five personality traits and six civic engagement indicators using three features to improve upon previous research. First, we measured both broad Big Five domains and lower-order aspects. Second, we investigated differences across age groups. Third, we used reliable measures across two large samples, collected data about potentially relevant sociodemographic moderators, and exploratorily compared self- and peer-reports.

We conducted specification curve analyses to estimate the range of possible effects and differential effects in specific life stages and sub-samples. We specified multiple hypotheses in our preregistration for sample 1 (<https://osf.io/vt5e3/>) based on theory and existing research. After analyzing the data from sample 1, we found that some hypotheses were not supported. Therefore, we added an addendum to our preregistration before recruiting and analyzing sample 2 (<https://osf.io/j7qvq/>). The addendum included modified hypotheses and a new analysis plan to cross-validate our findings from sample 1 in sample 2. We do not reiterate specific hypotheses here but rather estimate and discuss the effects of every pairing of Big Five personality traits and civic engagement indicators below.

2 | MATERIALS AND METHODS

2.1 | Sampling and procedure

This study used two samples: the *U.S. benchmark sample* ($n_1 = 1000$ self-reports) and the *U.K. cross-validation*

sample ($n_2=593$ self-reports and $n_2^*=312$ peer-reports). We based the sample sizes on a priori power analysis simulations, indicating the need for approximately 600 participants to predict small effects ($\rho\approx 0.10$) with a power of 0.80 (<https://osf.io/vt5e3/>). Participants were recruited through Prolific and paid \$7.50 per hour, with the option to skip individual items or questions. Prolific ensures high data quality by different measures, such as preventing duplicate participation, screening for suspicious activities, and banning bots (see <https://researcher-help.prolific.co/hc/en-gb/articles/360009092774-How-does-Prolific-prevent-duplicate-participant-accounts->). Sample sizes reported here differ slightly from those in the addendum to our preregistration due to exclusion of participants who only selected two response options, answered more than one item per second, or could not be matched to their peers.

The *U.S. benchmark sample* ($n_1=1000$) included 487 women and 510 men (three nonconforming/other) with $M_{\text{Age}}=47.00$ years, $SD_{\text{Age}}=18.74$ years, and $\text{Range}_{\text{Age}}=18-90$ years. Participants were distributed equally across younger adults (18–34 years; 337 participants), middle-aged adults (35–64 years; 336 participants), and older adults (65–90 years; 327 participants). We selected participants to approximate the simplified U.S. census according to gender, age, and ethnicity.

The *U.K. cross-validation sample* was a convenience sample of the U.K. population ($n_2=593$) for which we partially obtained peer-reports about the Big Five personality traits from participants' spouses or romantic partners ($n_2^*=312$). It included 295 women and 297 men (one nonconforming/other) with $M_{\text{Age}}=36.03$, $SD_{\text{Age}}=10.11$ years, and $\text{Range}_{\text{Age}}=18$ to 63 years. Participants were distributed equally across younger adults (18–34 years; 309 participants) and middle-aged adults (35–64 years; 284 participants), but the sample did not include older adults (65–90 years).

2.2 | Measures¹

2.2.1 | Big Five domains and aspects

We measured Big Five domains and aspects with the *Big Five Aspect Scales* (BFAS; DeYoung et al., 2007). The scales include 100 five-point Likert scale items (1 = “very inaccurate” to 5 = “very accurate”). These items are distributed equally across five domains and 10 corresponding aspects: Agreeableness (Compassion, Politeness), Extraversion (Assertiveness, Enthusiasm), Conscientiousness (Industriousness, Orderliness), Neuroticism (Volatility, Withdrawal), and Openness/Intellect (Openness, Intellect). In this study, the median of McDonald's (1978) omega total was

0.90 ($0.79\leq\omega_t\leq 0.96$) across all domains, aspects, and samples. The median self-peer correlation of the U.K. cross-validation sample was 0.56 ($0.43\leq r\leq 0.64$) across all domains and aspects.

2.2.2 | Civic engagement

We measured civic engagement with 11 questions across the six civic engagement indicators volunteerism, charitable giving, donating blood, posthumous organ donation, voting, and vaccination. The specific questions are shown in Figures 1 and 2. They included nine dichotomous questions to measure past civic engagement (“have you ever...?”) and two continuous questions to measure the frequency or amount of volunteerism and charitable giving specifically (“how often/how much...?”). Notably, we only measured this frequency or amount in participants who stated that they had ever volunteered for or donated to charity before. Accordingly, positive links between personality traits and these continuous questions do not imply that people scoring high in these traits also volunteer more days or donate more money to charity. Instead, they imply that people who should already be considered volunteers or donors volunteer or donate more than those scoring low in these traits. Similar questions were used in the most recent, large-scale studies about the correlations between Big Five domains and civic engagement (e.g., Ackermann, 2019; Furnham & Cheng, 2019; Halstead et al., 2022).

2.2.3 | Sociodemographic variables

We operationalized participants' life stages by sorting them into groups according to their age (younger adults: 18–34 years; middle-aged adults: 35–64 years; older adults: 65–90 years). We preregistered analyzing age demographics in terms of life stages for two reasons. First, individuals who are experiencing the same life stage often face similar challenges, making it possible to group them together based on aging-related changes and societal expectations (Erikson, 1959; Freund & Baltes, 2002). In the literature, various thresholds and models have been proposed to determine the age at which individuals transition from one life stage to another, but this study focuses on the three that have been most extensively studied (e.g., Costa & McCrae, 1976; Freund & Blanchard-Fields, 2014; Nye et al., 2016). Therefore, they should be a good framework that allows for comparing our findings with those from other studies examining the links between personality and various outcomes. Second, to investigate measurement

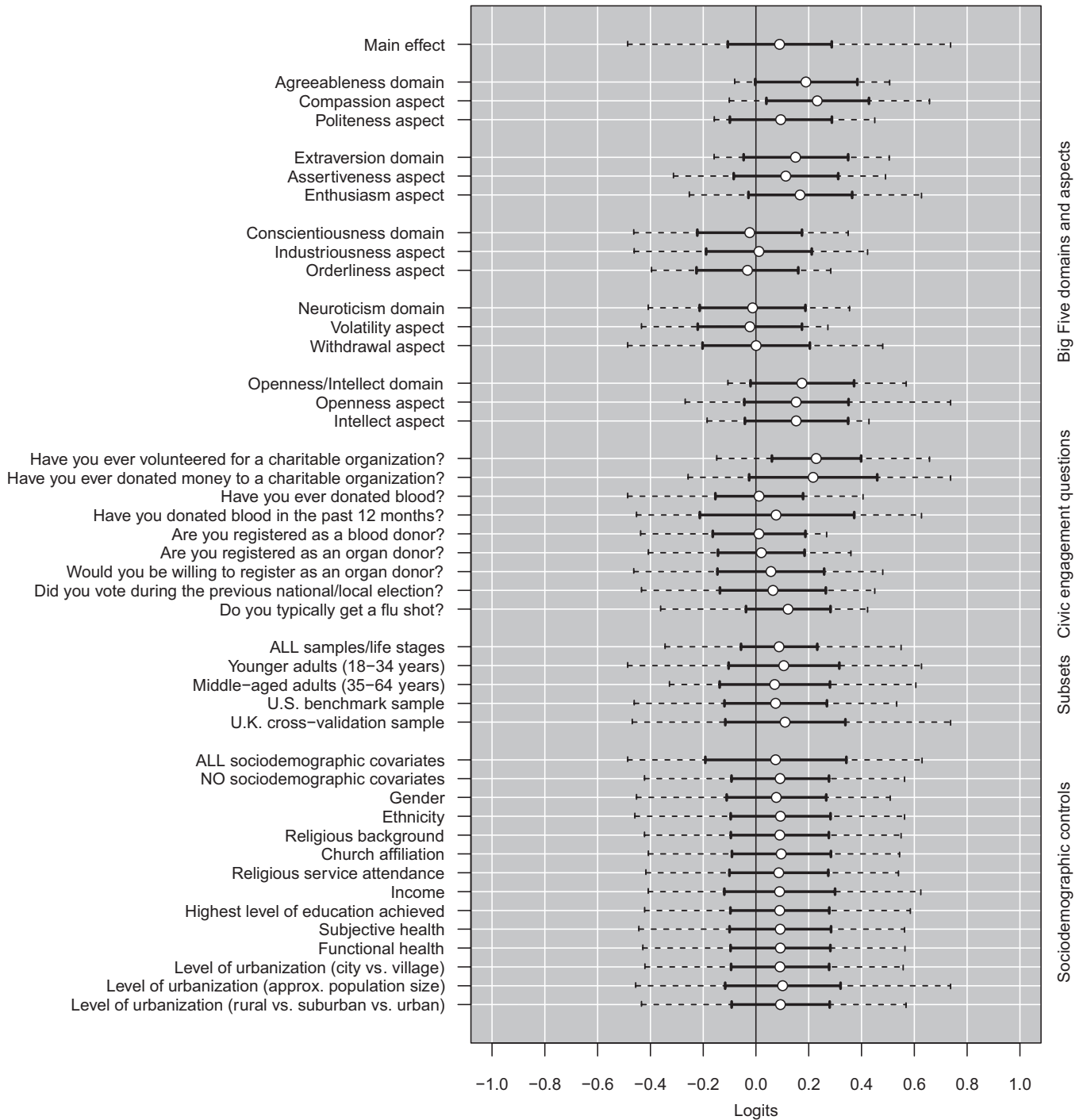


FIGURE 1 Specification curve analysis of the links between Big Five domains and aspects and nine dichotomous civic engagement questions across different life stages, samples, and sociodemographic controls. Rows include mean effect sizes (circles), 95% confidence intervals (solid lines), and ranges (dashed lines) across specifications. The individual statistics, including the means, 95% confidence intervals, and ranges across specifications, are available on OSF (<https://osf.io/5d8w3>, Sheet S2).

invariance, data must be grouped into categories, and using these life stages provides a meaningful way of comparing groups. Therefore, categorizing the data in this way aided in comparing the results of our study with those of others. However, we also report results treating age as a continuous variable on OSF (see <https://osf.io/5d8w3>, Sheets S14–S15).

We additionally measured participants' gender (1 = Male, 2 = Female, 3 = Nonconforming/other), ethnicity ("What is your ethnicity?" 1 = White, 2 = Hispanic, 3 = Black, 4 = Asian, 5 = American Indian or Alaskan Native, 6 = Native Hawaiian or other Pacific Islander, 7 = Other), religious background ("Were your parents involved in a church when you were 15 years

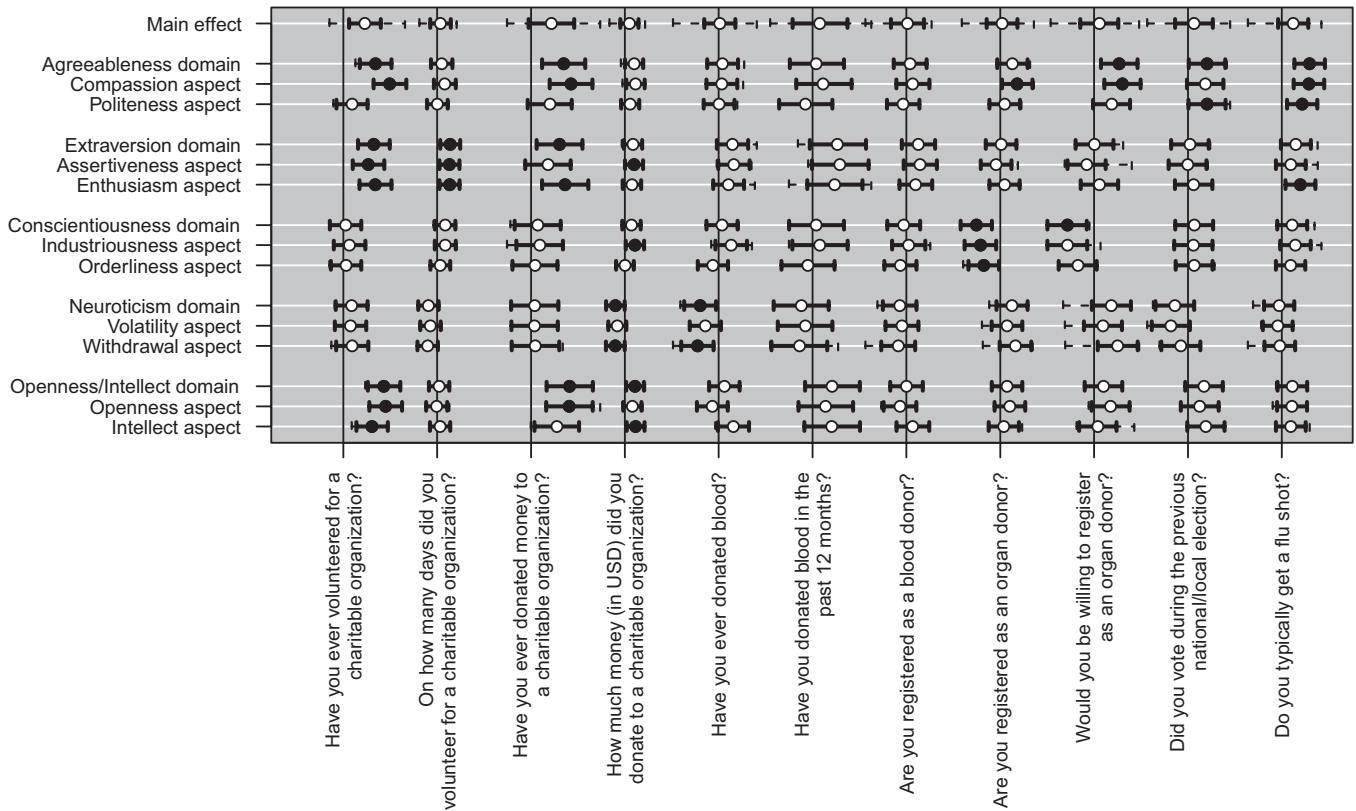


FIGURE 2 Specification curve analyses for different civic engagement questions across different life stages, samples, and sociodemographic controls. Rows include mean effect sizes (circles), 95% confidence intervals (solid lines), and ranges (dashed lines) across specifications. Solid circles depict that the range of effect sizes did not include zero. The individual statistics, including the means, 95% confidence intervals, and ranges across specifications, are available on OSF (<https://osf.io/5d8w3>, Sheet S3).

old?” 1 = no/2 = yes), church affiliation (“Currently, what is your confession or religion?” 1 = No affiliation, 2 = Protestant, 3 = Roman Catholic, 4 = Jewish, 5 = Mormon, 6 = Muslim, 7 = Hindu, 8 = Buddhist, 9 = Shinto, 10 = Other), attendance of religious services (“How frequently do you take part in religious services?”, 1 = never, 2 = a few times a year, 3 = about once a month, 4 = every two weeks, 5 = once a week, 6 = several times a week), income (“What is your personal monthly net income in USD?”), and the highest level of education achieved (“What is the highest degree or level of education you have completed?” 1 = No degree, 2 = Some high school, 3 = High school, 4 = Bachelor’s degree, 5 = Master’s degree, 6 = PhD or comparable, 7 = Trade school). Participants also reported on their subjective health (“How satisfied are you with your health”, Likert scale: 1 = “not at all” to 11 = “very much”), functional health (“To what extent do health issues make everyday activities such as housework, work, or leisure activities difficult”, Likert scale: 1 = “not at all” to 11 = “very much”), and the level of urbanization of their current place of residence (“Do you live in a city or village?” 1 = City/2 = Village, “What is the approximate population size of your current place of residence?”, open

response, “How would you describe your place of living?” 1 = Rural, 2 = Suburban, 3 = Urban).

2.3 | Analysis

We conducted all analyses in R using the packages *arm*, *dplyr*, *lavaan*, *lme4*, *psych*, *semTools*, and *specr* (Bates et al., 2021; Gelman & Su, 2021; Jorgensen et al., 2021; Masur & Scharnow, 2020; R Core Team, 2021; Revelle, 2021; Rosseel et al., 2021; Wickham et al., 2021).

2.3.1 | Data preparation

To assess measurement invariance across our samples and life stages, we followed recommended cutoffs and found strict invariance for the Big Five domains and aspects (see Cheung & Rensvold, 2002). However, we did not find strict invariance between self- and peer-report samples or for older adults. Specifically, we observed configural and metric invariance but not scalar invariance, which suggests that any comparisons made could be biased. Moreover, the sample sizes for peer-reports (312)

and older participants (327) did not meet the predetermined number in our a priori power analysis. Therefore, we focused on self-reports from younger and middle-aged adults for the primary analysis. However, we did perform exploratory analyses using peer-reports and older adult data. For subsequent analyses, we used the standardized latent variable scores derived from the strict invariance models (see <https://osf.io/62twm>). We used the raw civic engagement scores as submitted by the participants because their latent structure is unclear, and we could not specify a measurement model.

We recoded sociodemographic variables and excluded rare cases for analysis, such as participants who did not conform to binary gender classification ($n=4$), which we marked as missing and excluded pairwise. Another example involves the compression of church affiliations into three groups due to the small number of participants who identified as Muslims ($n=27$) or Jews ($n=11$). The complete list of changes to sociodemographic variables is available on OSF, along with descriptive statistics and zero-order correlations between study variables (see <https://osf.io/62twm> and <https://osf.io/5d8w3>, Sheets S12–S13).

2.3.2 | Specification curve analyses

We used specification curve analysis to estimate the robustness of the links between Big Five personality traits and civic engagement across different samples and models, either with or without sociodemographic variables. Specification curve analysis is an ensemble method that involves estimating, aggregating, and comparing effect sizes across all possible combinations of predictors, outcomes, subsets, and covariates (see Simonsohn et al., 2020). It has been used in recent personality research, for example, to estimate the robustness of the links between Big Five personality traits and important life outcomes, such as mortality and unemployment, while controlling for several background variables (Beck & Jackson, 2022).

We estimated 11,550 effect sizes by conducting logistic regression for dichotomous questions and linear regression for continuous questions and then aggregated the effect sizes on three levels. The first level involved aggregating effect sizes for specific predictors, outcomes, samples, or covariates to gauge the general predictive power of Big Five personality traits and the general predictability of our civic engagement questions. The second level involved aggregating effect sizes for all combinations of predictors and outcomes to gauge the individual predictive power of a specific Big Five domain or aspect in explaining the response to a specific civic engagement question while controlling for different sociodemographic variables. Finally,

we inspected effect sizes for all combinations of predictors and outcomes in the two available samples and life stages to gauge the individual predictive power of a specific Big Five domain or aspect in explaining the response to a specific civic engagement question in a specific sample or life stage while controlling for different sociodemographic variables.

We used the mean, 95% confidence interval, and range as summary statistics to analyze effect sizes. For aggregated effect sizes, we used the range to determine robustness. For individual effect sizes, we used the 95% confidence interval to decide the significance. An aggregated effect size was considered robust if its range did not overlap with 0. An individual effect size was considered significant if its 95% confidence interval did not overlap with 0. Effect sizes were considered different if the 95% confidence interval of one did not include the point estimate of the other when comparing different individual effect sizes. We used the range when deciding whether aggregated effect sizes were robust because the meaning of confidence intervals for aggregated effect sizes is unclear (Frey et al., 2021; Hoekstra et al., 2014). Our use of the range as a criterion for robustness was strict but should increase the likelihood of replication in future studies.

3 | RESULTS

3.1 | General links between Big Five personality traits and civic engagement

Our first goal was to depict the range of effects that could occur in studies of associations between personality traits and civic engagement (Figure 1; additional figures and results available at <https://osf.io/w4j5e> and <https://osf.io/5d8w3>, Sheet S2). There were three main findings. First, the average effect sizes of the links between the Big Five personality traits and civic engagement across specifications were small to medium-sized, highlighting the importance of well-powered studies. Second, the ranges of possible effects were quite large. Expressed as Pearson correlation, the main effect was $r=0.02$, 95% CI $[-0.03, 0.08]$, $Range=-0.13$ to 0.20. In absolute values, it was $r=0.04$, 95% CI $[0.05, 0.08]$, $Range=0.00$ to 0.20. These results help explain the variability in previous results reported in the literature by suggesting that the answer to the question, how do personality traits relate to civic engagement behavior, depends a lot on how the question is asked and what design is used to answer it.

Third, varying the Big Five personality traits and civic engagement questions across models had a stronger effect on the effect sizes compared to varying subsets and sociodemographic controls. Random-effects decomposition

showed that around half of the effect size variance was explained by varying the Big Five personality traits ($ICC = 26.82\%$, 95% CI [15.67%, 44.76%]) and civic engagement questions ($ICC = 21.55\%$, 95% CI [10.22%, 43.67%]). Varying subsets ($ICC = 0.97\%$, 95% CI [0.30%, 5.34%]) and sociodemographic variables ($ICC = 0.00\%$, 95% CI [0.00%, 0.27%]) had a negligible effect on the effect size variance. These findings suggest that the main source of variation is which traits are used to predict which civic engagement behavior. Different life stages, samples, and sociodemographic variables have limited effects on the links between the Big Five personality traits and civic engagement.

It follows that there were some specific associations between some Big Five personality traits and some civic engagement questions. For example, the Big Five aspect Compassion had the largest effect size across all dichotomous civic engagement questions ($r = 0.06$, 95% CI [0.01, 0.12], $Range = -0.03$ to 0.18), whereas Assertiveness had the largest effect size across both continuous civic engagement questions ($\beta = 0.11$, 95% CI [0.01, 0.22], $Range = 0.01$ to 0.22). On the other hand, the civic engagement question "Have you ever volunteered for a charitable organization?" had the largest effect size across all Big Five personality traits ($r = 0.06$, 95% CI [0.02, 0.11], $Range = -0.04$ to 0.18).

3.2 | Associations between specific Big Five personality traits and specific civic engagement questions

Our second goal was to test preregistered hypotheses about how specific Big Five traits relate to specific civic engagement questions. Figure 2 shows 11 individual specification curve analyses (one for each question) on Big Five domains and aspects aggregated across samples, sociodemographic controls, and life stages. The individual statistics, including the means, 95% confidence intervals, and ranges across specifications, are available on OSF (<https://osf.io/5d8w3>, Sheet S3).

Agreeable participants reported a higher likelihood of having ever volunteered for a charitable organization ($r = 0.09$, 95% CI [0.05, 0.14], $Range = 0.04$ to 0.14), having ever donated money to a charitable organization ($r = 0.10$, 95% CI [0.03, 0.16], $Range = 0.03$ to 0.16), being willing to register as an organ donor ($r = 0.07$, 95% CI [0.02, 0.13], $Range = 0.02$ to 0.13), having voted during the previous election ($r = 0.06$, 95% CI [0.00, 0.11], $Range = 0.00$ to 0.11), and typically getting a flu shot ($r = 0.09$, 95% CI [0.05, 0.14], $Range = 0.04$ to 0.14). Both aspects mirrored the higher likelihood of typically getting a flu shot. However, in all but one of the other civic engagement questions, only Compassion emerged as a significant predictor across specifications. The exception was the likelihood

of having voted during the previous election, where only Politeness emerged as a significant predictor across specifications. Compassion was also uniquely linked with the likelihood of actually being registered as an organ donor, while Agreeableness was not ($r = 0.05$, 95% CI [0.01, 0.09], $Range = 0.01$ to 0.10).

Extraverted participants reported a higher likelihood of having ever volunteered for a charitable organization ($r = 0.09$, 95% CI [0.04, 0.14], $Range = 0.04$ to 0.14) and having ever donated money to a charitable organization ($r = 0.08$, 95% CI [0.02, 0.15], $Range = 0.02$ to 0.15). They also reported having volunteered on more days for a charitable organization in the past 12 months ($\beta = 0.13$, 95% CI [0.03, 0.24], $Range = 0.03$ to 0.24). Both aspects mirrored the higher likelihood of having ever volunteered for a charitable organization and having spent more days volunteering in the past 12 months. However, only Enthusiasm emerged as a significant predictor of the likelihood of having ever donated money to a charitable organization. Enthusiasm was also uniquely linked with the likelihood of typically getting a flu shot, while Extraversion was not ($r = 0.05$, 95% CI [0.01, 0.10], $Range = 0.01$ to 0.10). On the other hand, Assertiveness was uniquely linked to having donated more USD in the past 12 months ($\beta = 0.10$, 95% CI [0.00, 0.19], $Range = 0.00$ to 0.19).

Conscientious participants reported a lower likelihood of being willing to register as an organ donor ($r = -0.08$, 95% CI [-0.14, -0.02], $Range = -0.14$ to -0.01) and actually being registered as one ($r = -0.07$, 95% CI [-0.12, -0.02], $Range = -0.12$ to -0.02). Both aspects mirrored the lower likelihood of being registered as an organ donor. However, only the Conscientiousness domain emerged as a significant predictor of the likelihood of being willing to register as an organ donor. In contrast, Industriousness was uniquely linked to having donated more USD in the past 12 months ($\beta = 0.11$, 95% CI [0.01, 0.21], $Range = 0.01$ to 0.21).

Neurotic participants reported a lower likelihood of having ever donated blood ($r = -0.05$, 95% CI [-0.10, -0.01], $Range = -0.11$ to -0.01). They also reported having donated fewer USD in the past 12 months ($\beta = -0.10$, 95% CI [-0.20, -0.00], $Range = -0.20$ to -0.00). Only Withdrawal emerged as a significant predictor of these two civic engagement questions.

Open/intellectual participants reported a higher likelihood of having ever volunteered for a charitable organization ($r = 0.12$, 95% CI [0.07, 0.16], $Range = 0.06$ to 0.16) and having ever donated money to a charitable organization ($r = 0.11$, 95% CI [0.05, 0.18], $Range = 0.05$ to 0.18). They also reported having donated more USD in the past 12 months ($\beta = 0.11$, 95% CI [0.01, 0.20], $Range = 0.01$ to 0.21). Both aspects mirrored the likelihood of having ever volunteered for a charitable organization. However, only

Openness emerged as a significant predictor of the likelihood of having ever donated money to a charitable organization ($r=0.11$, 95% CI [0.04, 0.18], *Range*=0.04 to 0.20). Conversely, only Intellect was linked to having donated more USD in the past 12 months ($\beta=0.11$, 95% CI [0.02, 0.21], *Range*=0.01 to 0.21).

In sum, Agreeableness, Extraversion, Openness/Intellect, and many of their aspects emerged as positive predictors of several civic engagement questions, except for those pertaining to blood donations. Conscientiousness, Neuroticism, and their aspects emerged as negative predictors of some civic engagement questions, especially those pertaining to blood and organ donations. Big Five aspects were important in many of these links, which suggests that considering them is crucial when attempting to understand what drives these links.

3.3 | Moderation analyses

3.3.1 | Differences between younger, middle-aged, and older participants

Our third goal was to examine differential effects in specific life stages and sub-samples. Specification curve analyses suggested no systematic effects, but certain couplings may still be important. Results of regressions of civic engagement questions on Big Five domains and aspects for younger (18–34 years) and middle-aged adults (35–64 years), with and without sociodemographic controls, are available on OSF (<https://osf.io/5d8w3>, Sheets S4 and S5). Stronger links between Big Five personality traits and dichotomous civic engagement questions were observed in younger adults, while stronger links with continuous civic engagement questions were found in middle-aged adults, both positively and negatively.

We also explored differences between younger (18–34 years), middle-aged (35–64 years), and older adults (64–90 years) in the U.S. benchmark sample. Results of regressions, with and without sociodemographic controls, are available on OSF (<https://osf.io/5d8w3>, Sheets S6 and S7). Overall, links between Big Five personality traits and civic engagement questions were weaker in older adults than in middle-aged and young adults, with some exceptions. Blood donation and flu shot likelihoods had stronger links in younger and older adults than in middle-aged adults. Additionally, extraverted younger participants were less willing to register as organ donors, while extraverted older participants were more willing to do so. These findings suggest that life stage moderates some links, which are often strongest in younger adults. However, caution is necessary when

interpreting findings about older adults due to their small sample size (Median $n=327$).

3.3.2 | Differences between U.S. American and U.K. participants, including self-reports and peer-reports

Finally, we explored differential effects between U.S. and U.K. samples and across self- and peer-report data. Results of regressions for U.S. and U.K. participants, with and without sociodemographic controls, are available on OSF (<https://osf.io/5d8w3>, Sheets S8 and S9). Few differences were found between the samples, but some links between Big Five personality traits and civic engagement were stronger for U.K. participants, particularly in flu shot likelihood. Exceptions were found for the two continuous civic engagement questions, where agreeable U.S. participants volunteered more and donated more money to charity than U.K. participants.

4 | DISCUSSION

Theory and initial evidence suggest that personality traits are important predictors of civic engagement (e.g., Bekkers, 2006; Graziano & Tobin, 2009; Mondak et al., 2010). However, different studies have yielded different results, and the directions and magnitudes of effects were often unclear. This preregistered study used specification curve analyses to show that different approaches to estimating associations between personality traits and civic engagement behaviors can lead to a wide range of effects. By parsing Big Five trait domains and trait aspects, different civic engagement indicators, life stage, and sociodemographic controls, we found small but robust links between Big Five traits and six forms of civic engagement: volunteerism, charitable giving, donating blood, posthumous organ donation, political voting, and vaccination.

The present pattern of results implies that the mixed evidence of previous studies may be best explained by a lack of statistical power in many of the earlier studies, in addition to the differential effects of lower-order traits and the moderating role of life stages. The small effect sizes found in this study highlight the need for large sample sizes and reliable measures to better understand associations between traits and civic engagement (see Kretzschmar & Gignac, 2019). Previous studies were often limited to one country and relied on self-reports, whereas this study recruited participants from the United States and United Kingdom and exploratorily analyzed peer-reports. Our results suggest that some of the links also

replicate in the smaller sample of peer-report data, but a more comprehensive analysis would be needed to systematically account for the common method variance in these correlations.

4.1 | Aspects and the life stage are important in some couplings of traits and civic engagement

Overall, the trait domains Agreeableness, Extraversion, and Openness/Intellect were positive predictors of all civic engagement indicators except blood donations. The trait domains Conscientiousness and Neuroticism were negative predictors of blood and organ donations.

The Big Five aspects drove various links. Compassion explained Agreeableness's positive link with volunteering, charitable giving, and organ donations. Politeness explained Agreeableness's link with voting. Enthusiasm, but not Assertiveness, was linked to donating to charity and getting a flu shot. Assertiveness and Industriousness were linked to donating more money to charity. Withdrawal, but not Volatility, was linked to donating less money to charity and blood. Openness was linked to donating money, while Intellect was linked to donating more money. These differential findings support the consideration of lower-order traits when estimating links between trait domains and civic engagement.

Life stage moderated some links between Big Five personality traits and civic engagement. Younger adults (18–34 years) were more likely to be linked with health-related civic engagement, while middle-aged adults (35–64 years) were more likely to be linked with the amount of money donated to charity. These findings suggest that personality traits become more relevant as adults enter life stages that provide them with the necessary time and resources to engage in behavior that reflects their personality (see Freund & Blanchard-Fields, 2014; McAdams, 2001). Younger adults may have more time for time-consuming but costless behaviors, like donating blood, while middle-aged adults may have more money for generous but less time-consuming behaviors, like donating to charity.

4.2 | Theoretical implications

We found the expected positive links between Agreeableness, Extraversion, Openness/Intellect, and civic engagement, supporting previous research (see Bekkers, 2006; Habashi et al., 2016; Smillie et al., 2019). This emphasizes the importance of considering these personality traits in developing civic engagement (see

Bleidorn et al., 2019; Flanagan & Levine, 2010; Pratt & Lawford, 2014). We also found expected negative links between Neuroticism and civic engagement, but not for formal/public activities like volunteering (see Ackermann, 2019; Ferguson, 2004; Halstead et al., 2022). These results corroborate that this personality trait, and especially its Withdrawal aspect, is associated with social and economic costs (Cuijpers et al., 2010).

Including lower-order traits can help resolve contradictory results, as shown in recent studies (Gibbon & Douglas, 2021; Hopwood, Lenhausen, et al., 2022; Zhao et al., 2017). Compassion may drive the links between Agreeableness and civic engagement, as argued by several theorists (Bekkers, 2006; Graziano & Eisenberg, 1997; Smillie et al., 2019), and our study supports this conclusion. In line with these papers, we conclude that considering age-graded trends and including measures of Big Five aspects and other lower-order traits can help entangle otherwise conflicting results.

4.2.1 | The case of Conscientiousness

Associations between Conscientiousness and civic engagement were surprising. In contrast to theory and some research, this trait was not positively linked with voting and vaccination and negatively linked with health-related civic engagement (Gerber et al., 2011; Mondak et al., 2010; Mondak & Halperin, 2008). This contradicts a large body of literature claiming positive links, but our study was not the first to find adverse evidence (e.g., Denny & Doyle, 2008; Gallego & Oberski, 2012). We offer two possible explanations for these findings.

First, different scales measuring the Big Five personality traits can vary in the content they include, which may explain why the expected positive link between Conscientiousness and civic engagement was not found (see Crowe et al., 2018; Schwaba et al., 2020). While some scales may include items that fit with the assumption that conscientious people are dutiful and organized, others, such as the Big Five Aspects Scales used in this study, may not (DeYoung et al., 2007). In this measure, compliance with governmental laws and ethical norms may be more closely linked to the Politeness aspect of Agreeableness, which we found associated with voting in this study (see Costa & McCrae, 1995; DeYoung et al., 2007). The choice of the measure used to assess personality traits may therefore influence whether a link between Conscientiousness and civic engagement is found.

Second, while we did not find robust evidence for a link between Conscientiousness and political voting or

vaccination across all samples and subgroups, individual effect sizes of the link with vaccination were positive and significant in some cases, such as in the U.K. sample. Ranking the effect sizes in descending order shows that they are also larger when subjective health, population size, functional health, education, and gender are added to the model. Heterogeneity in the effect sizes across different sociodemographic variables may hence be another explanation for the lack of a general effect.

4.3 | Practical importance of personality traits for civic engagement

Although the correlations between personality traits and civic engagement are generally small, they can still have an important effect on human well-being (Funder & Ozer, 2019). In our study, regular donors scoring 1 SD higher than average in Extraversion donated at least 13.62% more to charity. Extraversion is a desirable trait, and many people want to become more extraverted (Hudson & Roberts, 2014; Thielmann & de Vries, 2021). If only 1% of the roughly 291.6 million U.S. residents who had ever donated to charity increased by 1 SD in Extraversion, we would expect donations to increase by 92.9 million USD (2.9 million \times 32.05 USD).

Although other personal and environmental factors are also important, the relative malleability and breadth of personality traits may make them particularly well-suited targets for interventions aimed at developing civic engagement (Bleidorn et al., 2019; Roberts et al., 2007; Wiepking & Bekkers, 2012). In sum, our results may encourage teachers, parents, and policymakers to consider personality traits when trying to promote the behaviors that serve their societies.

4.4 | Limitations

Our study has five main limitations. First, we only examined the association between personality and civic engagement in two specific countries, so generalization to other populations may not be possible. Patterns of both personality and civic behavior are highly contextualized, and we may not expect these results to generalize to other parts of the world. These findings may also not generalize to certain subgroups within the countries we did examine.

Second, the lack of data from older adults (65–90 years) in the U.K. cross-validation sample limited our analysis of differences between younger (18–34 years), middle-aged (35–64 years), and older adults. Although our results suggest that personality traits are generally less important than in younger adults when predicting civic engagement,

we may have missed some important links due to the small sample size. The small sample size of the U.K. peer-report sample and the lack of measurement invariance between self-report and peer-report samples also limit our findings.

Third, although the Big Five aspects have been shown to be sensitive to individual differences in civic engagement, a more comprehensive list of lower-order traits, such as the NEO facets, may provide an even more nuanced understanding (Costa & McCrae, 1995). The purpose of this study was not to compare aspects with facets but to demonstrate the benefits of distinguishing between lower-order traits. Nonetheless, future research could benefit from incorporating measures that facilitate even greater differentiation, thereby enhancing the predictability of civic engagement.

Fourth, although we analyzed the links between personality traits and the six most important civic engagement indicators in the literature, other activities, such as sustainable behaviors, eating a healthy diet, or raising a child, have been proposed as belonging to the civic engagement category (e.g., Lin, 2015; Mockenhaupt & Woodrum, 2015; Pesch et al., 2019). While we focused on the most frequently studied indicators, our operationalization of civic engagement may not have been exhaustive, and future research may benefit from examining additional activities.

Fifth, self-reports are imperfect measures of civic engagement (see Adler & Goggin, 2005; Zaff et al., 2011). Moreover, most studies rely on ad hoc measures or available panel data and use self-reports to assess charitable giving, either through hypothetical scenarios, past behavior, or attitudes and intentions (Bekkers, 2010; Brown & Taylor, 2015; Ha et al., 2013; Habashi et al., 2016). Well-validated measures that may be more objective, such as peer-ratings or observational studies, are rarely used. These methodological issues may be another factor that contributes to the previously mixed evidence in the literature but are beyond the scope of this study.

5 | CONCLUSION

Our study confirms that Big Five personality traits are significant predictors of civic engagement, albeit with small effect sizes. To more accurately estimate these links, researchers should consider the effects of lower-order traits, life stages, and other relevant sociodemographic and methodological factors. Further research should focus on identifying environmental factors that influence the correlations between personality traits and civic engagement. Together, this knowledge should help teachers, parents, and policymakers to foster the behaviors that best serve society.

AUTHOR CONTRIBUTIONS

A.G.S., W.B., and C.J.H. contributed to conceptualization, methodology, and writing—review and editing. A.G.S. contributed to software, validation, formal analysis, investigation, resources, data curation, visualization, and project administration. A.G.S. and W.B. contributed to writing—original draft. W.B. and C.J.H. contributed to supervision. W.B. contributed to funding acquisition.

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CONFLICT OF INTEREST STATEMENT

The authors declare that this study was conducted without personal, commercial, or financial relationships that could be construed as a potential conflict of interest.

DATA AVAILABILITY STATEMENT

The materials, datasets, and code files generated in this study can be found in our designated OSF project: <https://doi.org/10.17605/OSF.IO/MQ2N5>. The usage of these files is restricted under Creative Commons Attribution 4.0 International Public License.

ETHICS STATEMENT

This study has been approved by the Ethics Committee of the Faculty of Philosophy at the University of Zurich (Approval No. 21.10.2). All participants provided informed consent before participation.

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ENDNOTE

¹ This study reports results for part of the measures included in the preregistration (see <https://osf.io/vt5e3/>). We additionally included several other variables (see <https://osf.io/7mr6d/>); results using these measures will be reported in different publications.

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