

Citizenship in the digital realm and the prominent characteristics of personality known as the Big Five Traits

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ABSTRACT

In the last two decades, the internet has evolved into a vital platform for political expression, community development, and social activism. Scholars across diverse fields have endeavored to comprehend and assess the impact of these changes on individuals' civic attitudes and behaviors. The Digital Citizenship Scale, in both its original and revised forms, has become a widely employed tool for evaluating these transformations. However, there has been a significant gap in research exploring the relationship between digital citizenship behaviors and external variables. This study addresses this gap by employing the classic Big Five Factor model of personality (Openness to experience, Conscientiousness, Extroversion, Agreeableness, and Neuroticism) to examine how personality traits correspond with key aspects of digital citizenship. Survey data collected from three countries (n = 1820) revealed that personality traits exhibit unique associations with digital citizenship compared to conventional forms of civic engagement. The implications of these findings are further discussed.

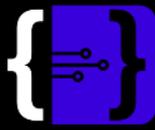
Keywords: *online citizenship; assessment; personality characteristics; OCEAN; internet activism*



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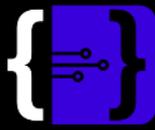


Ciudadanía en el ámbito digital y las características destacadas de la personalidad conocidas como los Rasgos del Big Five

RESUMEN

En las últimas dos décadas, internet ha evolucionado hasta convertirse en una plataforma vital para la expresión política, el desarrollo comunitario y el activismo social. Académicos de diversos campos se han esforzado por comprender y evaluar el impacto de estos cambios en las actitudes y comportamientos cívicos de las personas. La Escala de Ciudadanía Digital, tanto en su forma original como revisada, se ha convertido en una herramienta ampliamente utilizada para evaluar estas transformaciones. Sin embargo, ha existido una brecha significativa en la investigación que explora la relación entre los comportamientos de ciudadanía digital y variables externas. Este estudio aborda esta brecha utilizando el clásico modelo de los Cinco Grandes Factores de personalidad (Apertura a la experiencia, Responsabilidad, Extroversión, Amabilidad y Neuroticismo) para examinar cómo los rasgos de personalidad se corresponden con aspectos clave de la ciudadanía digital. Los resultados de la encuesta recopilados en tres países ($n = 1820$) revelaron que los rasgos de personalidad muestran asociaciones únicas con la ciudadanía digital en comparación con formas convencionales de participación cívica. Las implicaciones de estos hallazgos se discuten más a fondo.

Palabras clave: *ciudadanía en línea; evaluación; características de personalidad; OCEAN; activismo en internet*



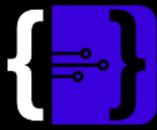
INTRODUCTION

Over the last two decades, the internet has become an essential platform for political expression, community building, and social activism, experiencing a notable increase in its significance. During this period, traditional approaches to civic engagement have seen a decline in participation rates [1–3]. Consequently, scholars across various disciplines have sought to comprehend the implications of these changes for political and social life and explore methods to measure these transformed behaviors. One concept that has proven particularly valuable in this context is digital citizenship.

Citizenship, a concept deeply rooted in history dating back to Plato and Aristotle, has generally been understood as a shared set of expectations regarding how members of a society engage in the political realm [4]. However, in the last two decades, the emergence of digital citizenship as a novel research concept has brought a fresh perspective to the study of citizenship, notably capturing the attention of scholars in education and media studies [5].

Digital citizenship has primarily been linked to teaching and evaluating computer literacy, responsible online behavior, and appropriate technology usage within K-12 settings [6,7]. While this approach remains the most prevalent interpretation of digital citizenship, scholars like Emejulu and McGregor [9] argue that its emphasis on tool literacy lacks in providing a critical understanding of individuals' social relationships with technology and the digital realm. They assert that it conceals and suppresses the underlying politics inherent in the concept of citizenship. Similarly, Heath highlights that the focus on skills and responsibility limits its potential to fulfill the fundamental purpose of public schooling in a democratic society: nurturing active citizens [10].

A crucial advancement involves conceptualizing digital citizenship to enable researchers to assess individuals' political engagement within their communities through online platforms. As mentioned earlier, numerous scholars contend that there has been an expansion in the modes of political participation over the past two decades. While traditional citizenship activities such as voting and political party volunteering are declining, newer forms of engagement like product boycotts, protests, and community volunteering are gaining popularity, especially among the younger generation. Additionally, digitally networked participation activities, including sharing political content online or



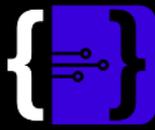
signing online petitions, have emerged as a contemporary mode of political involvement potentially replacing traditional forms of participation [11,12].

A significant contribution to digital citizenship research was made by Choi, Glassman, and Cristol [13] with their 26-item Digital Citizenship Scale (DCS). This scale notably pioneered the explicit measurement of criticality, political engagement, and activism within online environments. Building upon this, Connolly and Miller [14] further advanced the instrument in Informatics, resulting in the development of a revised 19-item scale (DCS-R) with four distinct factors. While at least seven other studies have measured digital citizenship using the DCS or DCS-R (refer to the literature review in Fernández-Prados, Lozano-Díaz, and Ainz-Galende [15]), none have investigated how external factors impact digital citizenship measures. This study contributes to the emerging DCS/DCS-R literature by examining, for the first time, the relationship between personality traits and digital citizenship behaviors using survey data (n = 1820) that includes both students and the general public from three different countries.

Revised Digital Citizenship Scale

The Digital Citizenship Scale (DCS) developed by Choi, Glassman, and Cristol [13] introduced a survey tool to assess the abilities, perceptions, and levels of political participation in individuals' online activities. The 26-item questionnaire comprises 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). Participants from a midwestern American university were involved, and a subsequent study by Choi, Cristol, and Gimbert [16] extended the survey to teachers in the United States.

Connolly and Miller [14] condensed the DCS into a 19-item scale to ensure validity across generations and nationalities. The resulting Revised Digital Citizenship Scale (DCS-R) includes 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 comprehensive item list, refer to Connolly and Miller [14].

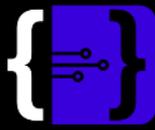


The Internet Political Activism factor captures the diverse ways individuals experience active political life online, such as signing online petitions, contacting government officials through online methods, or participating in online groups focused on political or social issues. The Networking Agency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

Personality Traits and Their Measurement

Research on trait-based personality is based on several assumptions, including the existence and measurability of traits, their variability across individuals, their influence on behavior and opinion formation, and the reflection of these traits in language used to describe personality differences [19,20]. Lexical and factor analyses have identified five cross-cultural traits known as the Big Five Factor Model, or commonly referred to as OCEAN: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism [21].

Openness signifies the extent to which an individual's cognitive processes embrace diverse experiences. Individuals with high openness levels are intellectually curious, open-minded, and actively seek new ideas and novel experiences. Conscientiousness relates to an individual's ability to exercise self-control, follow social norms, and act in a goal-directed manner, displaying qualities such as planning, organization, and adherence to rules and responsibilities. Extraversion reflects a preference for social interaction, an outward-oriented approach to life, and a tendency to seek positive emotional experiences through social engagement. Agreeableness represents a tendency to avoid conflict and a strong desire to be liked by others, often associated with prosocial, communal, and cooperative behaviors. Neuroticism, or its inverse, Emotional Stability, encompasses measures of temperament, nervousness, and susceptibility to negative emotions [22]. Individuals with low scores in the Neuroticism trait are less prone to stress and are generally considered emotionally stable.

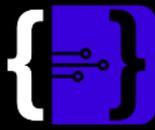


According to Gerber, Huber, Doherty, and Dowling [20], the five personality traits "possess predictive power across a diverse array of domains but are not universally indicative of all outcomes" (p. 268). Various survey tools gauge these traits, ranging from concise measures like the Ten-Item Personality Measure [23] and the 15-item BFI-2-XS [24] to more extensive instruments such as the 60-item BFI-2 and the 300-item IPEP-NEO [20]. Although the comprehensive tools offer enhanced internal reliability, they can be impractical in surveys where other factors like political views, technological usage, or purchasing behaviors are under examination. Consequently, briefer instruments are commonly employed in these situations, even though it's worth noting that in some contexts, these condensed measures may yield smaller effect sizes compared to longer instruments [25]. Regardless, these instruments find application across various domains, including within the field of computing itself (refer to [26–30]).

Personality and Citizenship

Numerous studies have explored the connection between personality traits and political preferences or voting intentions [31]. However, there have been fewer studies that have taken a broader perspective, examining a range of civic behaviors and attitudes collectively referred to as citizenship. While the concept of citizenship can vary from nation to nation [32], commonalities exist, such as participation in civic activities, knowledge about government, commitment to order, and respect for 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), and these variations extend across countries [33]. The existing literature delves into how personality influences political opinions with some breadth, but studies investigating how personality impacts behavior and efficacy, especially in online environments, are limited [34].

Concerning digital citizenship, the trait of Openness may shape the inclination to explore and adopt new digital technologies, engage in diverse online communities, and embrace innovative approaches to online collaboration. Conscientiousness may be evident in responsible online behavior, adherence to ethical guidelines, and effective management of one's digital presence. Extraversion may influence digital citizenship through active participation in online communities, initiating and maintaining online



relationships, and using social media platforms for networking and communication. The Agreeableness trait may exhibit a negative correlation with political activity due to a preference for conflict avoidance and a tendency toward low political efficacy [33], while higher levels of Neuroticism may be linked to negative online behaviors and experiences such as cyberbullying and social media-induced anxiety.

Table 1 provides a summary of research discoveries regarding the relationship between OCEAN traits and citizenship.

Study	O	C	E	A	N
Mondak, Hibbing, Canache, Seligson and Anderson [19] USA, Urug, Venez, 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	-	+	+	+	-

*Entries within cells indicate the direction of each regression coefficient where significant relationships were identified at $p < 0.05$.

The Present Investigation and Its Hypotheses

In an evolving landscape, digital realms are supplanting conventional spaces for active participation in political endeavors and civic involvement. Examining how distinct personality traits correlate with various facets of digital citizenship holds the potential to enhance our comprehension of individuals' intentions, motivations, and conduct in these online spheres. In pursuit of this objective, an analysis of data obtained from adults in three different countries was undertaken to scrutinize the association between the Five-Factor Model of personality and digital citizenship, as gauged by the DCS-R. The following hypotheses were initially posited by the authors, succinctly outlined in Table 2 and elaborated upon in subsequent sections.

Table 2. Envisaged associations 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)	+	+			

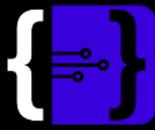
*Entries within cells denote the anticipated direction of each regression coefficient where significant relationships are expected at $p < 0.05$.

Hypothesis 1-Personality and Internet Political Activity (IPA): Building on preceding research outlined in Table 1, it is predicted that the personality traits of Openness (O), Conscientiousness (C), and Extraversion (E) will exhibit a positive correlation with Internet Political Activism (IPA), while Agreeableness (A) will display a negative association with IPA. No significant relationship is expected between Neuroticism (N) and IPA.

Hypothesis 2-Personality and Network Agency (NA): Extraversion (E) is anticipated to demonstrate a positive relationship with Network Agency (NA), whereas Agreeableness is expected to exhibit a negative correlation with NA. Other personality traits are not anticipated to show a significant relationship with the NA factor.

Hypothesis 3-Personality and Critical Perspectives (CP): Given that Critical Perspectives (CP) measures an individual's willingness to critically assess society and the internet, Openness (O) is hypothesized to be positively correlated with CP. Conversely, Conscientiousness (C) and Agreeableness (A) are expected to show a negative association with CP. No significant relationship is predicted between Extraversion (E) or Neuroticism (N) and CP.

Hypothesis 4-Personality and Technical Skills (TS): As an integral part of the Digital Citizenship scale, the Technical Skills (TS) factor gauges participants' perceived self-efficacy in internet-based activities. Openness (O) and Conscientiousness (C) are anticipated to exhibit a positive correlation with TS, as achieving self-efficacy in a computer tool requires a willingness to learn new things (Openness) and a disposition to adapt oneself to a tool's algorithms (Conscientiousness). No significant relationship is expected between the personality traits of E, A, or N and TS.



MATERIALS AND METHODS

Participants

The survey enlisted participants through two methods. Initially, undergraduate students from three universities were invited to participate, including 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 diversify the participant pool, additional participants were recruited through the SurveyMonkey Audience (SMA) platform (Canada, $n = 302$; Slovenia, $n = 185$; Australia, $n = 242$). Utilizing crowdsource populations like SMA has become an accepted research practice across various fields [40,41]. A total of 1,915 responses were collected, with 1,820 considered valid. The study focused on three countries: Canada ($n = 817$), Australia ($n = 589$), and Slovenia ($n = 414$). Regarding gender distribution, males comprised 45.5% of respondents, while females constituted 54.5%. Respondents were categorized into different age groups: Gen-Z (18–20 years old) made up 21% of the sample, Millennial/Gen-Y (21–25 and 26–30 years old) constituted 37.2%, Gen-X (31–40 and 41–50 years old) represented 25.1%, and Boomers (51–60 and 61+ years old) accounted for 16.7%.

Measures

In this investigation, an online survey was utilized, encompassing demographic inquiries (age, gender, country), the Connolly–Miller revised digital citizenship scale (DCS-R) [14], and the BFI-10. Respondents provided responses on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The DCS-R gauges 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 evaluated using the BFI-10, a recognized and efficient tool for assessing the OCEAN traits, validated across various languages and cultures [42].

Statistical Analyses

To scrutinize the outlined hypotheses, SmartPLS 4.0 [43] was chosen, employing Partial Least Squares (PLS) modeling. PLS was chosen due to its suitability for latent variables with numerous predictor variables, its ability to handle high-dimensional data, and its accommodation of multiple dependent variables within one model. This was especially advantageous for this study with four constructs in the

revised DCS. PLS allows simultaneous measurement of all constructs, avoiding the need for separate regression analyses. Moreover, PLS is nonparametric, aligning well with the characteristics of survey data.

Fitness of Outer Model

To ensure the appropriate treatment of the data, a stepwise approach for SmartPLS was adhered to, following Chua's recommendations [45]. The initial step involved verifying the outer model fit through three conditions. Firstly, the AVE between a latent variable and its indicators should surpass 0.50 for multi-indicator constructs. Secondly, the square root of AVE must exceed the correlations of the latent variable with other latent variables. Thirdly, the square root of the AVE for each latent variable should exceed the absolute correlations with other latent variables, according to the Fornell and Larcker test [47]. The model met all these conditions, as indicated in Table 3. Additionally, the measurement model fit was assessed, with all reflective indicators loading on the construct exceeding 0.707, meeting the reliability threshold for multi-indicator variables [48,49]. Multicollinearity was examined through variance inflation factors (VIFs), ranging between 1.73 and 2.43, confirming its absence, as advised by Hair et al. [50]. Consequently, the study's measurement model is deemed robust, allowing the testing of the inner model and hypothesis evaluation.

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 , Cronbach'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				

RESULTS

The analysis utilized SmartPLS 4.0 (V 4.0.9.5) for conducting regression analyses, and the outcomes are outlined in Table 5. Figure 1 visually represents the results. In this investigation, a PLS model was employed to concurrently compute all four dependent variables. Control variables, including gender, age, and nationality, were incorporated into the model for each dependent variable. While the specific impacts of age and gender were not hypothesized in this paper, their significance and their correlation with digital citizenship were explored in a preceding study [14]. To address the potential influences of nationality, Slovenia and Australia were compared to Canada as reference categories. This approach was deemed appropriate for capturing their effects as control variables. Table 6 succinctly summarizes the anticipated results from the analysis, replicating the hypothesized relationships outlined 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 $n = 1820$. † $p < 0.1$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$.

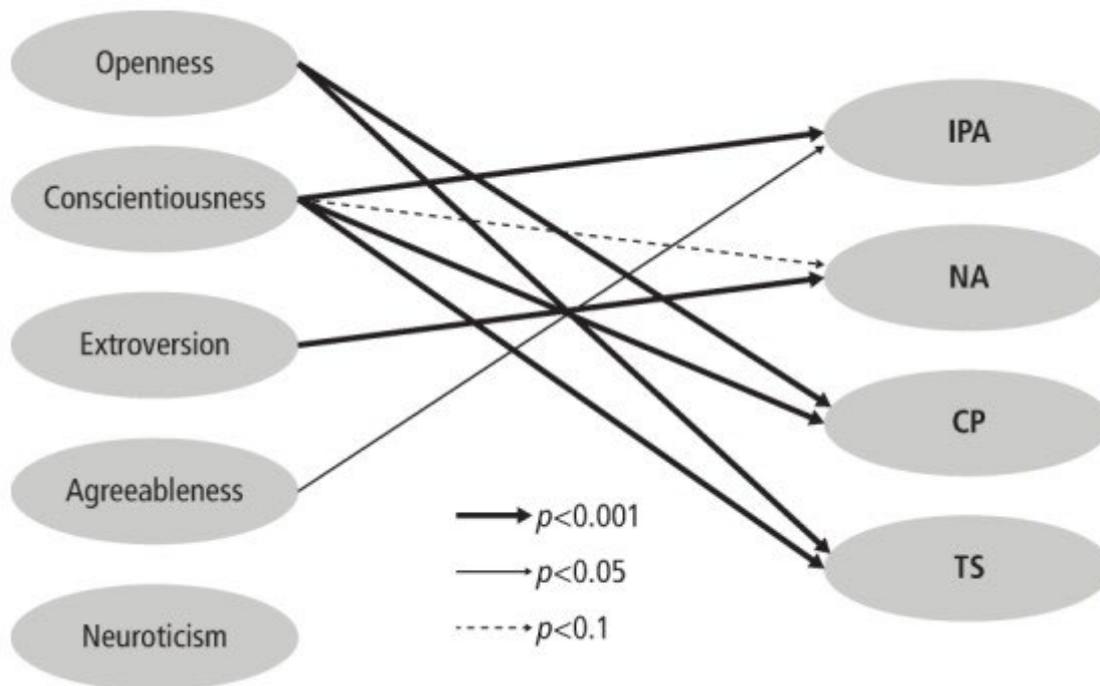


Figure 1. Relationships between personality traits and digital citizenship

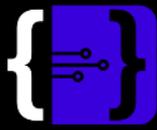
Table 6. Relationships between digital citizenship factors and personality traits *

	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 initial hypothesis aimed to predict the influence of personality on Internet Political Activism (IPA). The connection between Openness (O) and IPA was found to be statistically insignificant ($\beta = 0.03$; $SE = 0.03$; $p > 0.1$). An unexpected outcome emerged in the relationship between Conscientiousness (C) and IPA, which was negative and significant ($\beta = -0.07$; $SE = 0.03$; $p < 0.01$). Conversely, the anticipated positive and significant association between Extraversion (E) and IPA was confirmed ($\beta = 0.07$; $SE = 0.03$; $p < 0.01$). Lastly, the predicted negative and significant relationship between Agreeableness (A) and IPA was validated ($\beta = -0.08$; $SE = 0.03$; $p < 0.01$).

The second hypothesis focused on forecasting the impact of personality on Network Agency (NA). The expected positive and significant relationship between Extraversion (E) and NA was confirmed ($\beta = 0.15$; $SE = 0.03$; $p < 0.001$), while Agreeableness (A) was deemed statistically insignificant ($\beta = -0.03$;



SE = 0.03; $p > 0.1$). Although no other relationships with NA were initially predicted, an unforeseen negative association was found between Conscientiousness (C) and NA.

The third hypothesis delved into examining the correlation between personality and Critical Perspectives (CP). As anticipated, Openness (O) exhibited a positive and significant relationship with CP ($\beta = 0.07$; SE = 0.03; $p < 0.001$). Correspondingly, Conscientiousness (C) displayed a negative and significant association with CP ($\beta = -0.10$; SE = 0.03; $p < 0.001$). However, Agreeableness (A) was identified as not significantly related to CP.

The fourth hypothesis explored the connection between personality and Technical Skills (TS). Both Openness (O) ($\beta = -0.13$; SE = 0.03; $p < 0.001$) and Conscientiousness (C) ($\beta = -0.14$; SE = 0.03; $p < 0.001$) were positively associated with TS, aligning with the anticipated outcomes.

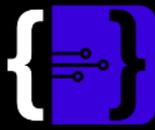
In summary, while notable associations were observed between personality traits and the four dimensions of digital citizenship, not all aligned with the initially hypothesized expectations. The comprehensive examination of these relationships in a unified model provided a more nuanced understanding of the intricate interactions between these constructs compared to isolated analyses. Although the inclusion of personality traits significantly enhanced the variance explained for all dependent variables, as indicated by the R² and change in R² in Table 5, the effect sizes remained moderate.

DISCUSSION

The credibility of the DCS-R is reinforced by the partial alignment of these research findings with recent personality studies, as depicted in Table 6. It's crucial to emphasize that the DCS-R specifically gauges digital citizenship, distinguishing it from prior studies that concentrated more on conventional avenues for encountering and expressing citizenship. A thorough examination of the interplay between the Big Five personality traits and the four constructs gauged by the DCS-R revealed several significant distinctions, elaborated below.

Personality and Internet Political Activism (IPA)

The IPA factor in the DCS mirrors traditional measures of political participation outlined in Table 2. Our expectations, derived from previous studies, proposed positive associations between Openness (O),

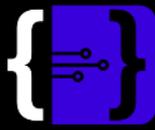


Conscientiousness (C), and Extraversion (E) with IPA, while suggesting a negative association with Agreeableness (A). These anticipations were grounded in the patterns observed in earlier research. Notably, our results did not confirm a significant link between Openness and IPA, presenting an unexpected outcome warranting further exploration.

Various factors could contribute to the nonsignificant relationship between Openness and Internet Political Activism (IPA). One potential influence is the mediation of regional and political contexts, as evidenced by Roets, Cornelis, and Van Hiel [51]. The association between Openness and activism, for instance, was contingent on left-wing orientation in Western Europe and right-wing orientation in Eastern Europe. This contextual dependence implies that the relationship between Openness and political activism is nuanced and not universally applicable. Given our diverse cross-national panel with respondents from both Eastern Europe and English-speaking countries akin to Western Europe's political culture, the lack of significance is not entirely surprising.

Another plausible explanation considers the evolving landscape of the internet and social media. As these platforms became more pervasive and less novel, the assumed link between Openness and engagement in digital citizenship might not hold universally true [52]. Additionally, certain online participatory activities, like signing petitions or engaging in discussion forums, may not offer the depth of experience appealing to individuals high in the Openness trait. Moreover, concerns about online visibility might deter those seeking diverse experiences from active online participation. Conversely, individuals with high Openness might be drawn to more public forms of advocacy, demonstrations, or other expressive methods, which often provide rich, novel, and relatively anonymous experiences. Further investigation into these dynamics is warranted to unravel the complexities of the relationship between Openness and Internet Political Activism.

The affirmative association between Conscientiousness and conventional political engagement, rooted in the perception of these activities as civic duties [4], is unsurprising. However, the specific focus of the seven DCS-R items gauging Internet Political Activism (IPA) extends beyond traditional citizenship duties, centering more on individuals participating in online activities with political dimensions. This shift in emphasis may elucidate the absence of the anticipated positive correlation between



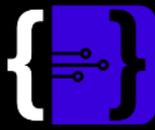
Conscientiousness and IPA, revealing, unexpectedly, a negative relationship. Noteworthy is the sole study in Table 1 delving into the correlation between internet usage and personality (Russo and Amnå [22]), which similarly reported a negative correlation involving Conscientiousness, social media, and internet use.

Several plausible explanations may account for the adverse correlation between Conscientiousness and involvement in digital citizenship pursuits. Firstly, individuals with high Conscientiousness may highly value order and structure, perceiving the evolving online realm as lacking structure. Additionally, these individuals may feel compelled to voice their opinions on social justice issues and engage in online problem-solving or political volunteering. Yet, as Brandstätter and Opp [53] suggest, their inclination to adhere to established societal norms and rules may dissuade them from participating in unconventional forms of online activism, such as organizing or endorsing online petitions or reaching out to government officials online.

Since the observed relationship between IPA and both Extraversion and Agreeableness aligns with our hypotheses, as supported by existing literature, no further commentary is necessary on these findings.

Personality and Network Agency (NA)

The Network Agency (NA) factor gauges individuals' active contributions to online social and political content, distinguishing between active contribution and passive consumption. Past studies have indicated a negative correlation between Agreeableness and political engagement due to its connection with conflict avoidance and a tendency to perceive low political efficacy [22,35–38]. Hypothesis 2 posited a similar expectation for online network agencies. However, as indicated in Table 6, no significant relationship between Agreeableness (A) and NA was identified. One plausible explanation for this outcome is that individuals scoring high in Agreeableness might express empathy and cooperation by sharing and commenting on others' posts, rather than engaging in more confrontational forms of online political participation. Another possible explanation for the non-significant result could stem from the distinct nature of online interactions compared to traditional political activities. Online interactions often afford a greater degree of anonymity, enabling individuals to express themselves more openly and confidently than in face-to-face interactions. Conversely, online networking may necessitate



less assertiveness, as the perceived level of conflict may be lower online than in offline interactions. The nuanced complexity of online environments may elucidate the diminished association between Agreeableness and online political engagement compared to traditional political activities.

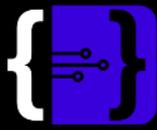
Personality and Critical Perspectives (CP)

The Critical Perspectives (CP) component holds significance in the landscape of contemporary digital citizenship, serving as a pivotal aspect. Early conceptualizations of digital citizenship often mirrored the optimism and utopian ideals prevalent in the initial stages of the web's development [9]. In the present era, characterized by digitally disseminated misinformation on a massive scale, the incorporation of critical thinking into the assessment of digital citizenship stands out as a crucial strength of the DCS/DCS-R. Hypothesis 3 posited that Openness would exhibit a positive correlation, while Conscientiousness would display a negative correlation with CP—a prediction validated by the results. However, the expected negative relationship between Agreeableness and CP did not materialize, defying the anticipated outcome.

The absence of a significant association between Agreeableness and Critical Perspectives (CP) is unexpected, given that individuals with high Agreeableness levels typically steer clear of conflict and tend to align with conservative political perspectives [20,31,54]. This outcome suggests that the act of being critical toward digital environments may no longer hinge solely on personality traits or political inclinations. Instead, it might signify a pervasive attitude that the majority of internet users have incorporated into their overall thinking about online spaces. This trend may also reflect intentional efforts by educators to integrate critical digital literacy comprehensively into the K-16 curriculum [17,18].

Limitations

Like any self-reporting questionnaire, the results are susceptible to bias and constrained by individuals' awareness of their actual behaviors or traits. The utilization of a brief measure of the big five factors in this study prompts consideration of whether the full version (BFI-44) could unveil additional connections between personality traits and online citizenship behaviors. Future investigations in this domain might also integrate socioeconomic factors or political party preferences.



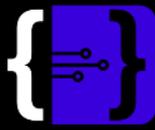
While the DCS-R demonstrated consistency across the three countries under study, significant differences in IPA and CP scores emerged among these populations. Table 5 illustrates that nationality plays a more significant role in elucidating the variance in IPA, NA, and CP scores—e.g., a beta of -0.45 for Slovenia's CP score—than any of the personality traits. Consequently, exercising caution when extending these findings to other countries is essential. To address this limitation, subsequent research endeavors could broaden the study to encompass more countries, facilitating a hierarchical structure for data analysis.

The adoption of an online survey to capture digital citizenship behaviors introduces biases, particularly in the NA and TS factor scores. To counteract common method bias, incorporating multiple measures during data collection becomes imperative. Despite personality traits generally being regarded as stable, the reliance on subjective measures for both independent and dependent variables introduce potential biases. Mitigating this concern involves comparing DCS-R results with less subjective measures, such as socioeconomic factors. The inclusion of socioeconomic measures would offer additional context to the study's outcomes and aid in controlling potential confounding variables. For instance, individuals from lower socioeconomic backgrounds might face limited access to digital technologies or exhibit a lower likelihood of engaging in digital citizenship behaviors. Integrating these factors into the analysis could enhance researchers' understanding of the connections between personality, digital citizenship behaviors, and socioeconomic factors.

Lastly, considering the timing of data collection is paramount. The survey data utilized in this study were gathered in late 2018, preceding the COVID-19 pandemic's transformative impact on online interactions. Investigating digital citizenship behaviors in the post-pandemic era could yield valuable insights into how the pandemic has influenced digital behaviors and attitudes.

Future Research

In the realm of digital citizenship measurement, an advantageous progression would involve expanding the DCS-R to encompass political attitudes, participation activities, and various facets of online civic behaviors. Investigating the expression of digital citizenship behaviors in the post-pandemic landscape holds considerable merit, especially considering the widespread adoption of remote work and increased



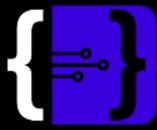
prominence of online social activities. Looking ahead, amalgamating the four dimensions of digital citizenship into a unified higher-order construct stands out as a beneficial approach. This holistic examination would shed light on how personality and other factors collectively influence digital citizenship, moving beyond the examination of each dimension in isolation. This integrated approach offers several advantages for researchers, allowing for a nuanced exploration of the intricate and interconnected nature of different digital citizenship dimensions, thereby minimizing the risk of spurious or conflicting findings. Moreover, a unified construct facilitates a more sophisticated understanding of how diverse factors interact with digital citizenship, including the potential moderating impact of personality traits on the relationship between digital citizenship and outcomes like flourishing. An enhanced DCS-R instrument, consolidated into a higher-order construct, could provide a more robust and comprehensive foundation for research in this evolving field.

CONCLUSIONS

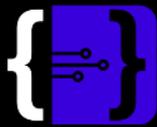
The outcomes of this study illuminate distinctive associations between citizenship behaviors in the online realm and the big five personality traits, diverging from citizenship activities observed in traditional offline environments. These personality traits are construed as dispositional features guiding individual interactions with the external world, distinct from characteristics shaped by external influences. As the digital landscape takes center stage for political discourse, comprehending how various personality traits influence engagement becomes invaluable. Pinpointing the personality traits linked with different facets of digital citizenship contributes to a richer understanding of the motivations, behaviors, and attitudes of individuals in online spaces. This knowledge holds potential implications for policymaking, aids in shaping digital literacy programs, and equips educators and professionals to better support individuals in their online pursuits.

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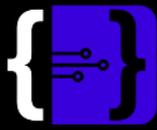
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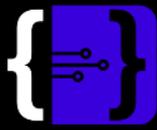
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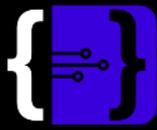
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