Article

Digital Citizenship and the Big Five Personality Traits

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Abstract: Over the past two decades, the internet has become an increasingly important venue for political expression, community building, and social activism. Scholars in a wide range of disciplines have endeavored to understand and measure how these transformations have affected individuals' civic attitudes and behaviors. The Digital Citizenship Scale (original and revised form) has become one of the most widely used instruments for measuring and evaluating these changes, but to date, no study has investigated how digital citizenship behaviors relate to exogenous variables. Using the classic Big Five Factor model of personality (Openness to experience, Conscientiousness, Extroversion, Agreeableness, and Neuroticism), this study investigated how personality traits relate to the key components of digital citizenship. Survey results were gathered across three countries ($n = 1820$), and analysis revealed that personality traits map uniquely on to digital citizenship in comparison to traditional forms of civic engagement. The implications of these findings are discussed.

Keywords: digital citizenship; measurement; personality traits; OCEAN; online activism

1. Introduction

Over the past two decades, the internet has emerged as an indispensable platform for political expression, community building, and social activism, witnessing a remarkable surge in its significance. During that time, conventional approaches to civic engagement have experienced a decline in participation rates [1–3]. Consequently, scholars in a wide range of disciplines have endeavored to understand the implications of these transformations for political and social life and how to measure these changed behaviors. One construct that has proved particularly valuable in this regard is that of digital citizenship.

Citizenship, a concept with deep historical roots dating back to Plato and Aristotle, has generally been understood as a shared set of expectations about how members of a society engage in the political realm [4]. However, in the last two decades, the emergence of digital citizenship as a new research concept has introduced a fresh perspective to the study of citizenship, one which has primarily captured the attention of scholars in education and media studies [5].

Digital citizenship has principally been associated with teaching (and evaluating) computer literacy, responsible online behavior, and appropriate technology usage within K-12 settings [6,7]. According to a recent literature review [8], this formulation continues to be the most prevalent interpretation of digital citizenship. While this approach has value, scholars like Emejulu and McGregor [9] argue that its emphasis on tool literacy fails to provide a critical understanding of individuals' social relationships with technology and the digital realm. In fact, they assert that it conceals and suppresses the underlying politics inherent in citizenship as a concept. Similarly, Heath also highlights that the focus on skills and responsibility restricts its potential to fulfill the fundamental purpose of public schooling in a democratic society: nurturing active citizens [10].

A crucial step forward involves conceptualizing digital citizenship in a manner that enables researchers to assess (and educators to advocate for) individuals' political engagement within their communities through online platforms. As mentioned earlier, numerous scholars have contended that there has been an expansion in the modes of political participation during the past two decades. While traditional citizenship activities such as voting and political party volunteering are on the decline, newer forms of engagement such as product boycotts, protests, and community volunteering are gaining popularity, particularly among the younger generation. Additionally, digitally networked participation activities, including sharing political content online or signing online petitions, have emerged as a contemporary mode of political involvement that potentially replaces traditional forms of participation [11,12].

A groundbreaking contribution to the field of digital citizenship research was made by Choi, Glassman, and Cristol [13] with their 26-item Digital Citizenship Scale (DCS). Notably, this scale pioneered the explicit measurement of the emerging dimensions of criticality, political engagement, and activism within online environments. Building upon this work, Connolly and Miller [14] further advanced the instrument in *Informatics,* resulting in the development of a revised 19-item scale (DCS-R) that encompasses four distinct factors.

While there have been at least seven other studies that have measured digital citizenship using the DCS or DCS-R (see the literature review in Fernández-Prados, Lozano-Díaz, and Ainz-Galende [15]), none have investigated how exogenous factors impact digital citizenship measures. This study builds on the emerging DCS/DCS-R literature by examining, for the first time, the relationship between personality traits and digital citizenship behaviors using a survey population (*n* = 1820) that includes both students and the general public from three different countries.

1.1. Revised Digital Citizenship Scale

The Digital Citizenship Scale (DCS) of Choi, Glassman, and Cristol [13] provided, for the first time, a survey instrument for assessing the abilities, perceptions, and levels of political participation of individuals in their online activities. Their 26-item questionnaire consists of five distinct factors: Internet Political Activism (IPA, 9 items), Networking Agency (NA, 4 items), Critical Perspective (CP, 7 items), Technical Skills (TS, 4 items), and Local/Global Awareness (LGA, 2 items). The study participants were from a midwestern American university, and a follow-up study by Choi, Cristol, and Gimbert [16] surveyed teachers in the United States.

Connolly and Miller [14] abbreviated the DCS into a 19-item scale in order to achieve validity across generations and nationalities. Their Revised Digital Citizenship Scale (DCS-R) has four factors: Internet Political Activism (IPA, 6 items), Networking Agency (NA, 3 items), Critical Perspectives (CP, 7 items), and Technical Skills (TS, 3 items). For a complete list of items see Connolly and Miller [14].

The Internet Political Activism factor captures the various ways in which individuals experience active political life on the internet, such as signing online petitions, contacting government officials through online methods, or belonging to online groups focused on political or social issues. The Networking Agency factor measures an important aspect of digital citizenship: the degree to which one actively contributes to, rather than passively consumes, civic-oriented online content. Given the potential for online environments to present unreliable truth claims, the ability to think critically about online content is a crucial aspect of digital citizenship [17,18]. As such, the Critical Perspectives factor assesses the different ways an individual can reflect on the social and political nature of online environments. Finally, the Technical Skills factor measures participants' perceived self-efficacy in internet-based activities.

1.2. Personality Traits and Their Measurement

Trait-based personality research is premised on several assumptions: that traits exist and can be measured, that they vary across individuals, that they affect behavior and

opinion formation, and that these traits are reflected in the languages that are used by individuals to describe personality differences [19,20]. Lexical and factor analyses identified five cross-cultural traits: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. Collectively, they are referred to as the Big Five Factor Model or, more commonly, by the simple acronym OCEAN [21].

Openness refers to the degree to which an individual's cognitive processes are characterized by embracing diverse experiences. Individuals who exhibit high levels of openness are intellectually curious, open-minded, and actively seek out new ideas and novel experiences.

Conscientiousness pertains to an individual's ability to exercise self-control, follow social norms, and act in a goal-directed manner. Conscientious individuals tend to think before acting, display qualities such as planning and organization, and adhere to rules and responsibilities.

Extraversion reflects a preference for social interaction and an outward-oriented approach to life. Individuals high in extraversion perceive themselves as active and assertive and frequently seek out positive emotional experiences through social engagement.

Agreeableness represents a tendency to avoid conflict and a strong desire to be liked by others. Individuals high in agreeableness often exhibit prosocial, communal, and cooperative behaviors, and are commonly associated with kindness and considerate actions.

Neuroticism (sometimes referred to as its inverse, Emotional Stability) encompasses measures of temperament, nervousness, and susceptibility to experiencing negative emotions [22]. Individuals with low scores in the Neuroticism trait are less prone to stress and are generally regarded as emotionally stable.

As noted by Gerber, Huber, Doherty, and Dowling [20], these five traits "have predictive power in an impressive variety of domains but are not universal predictors of all outcomes" (p. 268). There are a wide variety of survey instruments for measuring these five traits, ranging from brief instruments such as the Ten-Item Personality Measure [23] and the 15-item BFI-2-XS [24] to instruments containing dozens or even hundreds of questions, such as the 60-item BFI-2 and the 300-item IPEP-NEO [20]. While the more expansive instruments are able to achieve better internal reliability, they are often impractical to use in surveys where other issues (such as political views, technological usage, or purchasing behaviors) are being measured. As such, it is common in these situations to use the briefer instruments. It should be noted, though, that in some areas, these abbreviated measures are more likely to result in smaller effect sizes in comparison to longer instruments [25]. Regardless, these instruments have been used in a wide range of domains, including within computing itself (e.g., see [26–30]).

1.3. Personality and Citizenship

There have been a substantial number of studies examining the relationship between personality traits and political preferences and/or voting intentions [31]. There have, however, been fewer that have looked more generally at the wider range of civic behaviors and attitudes collectively referred to as citizenship. While the meaning of citizenship can vary from nation to nation [32], there are significant commonalities, such as participation or engagement in civic activities, knowledge about government, commitment to order, and respecting the rights of others [4]. Research on the Big Five personality traits and citizenship in this broader understanding "has yielded inconsistent findings" [20] (p. 274) which vary as well across countries [33]. The existing literature addresses how personality affects political opinions with some breadth, but studies examining how personality affects behavior and efficacy, especially in online environments, remain scarce [34].

In the context of digital citizenship, the trait of Openness may influence the willingness to explore and adopt new digital technologies, engage in diverse online communities, and embrace innovative approaches to online collaboration. Conscientiousness may manifest in responsible online behavior, adherence to ethical guidelines, and the ability to manage one's digital presence effectively. Extraversion may influence digital citizenship in terms of

active participation in online communities, initiating and maintaining online relationships, and embracing social media platforms for networking and communication. The Agreeableness trait may have a negative correlation with political activity due to the preference toward conflict avoidance and a tendency toward low political efficacy [33], while higher levels of Neuroticism may be associated with negative online behaviors and experiences, such as cyberbullying and social media-induced anxiety. Table 1 summarizes the most recent research findings on the relationship between personality traits and various aspects of citizenship.

Table 1. Overview of research findings on OCEAN and citizenship *.

Study	O	C	E	A	N
Mondak, Hibbing, Canache, Seligson and Anderson [19] USA, Urug, Venz, BFI-10 Political Engagement	+	+	+		+
Gerber, Huber, Doherty and Dowling [20] USA, BFI-44 Voting		+			−
Political Interest	+	+	+	+	−
Ha, Kim and Jo [35] South Korea, BFI-10 Political Participation	+	+ and −		−	
Weinschenk [36] USA, BFI-10 Civic Duty	+	+	+	+	
Dinesen, Nørgaard and Klemmensen [37] Denmark, BFI-60 Civic Engagement	+		+	−	
Voting		+	+	+	
Lindell and Strandberg [38] Finland, BFI-10 Active Participation	+		+	−	
Deliberative Activities	+		+	−	
Russo and Amnå [22] Sweden, BFF-44 Internet Political Engagement	+	−	+	−	
Pruysers, Blais and Chen [39] Canada, HEXACO-60 Citizenship		+	+	+	
Civic Duty	−	−	+		−

* Cell entries indicate the sign on each regression coefficient in which relationships were found to be significant at $p < 0.05$.

1.4. The Current Study and Its Hypotheses

Increasingly, digital environments are replacing traditional arenas as active spaces for political activities and civic engagement. Investigating how personality traits are associated with different aspects of digital citizenship could result in a better understanding of the intentions, motivations, and behaviors of individuals in these online spaces. To this end, by analyzing data collected from adults in three countries, we strived to examine the relationship between the Five-Factor Model of personality and digital citizenship as measured by the DCS-R. The authors began with the following hypotheses, which are summarized in Table 2, and discussed in more detail below.

Table 2. Hypothesized relationships between digital citizenship factors and personality traits *.

Hypothesis	Dependent Variable	O	C	E	A	N
H1:	Internet Political Activism (IPA)	+	+	+	−	
H2:	Network Agency (NA)			+	−	
H3	Critical Perspectives (CP)	+	−		−	
H4	Technical Skills (TS)	+	+			

* Cell entries indicate the predicted sign on each regression coefficient in which relationships will be found to be significant at $p < 0.05$.

1.4.1. Hypothesis 1—Personality and Internet Political Activity (IPA)

Based on this previous research in this area (as shown in Table 1), the personality traits of Openness (O), Conscientiousness (C), and Extraversion (E) will be positively related to Internet Political Activism (IPA), and Agreeableness (A) will be negatively related to IPA. There should be no significant relationship between Neuroticism (N) and IPA.

1.4.2. Hypothesis 2—Personality and Network Agency (NA)

The trait of Extraversion (E) will be positively related to Network Agency (NA), while Agreeableness will be negatively related to NA. The other personality traits will not be significantly related to the factor of NA.

1.4.3. Hypothesis 3—Personality and Critical Perspectives (CP)

Since it measures subject's willingness to be critical towards society and towards the internet, Openness (O) should be positively related with CP, while Conscientiousness (C) and Agreeableness (A) should be negatively related to CP. There should be no significant relationship between Extroversion (E) or Neuroticism (N) and CP.

1.4.4. Hypothesis 4—Personality and Technical Skills (TS)

The Technical Skills (TS) factor is an important part of the Digital Citizenship scale as a whole, since it measures participants' perceived self-efficacy in internet-based activities. It does not appear in any of the previous studies except as Internet Use in Russo and Amnå [22]. Openness (O) and Conscientiousness (C) should be positively related to TS, since achieving self-efficacy in a computer tool requires a willingness to learn new things (Openness) and a disposition to learn and adapt oneself to a tool's algorithms. There should be no significant relationship between the personality traits of E, A, or N with TS.

2. Materials and Methods

2.1. Participants

The survey for this study recruited participants through two methods. First, undergraduate students from three universities were invited to participate: a midsize undergraduate university in Canada (n = 515), a large research university in Slovenia (n = 229), and a midsize university in Australia (n = 347). To expand the participant pool beyond students, additional participants were recruited using the SurveyMonkey Audience (SMA) platform (Canada, n = 302; Slovenia, n = 185; Australia, n = 242). The use of crowdsource populations, such as SMA, has become an accepted research practice across various fields [40,41].

A total of 1,915 responses were collected for analysis, out of which 1,820 were deemed valid. The study focused on three countries: Canada (n = 817), Australia (n = 589), and Slovenia (n = 414). In terms of gender distribution, males accounted for 45.5% of the respondents, while females represented 54.5%. Respondents were categorized into different age groups, namely Gen-Z (18–20 years old), which made up 21% of the sample, Millennial/Gen-Y (21–25 and 26–30 years old), comprising 37.2% of the sample, Gen-X (31–40 and 41–50 years old), representing 25.1% of the sample, and Boomers (51–60 and 61+ years old), making up 16.7% of the sample.

2.2. Measures

This study made use of an online survey that included demographic questions (age, gender, country), the Connolly–Miller revised digital citizenship scale (DCS-R) [14], and the BFI-10. All items were answered using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The DCS–R measures four distinct factors: Internet Political Activism (IPA, 6 items), Networking Agency (NA, 3 items), critical perspective (CP, 7 items), and Technical Skills (TS, 3 items). Personality traits were captured using the BFI-10. This ten-item tool is recognized as an efficient assessment of the OCEAN traits, and has been validated across several languages and cultures [42].

2.3. Statistical Analyses

To test these hypotheses, SmartPLS 4.0 [43] was selected and used in conjunction with Partial Least Squares (PLS) modeling. PLS was selected for several reasons. First, this study has some constructs that are latent variables with many predictor variables [44]. In this context, PLS can handle high-dimensional data, unlike traditional ordinary least squares (OLS) regression techniques that would require collapsing the constructs into single indicators. Second, PLS can test the outer model fit at the same time as running the inner model, thereby performing all necessary goodness of fit statistics [45]. Third, PLS modeling accommodates multiple dependent variables within one model [44]. Given that the revised DCS consists of four constructs, with each one a dependent variable within the model, PLS can measure all of them at once instead of conducting four separate multiple regression analyses. Finally, partial least squares (PLS) modeling is advantageous for analyzing survey data due to its nonparametric assumptions [44].

2.4. Fitness of Outer Model

To ensure an appropriate approach to analyzing the data, a stepwise method for SmartPLS, as recommended by Chua [45], was followed. The first step in a PLS analysis is to establish the fitness of the outer model [45,46] by fulfilling three conditions. Firstly, for multi-indicator constructs, the AVE between a latent variable and its indicators should be greater than 0.50 (see: [47] p. 46). Secondly, the square root of AVE must be larger than the correlations of the latent variable with any other latent variables (see: [48] p. 200). Thirdly, for all variables in the model, in line with the Fornell and Larcker [47] test, the square root of the AVE for each latent variable should exceed the absolute correlations with any other latent variables. The model met all of these conditions, as shown in Table 3. Additionally, the measurement model fit was evaluated, and all reflective indicators loaded on the construct were greater than 0.707, as shown in Table 4, which meets the reliability threshold for multi-indicator variables [48,49]. Multicollinearity was assessed by examining the variance inflation factors (VIFs), which ranged between 1.73 and 2.43, and concluding that it was not an issue, as recommended by Hair, Black, Babin, Anderson and Tatham [50]. Thus, the study's measurement model can be considered sound, thus allowing the inner model to be tested and the hypotheses evaluated.

Table 3. Reliability and validity analysis.

	α	CR	AVE	IPA	NA	CP	TS	O	C	E	A	N
IPA	0.88	0.91	0.62	**0.79**								
NA	0.82	0.89	0.73	0.65	**0.85**							
CP	0.85	0.89	0.53	0.60	0.55	**0.73**						
TS	0.84	0.90	0.75	−0.07	0.07	0.16	**0.87**					
O				0.04	0.07	0.08	0.13	1.00				
C				−0.01	0.01	−0.06	0.12	0.12	1.00			
E				0.01	0.09	−0.03	0.03	0.15	0.17	1.00		
A				−0.07	−0.01	0.02	0.06	0.04	0.18	0.13	1.00	
N				−0.04	−0.03	0.04	−0.03	−0.03	−0.23	−0.29	−0.18	1.00

CR, composite reliability; AVE, average variance extracted; α, Crombach's alpha; bold numbers denote square root of AVE for Fornell and Larcker test (1981) AVE test.

Table 4. Latent variables and indicator loadings.

Variable	# of Items	Indicator Loadings						
		1	2	3	4	5	6	7
IPA	6	0.85	0.82	0.81	0.79	0.76	0.71	
NA	3	0.91	0.88	0.76				
CP	7	0.81	0.81	0.77	0.74	0.72	0.72	0.71
TS	3	0.88	0.87	0.86				

3. Results

The regression analyses were conducted using SmartPLS 4.0 (V 4.0.9.5), and the results are presented in Table 5. Additionally, a visualization of the results is provided in Figure 1. In this study, a PLS model was employed to simultaneously calculate all four dependent variables. Control variables, namely gender, age, and nationality, were included in the model for each dependent variable. Although the specific effects of age and gender were not hypothesized in this paper, their importance and their relationship with digital citizenship were examined in a previous study [14]. To account for the potential effects of nationality, Slovenia and Australia were compared to Canada as reference categories. This approach was considered adequate for capturing their effects as control variables. Table 6 provides a summary of the hypothesized results from the analysis while also replicating the hypothesized relationships as displayed in Table 2.

Table 5. PLS Inner Model Results.

	Dependent Variables							
	IPA		NA		CP		TS	
	β	SE	β	SE	β	SE	β	SE
Control Variables								
Gender	−0.10	0.05	−0.01	0.05	0.04	0.05	0.01	0.05
Age	0.17 ***	0.03	0.13 ***	0.03	−0.03	0.03	−0.18 ***	0.03
Slovenia	−0.13 *	0.06	−0.34 ***	0.06	−0.45 ***	0.06	−0.19 ***	0.07
Australia	0.40 ***	0.06	0.15 **	0.06	0.23 ***	0.06	0.00 ***	0.06
Independent Variables								
O	0.03	0.03	0.05	0.03	0.07 ***	0.03	0.13 ***	0.03
C	−0.07 **	0.03	−0.06 *	0.03	−0.10 ***	0.03	0.14 ***	0.03
E	0.07 **	0.03	0.15 ***	0.03	0.02	0.03	−0.03	0.02
A	−0.08 **	0.02	−0.03	0.03	0.02	0.03	0.02	0.03
N	−0.01	0.03	0.02	0.03	0.01	0.03	−0.04	0.03 †
R^2 (adjusted)	11.1%		7.2%		7.0%		6.1%	
ΔR^2 (from control)	4.7% ***		2.3% ***		1.9% ***		4.4% ***	

Dummy variables for country (Slovenia and Australia) are compared to Canada. Notes: Standardized regression coefficients are reported $n = 1820$. † $p < 0.1$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$.
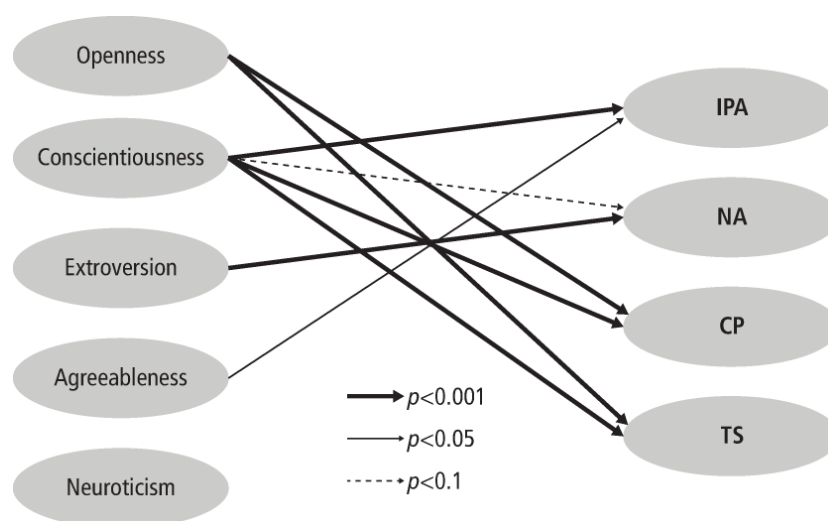

Figure 1. Relationships between personality traits and digital citizenship.

Table 6. Relationships between digital citizenship factors and personality traits *.

	O^hypothesis	O^actual	C^hyp	C^act	E^hyp	E^act	A^hyp	A^act	N
Internet Political Activism (IPA)	+		+	−	+	+	−	−	
Network Agency (NA)				−	+	+	−		
Critical Perspectives (CP)	+	+	−	−			−		
Technical Skills (TS)	+	+	+	+					

* Cell entries indicate the sign on each regression coefficient in which relationships were found to be significant at $p < 0.05$.

The first hypothesis predicted the impact of personality on Internet Political Activism (IPA). The association between Openness (O) and IPA is not significant ($\beta = 0.03$; SE = 0.03; $p > 0.1$). The relationship between Conscientiousness (C) and IPA is surprising since it is negative and significant ($\beta = -0.07$; SE = 0.03; $p < 0.01$). However, the relationship between Extraversion (E) and is positive and significant as expected ($\beta = 0.07$; SE = 0.03; $p < 0.01$). Lastly, the relationship between Agreeableness (A) and IPA is negative and significant, as anticipated ($\beta = -0.08$; SE = 0.03; $p < 0.01$).

The second hypothesis predicted the influence of personality on Network Agency (NA). The relationship between Extraversion (E) and is positive and significant as expected ($\beta = 0.15$; SE = 0.03; $p < 0.001$). However, Agreeableness (A) is not significant ($\beta = -0.03$; SE = 0.03; $p > 0.1$). Although no other relationships with NA were predicted, Conscientiousness (C) was found to be significantly and negatively associated with NA.

The third hypothesis examined the association between personality and Critical Perspectives (CP). As predicted, Openness (O) is positively and significantly related to CP ($\beta = 0.07$; SE = 0.03; $p < 0.001$). Moreover, as expected, Conscientiousness (C) is negatively and significantly associated with CP ($\beta = -0.10$; SE = 0.03; $p < 0.001$). However, Agreeableness (A) was found to be not significantly related to CP.

The fourth hypothesis explored the link between personality and Technical Skills (TS). As predicted, both Openness (O) ($\beta = -0.13$; SE = 0.03; $p < 0.001$) and Conscientiousness (C) ($\beta = -0.14$; SE = 0.03; $p < 0.001$) are positively associated with TS.

In summary, while there were significant associations between personality traits and the four dimensions of digital citizenship, they did not match all of the hypothesized expectations. By analyzing all the relationships in a single model, a more comprehensive understanding of the complex interactions between these constructs was obtained in comparison to examining them in isolation. While the inclusion of personality traits in the model significantly improved the variance explained for all dependent variables, as evidenced by the R^2 and change in R^2 in Table 5, the effect sizes were only moderate.

4. Discussion

The validity of the DCS-R is supported by the partial concordance between these research results and findings from other recent personality studies, as shown in Table 6. However, it is important to note that the DCS-R measures digital citizenship specifically, which is different from previous studies that focused more on traditional mechanisms for experiencing and expressing citizenship. Several important distinctions were found when investigating the intersection between the Big Five personality traits and the four constructs measured by the DCS-R. The details of these differences are outlined in detail below.

4.1. Personality and Internet Political Activism (IPA)

The IPA factor in the DCS is similar to the more traditional measures of political participation captured in the studies presented in Table 2. Therefore, our hypotheses that Openness (O), Conscientiousness (C), and Extraversion (E) would be positively related to IPA, while Agreeableness (A) would be negatively related, were based on these earlier studies. It is not surprising that individuals who score high on the Openness metric would be inclined to explore novel technological experiences and therefore be more likely to

participate in digital citizenship activities. However, our results did not show a significant relationship between O and IPA, which is unexpected and will require further investigation.

There are several possible explanations as to why the relationship between Openness and Internet Political Activism (IPA) is nonsignificant. First, regional and political contexts could mediate this relationship, as found by Roets, Cornelis, and Van Hiel [51]. For instance, Openness was associated with activism for those with a left-wing orientation in Western Europe, but only for those with a right-wing orientation in Eastern Europe. This suggests that the relationship between Openness and political activism is not universal but context-dependent. Given that our cross-national panel contained respondents from both Eastern Europe and English-speaking countries similar to Western Europe's political culture, it is not surprising that the relationship was nonsignificant.

Another possible explanation is that, as the internet and social media became more ubiquitous and less novel, this relationship between Openness and engagement in digital citizenship may not always hold true [52]. Furthermore, online participation, such as signing a petition, participating in discussion forums, or writing emails to government officials, may not provide the depth of experience attractive to those high in the Openness trait. In addition, the online record of one's participation may be a deterrent to those who want to keep their options for experience open. In contrast, those high in Openness may be drawn towards public advocacy, demonstrations, or other forms of protest, as they are often rich, novel, and anonymous experiences.

The positive relationship between Conscientiousness and traditional forms of political activity is not surprising, as these activities are often considered a duty of citizenship [4]. However, the seven items in the DCS-R that measure IPA focus less on citizenship duties and more on the engagement of individuals in online activities with a political flavor. This may explain why the expected positive relationship between Conscientiousness and IPA was not found, and in fact, a negative relationship was found instead. Notably, the only study in Table 1 that examined the relationship between internet usage and personality (Russo and Amnå [22]) also found a negative correlation between Conscientiousness, social media, and internet use.

There are likely a variety of possible explanations for the negative relationship between Conscientiousness and engagement in digital citizenship activities. One is that individuals high in Conscientiousness value order and structure, whereas the online realm is still evolving and may appear unstructured to some individuals. Additionally, individuals high in Conscientiousness may feel obligated to speak up on social justice issues and engage in online problem-solving activities or political volunteering. However, as suggested by Brandstätter and Opp [53], they may also be more inclined to comply with established societal norms and rules, which could discourage them from engaging in unconventional forms of online activism, such as organizing or signing online petitions or contacting government officials online.

Finally, since the relationship between IPA and both Extraversion and Agreeableness followed the expectation of our hypotheses (as established by the existing literature), there is no need for additional commentary about these findings.

4.2. Personality and Network Agency (NA)

The Network Agency (NA) factor measures the extent to which individuals actively contribute to online social and political content instead of passively consuming it. Previous studies have found that Agreeableness is negatively correlated with political activity due to its association with conflict avoidance and a tendency to perceive low political efficacy [22,35–38]. Hypothesis 2 expressed a similar expectation for online network agencies, but as shown in Table 6, no significant relationship between Agreeableness (A) and NA was found. One possible explanation for this result is that individuals who score high on Agreeableness may demonstrate empathy and cooperation by sharing and commenting on others' posts rather than engaging in more combative forms of online political engagement. Another possible explanation for the nonsignificant result could be the different

nature of online interactions compared to traditional political activities. On the one hand, online interactions often involve a greater degree of anonymity, which may allow individuals to express themselves more freely and confidently than they would in face-to-face interactions. On the other hand, online networking may require less assertiveness as the perceived degree of conflict may be lower online compared with offline interactions. The nuanced complexity of online environments may explain the reduced association between Agreeableness and online political engagement compared to traditional political activities.

4.3. Personality and Critical Perspectives (CP)

The Critical Perspectives (CP) factor is an important aspect of contemporary digital citizenship. Early conceptualizations of digital citizenship tended to reflect the optimism and even utopianism of the early years of the web [9]. In an era of digitally supplied mass misinformation, the inclusion of criticality in the measurement of digital citizenship is arguably a key strength of the DCS/DCS-R. Hypothesis 3 predicted that Openness would have a positive association and Conscientiousness would have a negative association with CP, which the results supported. However, the predicted negative relationship between Agreeableness and CP did not materialize in the findings.

The lack of a significant association between Agreeableness and Critical Perspectives (CP) is surprising given that individuals high in Agreeableness tend to avoid conflict and align with conservative political views [20,31,54]. This result suggests that being critical of digital environments may no longer rely solely on personality or political leanings. Instead, it may be a generalized attitude that most internet users have incorporated into the way that they think about online environments. This perhaps also reflects the intentional efforts being made by educators to incorporate critical digital literacy throughout the K-16 curriculum [17,18].

4.4. Limitations

As with any self-reporting questionnaire, results are influenced by bias and limited by the degree to which individuals are aware of their actual behaviors or traits. Given that this study used a brief measure of the big five factors, perhaps the full version (BFI-44) would serve to illuminate other connections between personality traits and online citizenship behaviors. Further studies in this field could also incorporate socioeconomic factors or political party preferences.

The DCS-R showed consistency across the three countries studied, but there were significant differences in IPA and CP scores among these populations. Table 5 shows that nationality is a more significant factor in explaining the variance in IPA, NA, and CP scores (e.g., a beta of -0.45 for Slovenia's CP score) than any of the personality traits. Therefore, caution is needed when generalizing these findings to other countries. To address this limitation, future research could expand the study to include more countries, which would allow for a hierarchical structure to analyze the data.

Capturing digital citizenship behaviors using an online survey can introduce biases, particularly for the NA and TS factor scores. To address the issue of common method bias, it is important to use multiple measures when collecting data for studies. While personality is generally considered a stable trait, the use of subjective measures for both independent and dependent variables can introduce potential biases into the study. One way to mitigate this is to compare the results of the DCS-R with less subjective measures, such as socioeconomic factors. Including measures of socioeconomic factors would provide additional context to the study results and help control for potential confounding variables. For example, individuals from lower socioeconomic backgrounds may have limited access to digital technologies or may be less likely to engage in digital citizenship behaviors. By including these factors in the analysis, researchers could gain a better understanding of the relationships between personality, digital citizenship behaviors, and socioeconomic factors.

Lastly, it is also important to consider the timing of data collection. The survey data used in this study were collected in late 2018, before the COVID-19 pandemic drastically

changed the way people interacted online. Investigating digital citizenship behaviors in the post-pandemic world could provide valuable insights into how the pandemic has affected digital behaviors and attitudes.

4.5. Future Research

With respect to the measurement of digital citizenship, expanding the DCS-R to capture political attitudes, participation activities, and other aspects of online civic behaviors would be a useful next step. Investigating how digital citizenship behaviors are expressed in the post-pandemic world would also make a valuable contribution, given that remote work and online social activities have now become more mainstream. Going forward, it would be beneficial to combine the four dimensions of digital citizenship into one higher-order construct to examine how personality and other factors affect digital citizenship as a coherent construct rather than considering each dimension in isolation. This approach can provide several advantages for researchers, such as capturing the complexity and interrelatedness of the different dimensions of digital citizenship and reducing the risk of spurious or conflicting findings. Furthermore, a coherent construct can enable a more nuanced understanding of how different factors interact with digital citizenship, such as the potential moderating effect of personality traits on the relationship between digital citizenship and outcomes such as flourishing. An expanded DCS-R instrument, combined into one higher-order construct, could offer a more robust and integrated approach to research in this field.

5. Conclusions

Results of this study indicate that citizenship behaviors in the online world have unique relationships with the big five personality traits compared to citizenship activities in traditional offline environments. These personality traits are understood to be dispositional features that drive how individuals interact with the external world, not individual characteristics shaped by the outside world. As the digital environment becomes the dominant format for political discourse, understanding how different personality traits affect engagement can be valuable. Identifying the personality traits associated with different aspects of digital citizenship leads to a better understanding of the motivations, behaviors, and attitudes of individuals in these online spaces. This knowledge can inform policy decisions, guide the development of digital literacy programs, and help educators and other professionals better support individuals in their online activities.

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