Institutional Trust and Social Media Use in Citizen-State Relations: Results from an international cross country vignette study

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Key words: social media, adoption, diffusion, citizen-state relations, trust, comparative study

Abstract

The objective of this article is to identify whether trust affects citizens' use of social media to initiate conversations with government on social media platforms. Using a vignette survey, we gathered data from the Canada, Greece, the Netherlands and Paraguay. Multivariate analysis showed that controlling for demographics and individual-level adoption factors, trust in government does not impact citizens' use of social media to initiate conversations about public issues, but trust in social media business and organizational infrastructure is (both in democratic countries as well as in flawed democracies). These results highlight how trust in institutions affect citizens' engagement and digital participation, and identifies conditions under which social media platforms may contribute to a vibrant democracy.

1. Introduction

Social media services such as Facebook and Twitter now serve as major platforms through which governments provide public service information to citizens [Bertot, et al. 2010a] and citizens and governments may engage in dialogues about public policies and public service quality [Bertot, et al. 2010b, Mergel. 2016, Homburg, et al. 2020, Bonsón, et al. 2019]. Uses of social media for participation and citizen engagement have been reported in Western parliamentary liberal democracies [Landemore. 2015, Homburg, et al. 2021a] as well as in flawed democracies [Homburg, et al. 2021b] and autocratic regimes [Homburg, et al. 2020, Qin, et al. 2017, Schlæger, et al. 2014, Homburg, et al. 2021].

Despite a growing conceptual and empirical body of knowledge on adoption of social media in citizen-state relations and on digital participation and citizen engagement, there are at least three gaps in the literature. The first one is that the majority of current literatures focus on why *government agencies* adopt social media for interaction with citizens [Bonsón, et al. 2019, Faber, et al. 2020, Silva, et al. 2019], and, with few exceptions [Homburg, et al. 2021a, Homburg, et al. 2021b, Homburg, et al. 2021, Lu, et al. 2016], researchers are yet to empirically study why *citizens* adopt social media to publicly voice concerns on governments' social media accounts [Medaglia, et al. 2017]. The second one is that many if not most studies focus on specific national contexts (be it Spain, Portugal, Germany, or Italy [Bonsón, et al. 2019, Silva, et al. 2019, Agostino. 2013, Hofmann, et al. 2013, Guillamón, et al. 2016]) with results possibly being biased towards features of specific national contexts; comparative studies are notably absent in the literature. The third one, which is related to the second 'gap' in the literature, is that current adoption and diffusion studies predominantly focus on individual users' attributes (such as perceived usefulness, perceived ease of use) with above-individual attributes of institutions (including trust in institutions, [Meijer, et al. 2012, Frederiksen. 2014, Pavlou, et al. 2005]) being scarce.

This study addresses the abovementioned gaps in the academic literature by testing hypotheses regarding trust, democracy and citizens' intentions to initiate conversations with government on social media, using primary survey data that were gathered in Canada, Greece, The Netherlands and Paraguay (for an explanation of the case selection, refer to section three). The following research question is used: to what degree does trust in a country's institutions affect citizens' use of social media to initiate interactions with government, and what role does a nation's degree of democracy play?

We aim to contribute to the literature by comparing antecedents of citizens' adoption of social media in citizen-state relations in four countries in Europe and the Americas (with

lower and higher democracy scores). We use a deductive, quantitative methodology to contribute to early stage theory formation.

The rest of this article is structured in the following manner. After a review of the literature on social media in state-citizen relations from the citizen's point of view, we develop hypotheses (section two). We discuss the overall research design, country selection, measurement issues and data gathering procedures (section three), which are at the heart of the presentation of results and data analysis (section four). We end the article with a discussion of the findings, suggestions for further research and an overall conclusion (section five).

2. Central Concepts and Hypothesis Development: underpinnings of a theory on citizens' adoption of social media in state-citizen relations

2.1 Definition of social media in citizen-state relations

Social media can be defined as platforms on which users can distribute texts, pictures, videos, or URLs, and on which other users can rate ('like'), share or respond to ('comment') content [Schlæger, et al. 2014, Welch, et al. 2005, Mergel, et al. 2013]. When applied in relations between citizens and state actors, social media allow (1) authorities to disseminate information more dynamically than by posting messages on websites, and (2) citizens to express concerns and initiate public debate among fellow citizens and public authorities. In practice, nowadays, platforms are increasingly accessible through mobile apps. Although many platforms also enable one-to-one communication ('direct messaging'), in this study we focus on the many-to-many public communication functionalities of social media. Throughout the study, we focus on citizens' public expressions concerning public services quality issues citizens may be confronted with and that render contributors both eligible to recognition and praise and vulnerable to criticism (by fellow citizens, politicians, and

officials). In doing so, we view social media both as an instrument that may potentially empower citizens and enable governments to listen to citizens' concerns, as well as an instrument that potentially exposes citizens' intentions and emotions and hence potentially makes citizens vulnerable (without citizens necessarily realizing this themselves at the time they are speaking up on particular topics).

2.2 Hypotheses development: underpinnings of a theory on trust in institutions and adoption of social media citizen-state relations

Meijer *et al.* [Meijer, et al. 2012] suggest that a sound citizen-state relation in which information is shared between citizens and state actors, requires trust. Notwithstanding intuitive appeal, the use in empirical studies of statements that refer to trust is complicated by the fact that trust is notoriously hard to define [Frederiksen. 2014, Pavlou, et al. 2005]. In this study, we conceptualize trust as an attribute of a relation between actors A and B (where B can be an individual or institution, [Homburg, et al. 2020]), and define trust as A's expectation that B will not exploit A's vulnerabilities, while B has the power and ability to do so [Pavlou, et al. 2005]. Trust has been identified as a precursor of adoption of electronic services by citizens generally [Carter, et al. 2005, Carter, et al. 2011, Horst, et al. 2007, Kurfalı, et al. 2017, Venkatesh, et al. 2011]. More particularly, Homburg *et al.* found that in Chinese citizen-state relations, citizens' trust in individual officials was positively associated with citizens' adoption of social media platform Weibo for reaching out to government (which underlines the importance of densely knit personal *quanxi* relationships in China), whereas citizens' trust in government institutions was not significantly associated with adoption [Homburg, et al. 2020].

In the context of citizen-state relations, we identify two connotations of trust: (1) a citizen's *trust in government* where government is an institution that provides public services

and creates public value [Welch, et al. 2005, Carter, et al. 2005, Carter, et al. 2011, McKnight, et al. 2002], and (2) *trust in the conglomerates of Internet Service Providers (ISPs), social media businesses and regulatory agencies that govern privacy and safety of transactions* [Kurfalı, et al. 2017, Venkatesh, et al. 2011, Rana, et al. 2016]. Both forms of trust can be related to institutions: either trust in government as an public service provider that acts competently, fairly and responsively, or trust in the governance of organizations (ISPs, social network companies, regulators) that provide the required infrastructure and communication services for digital citizen-state interactions.

Based on these concepts we infer that the more citizens perceive that any risks resulting from initiating a discussion with government will not harm them, the more likely they are to actually use social media to voice concerns over public service issues they may be confronted with. This leads to the formulation of H1 and H2.

H1	Controlling for other variables, the higher a citizen's trust in government, the higher the likelihood a citizen uses social media to address concerns or issues in citizen-state relations
H2	Controlling for other variables, the higher a citizen's trust in social media technological and business infrastructures, the higher the likelihood a citizen uses social media to address concerns or issues in citizen-state relations

We define 'democracy' as a set of principles and practices that institutionalises and protects the people's voice in collective decision-making. Principles and practices include – but are not limited to – free, fair and competitive elections with which representation is established and representatives act in accordance to citizens' preferences, respect for basic human and minority rights, due process and equality before the law, and a government apparatus that is capable of implementing policies in accordance with political decisions made by representatives.

It has been argued that social media can have both positive and negative impacts on democracy, depending on whether social media empower ordinary citizens or political elites [Morozov. 2013]. Best and Wade [Best, et al. 2009] found that there is a positive correlation between Internet penetration and democracy in countries across the globe, with the strength and sign of correlation displaying considerable variation across regions. We extend this finding to our line of reasoning by inferring that relations between trust and social media adoption will be stronger in democracies than in flawed democracies (hypothesis three).

H3	Controlling for other variables, the relations between trust in government and trust in social media technological infrastructures will be stronger for citizens living in democracies than for citizens living in flawed democracies.

2.2 Controls: demographics and adoption and diffusion variables

We control for two types of variables: demographic variables and known individual-level adoption and diffusion variables (Table 1). Demographic variables are included based on previous e-government adoption studies [Venkatesh, et al. 2011, Silva, et al. 2019, Venkatesh, et al. 2003], individual-level adoption and diffusion variables are included based on related studies of social media adoption in citizen-state relations in specific national settings [Homburg, et al. 2021a, Homburg, et al. 2021b, Homburg, et al. 2021].

Group	Variable	Definition
Demographic and personal attributes	Gender [Venkatesh, et al. 2011, Silva, et al. 2019, Venkatesh, et al. 2003]	Characteristics of men and women one identifies with most
	Age [Venkatesh, et al. 2011, Silva, et al. 2019, Venkatesh, et al. 2003]	Difference between now and one's birthyear
	Education [Venkatesh, et al. 2011, Silva, et al. 2019, Venkatesh, et al. 2003]	Highest level of education (primary, secondary, tertiary) one has completed
Individual level adoption and diffusion variables	Perceived effectiveness [Carter, et al. 2011, Kurfalı, et al. 2017, Rana, et al. 2016]	One's a belief that posting a message about an issue on social media will help solving a problem that specific citizen is confronted with

	Ease of Use and Skills [Carter, et al. 2005, Carter, et al. 2011, Rana, et al. 2016]	Perceived efforts it takes to post a message about an issue on social media
	Social Influence [Homburg, et al. 2020, Qin, et al. 2017, Carter, et al. 2005, Horst, et al. 2007, Kurfalı, et al. 2017, Rana, et al. 2016, Venkatesh, et al. 2003]	Degree to which a citizen perceives that important others believe he or she should use social media to speak up
	Fear of consequences [Homburg, et al. 2020, Igbaria. 1990, Zmud. 1979, van Deursen, et al. 2015, Lee, et al. 2011]	A citizen's general feelings of anxiety that result from consequences that are beyond the control of that particular citizen

Table 1: control variables

3. Research strategy and measurement issues

3.1 Questionnaire design and data gathering procedures

Considering the deductive character of the research objective, we chose a *large-n* research design and opted for an online survey questionnaire to gather quantitative data among citizens living in various countries around the world. The research question necessitates a comparison of survey data gathered in democratic and countries with various degrees of democracy. We selected four countries in Europe and the Americas with similar population sizes, and used the Economist Intelligent Unit's 2018 democracy index [Abu-Shanab. 2015, Högström. 2013] to select one country that qualifies as a full democracy and one country that qualifies as a flawed democracy per continent, under the condition that data gathering was possible. This led to the selection of Canada, Paraguay, the Netherlands and Greece (Table 2).

COUNTRY	POPULATION SIZE	DEMOCRACY SCORE	REGIME TYPE
Canada	38 million	9.15	Democracy
Greece	10 million	7.29	Flawed democracy
Netherlands	17 million	8.89	Democracy
Paraguay	7 million	6.24	Flawed democracy

Table 2: country selection, based on the Economic Intelligent Unit's democracy index

Within each country, we contracted Qualtrics to distribute an online questionnaire to a target population of above-eighteen year olds. The original questionnaire was drafted and tested in the English language (and used for the Canadian questionnaire). For use in the various target populations, the questionnaire was translated into Spanish, Dutch and Modern Greek for use in Paraguay, the Netherlands and Greece, respectively. The data were gathered in the summer of 2020.

3.2 Measurement of social media in citizen-state: the pothole vignette

The country selection yields challenges with respect to the measurement of especially the dependent variable (use of social media in citizen-state relations). As public tasks may vary from country to country (with medical insurance, local tourism marketing and water sanitation being examples of services that may be produced by public sector in one country and by markets in other countries), as may devolution of public tasks within a country, the use of *generic* items like "I would use social media to report complaints to the government 1=totally disagree 5=totally agree" is prohibitively problematic as respondents may interpret the notion of 'government' differently across various countries in the country selection, or even within those countries. In a similar fashion, different countries may display various sensitivities (gun control, Royalty, racial inequality, pro-life/pro-choice debates, for instance) that renders any analysis difficult when not controlled for in the analysis of responses. Steiner, Atzmüller and Su argue that in these circumstanced, the use of vignettes is called for. Vignettes are systematic descriptions of situations that are presented to respondents to elicit beliefs, attitudes or intended behaviors with respect to the situations presented in the description. Vignettes can be used in comparative research to control for local variations of situational content, and responses are less likely to be affected by social desirability than in regular questionnaires [Wallander. 2009, Steiner, et al. 2017].

In our study, we presented respondents with a vignette in which a neutral and general public issue was presented to respondents [Alexander, et al. 1978]: protagonist Trudy is confronted with a pothole in a public road [Agarwal, et al. 2019, Musaev, et al. 2018, Pak, et al. 2017, Seki. 2016] and uses social media to speak up about the pothole under his or her own name (that is, he or she does *not* react anonymously; see Appendix A for the vignette) [Homburg, et al. 2021a, Homburg, et al. 2021b, Homburg, et al. 2021]. The items measuring the respondent's prospective behavior ("I would do the same as Trudy did", "I would have also posted a message on the agency's social media page" and "I would have done the same as Trudy did when confronted with the same situation") were used as a proxy for respondents' actual social media adoption behavior, being the dependent variable in this study. Additionally, two items ("the situation is realistic'" and "I can imagine this situation happening to people") measured the perceived realism of the vignette [Moody, et al. 2018, Siponen, et al. 2010] for validation purposes. The resulting two-item, 1-5 realism scale (Cronbach's alpha = .811) resulted in satisfactory realism scores (overall mean realism score M = 4.23, SD = .81) for respondents from all four countries (Figure 1).
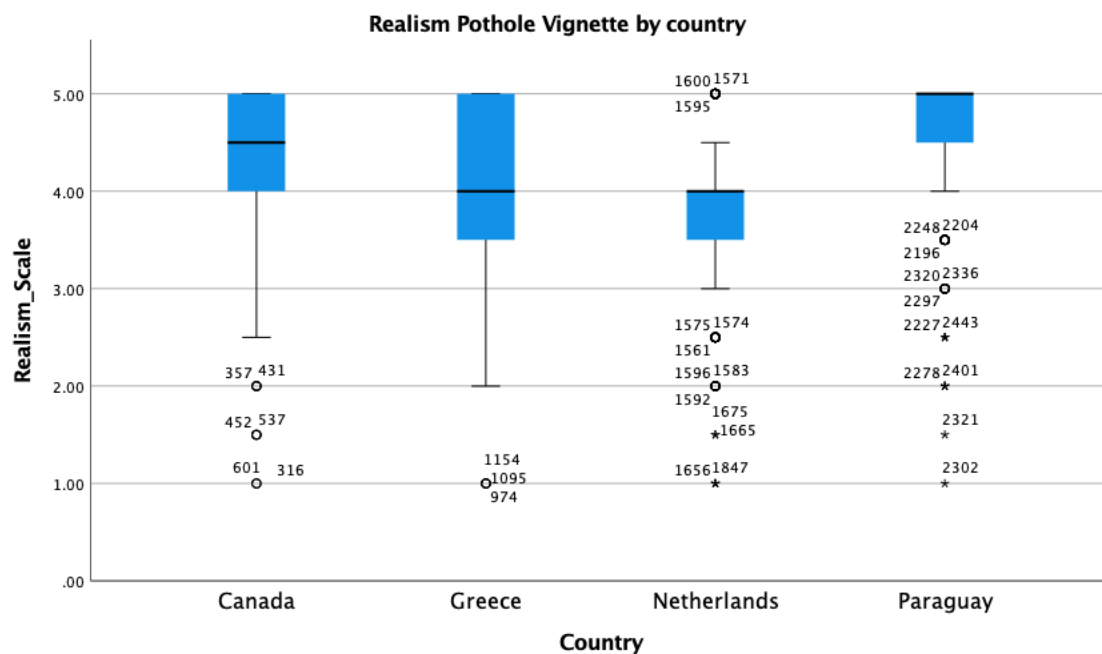

Figure 1: Vignette realism score by country

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3.3 Measurement of independent variables

Performance expectancy, ease of use, social influence, fear of consequences trust in government and trust in social media organizational and business infrastructure were measured with existing yet slightly contextualized Likert items to make a good fit with the context of social media use in citizen-state relations (see Appendix B for details).

3.4 Data screening and brushing up procedures

Data were screened for usability prior to conducting any statistical analyses. Case screening resulted in the discovery of zero variance in the responses of one Greek, three Dutch and two Paraguayan respondents (which suggests unengaged response behavior), on the basis of which the data of these respondents were removed from the data set. We did not identify any obvious outliers in age. Variable screening did not result in the discovery of missing values. In total 1215 useful observations could be recorded in the dataset.

3.5 Scale construction: exploratory factor analysis and reliability analysis

As there is scarce existing empirical research on social media in citizen-state relations in a global context, and to discover the underlying structure of the measured items, we carried out a factor analysis (principle component analysis with varimax rotation). As many items showed a correlation of at least .3 within at least one other item, factorability was assumed. The KMO measure for sampling adequacy was .872 (well above the required minimum of .6) and Bartlett's test of sphericity was significant (χ^2 (300) = 19387.98, p < .0001). All communalities were above .3, which further confirmed that each item shared at least some common variance with at least one other item. Based on these considerations, factor analysis was deemed to be suitable with all items. In the course of the exploratory factor analysis with Varimax rotation, a simple seven factor structure could be realized with which 75.7% of total

variance could be explained. Reliability of the items loading on specific factors was checked and this resulted in satisfactory results (all Cronbach's alpha levels above .7). Results of the factor analysis and results of the reliability tests of the constructed scales is reported in Table 3.

	1	2	3	4	5	6	7	Cronbach's alpha
PE1	.810							
PE2	.816							
PE3	.853							.902
PE4	.845							
EoU1		.852						
EoU2		.836						
EoU3		.867						
EoU4		.770						.918
FC1		.792						
FC2		.858						
TiG1			.858					
TiG2			.895					
TiG3			.914					.921
TiG4			.895					
T1				.803				
T2				.848				
T3				.854				.897
T4				.815				
SI1					.808			
SI2					.839			.861
SI3					.786			
FoC2						.786		
FoC4						.835		.737
FoC6						.797		
V1Road1							.887	
V1Road2							.849	.924
V1Road3							.891	

Table 3: factor analysis and reliability results Canada, Greece, Netherlands, Paraguay (n = 1215)

3.6 Common method bias

As any single source survey study, the methodology used in this study brings with it the risk of common method bias [Podsakoff, et al. 2003]. As the total variance in the unrotated

principal component analysis of all Likert items in the data set accounted for only 26,7% of all variance, we concluded that none of the factors explain the majority of variance and that common method bias was not likely to have occurred during the data gathering.

4. Results

4.2 Descriptive statistics: demographics

More than half of respondents (54.7%) identified with the male gender, and ages ranged from 20 to 87 (males: $M = 41.2$, $SD = 15.8$; females: $M = 39.3$, $SD = 15.0$). The highest level of completed education was elementary school for 1.9% of respondents, secondary education for 32.3% of respondents and postsecondary (college or university) for 65.8% of respondents. Education was dummy coded (0 = primary or secondary education, 1 = tertiary education). Details of demographics are reported in **Error! Reference source not found.**.

	Canada (n = 309)	Greece (n = 308)	Netherlands (n = 300)	Paraguay (n = 298)	Combined (n = 1215)
Gender (1 = female)	.62	.45	.32	.42	.45
Age	50.65	34.10	45.08	31.27	40.33
	(14.7)	(10.3)	(17.17)	(9.58)	(15.4)
Education (1 = higher)	.74	.69	.45	.74	.65
Social Media Use (pothole)	3.40	3.92	3.03	4.27	3.65
	(1.12)	(.91)	(1.09)	(.83)	(1.10)
1. *Perceived effectiveness*	2.52	3.15	2.79	2.86	2.83
	(1.02)	(.98)	(.94)	(1.10)	(1.04)
2. *Ease of use*	3.96	4.54	3.98	4.49	4.24
	(.86)	(.59)	(.77)	(.74)	(.79)
3. *Social influence*	2.34	2.74	2.54	2.96	2.64
	(1.05)	(1.05)	(.90)	(1.16)	(1.07)
4. *Fear of consequences*	2.78	2.77	2.78	2.60	2.73
	(.91)	(.91)	(.79)	(.99)	(.90)
5. *Trust social media organizational and business infrastructure*	2.48	2.95	2.68	3.18	2.82

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	(.99)	(1.00)	(.90)	(1.04)	(1.02)
6. Trust in government	3.21	2.68	3.25	2.12	2.82
	(1.09)	(1.03)	(.89)	(1.01)	(1.11)

Table 4: mean scores of variables by country, standard deviations in parentheses

Mean scores of responses to vignettes are also depicted in Figure 2. The scores measure the degree to which respondents in various countries indicate that they would have reported a pothole using social media under her or his own name.
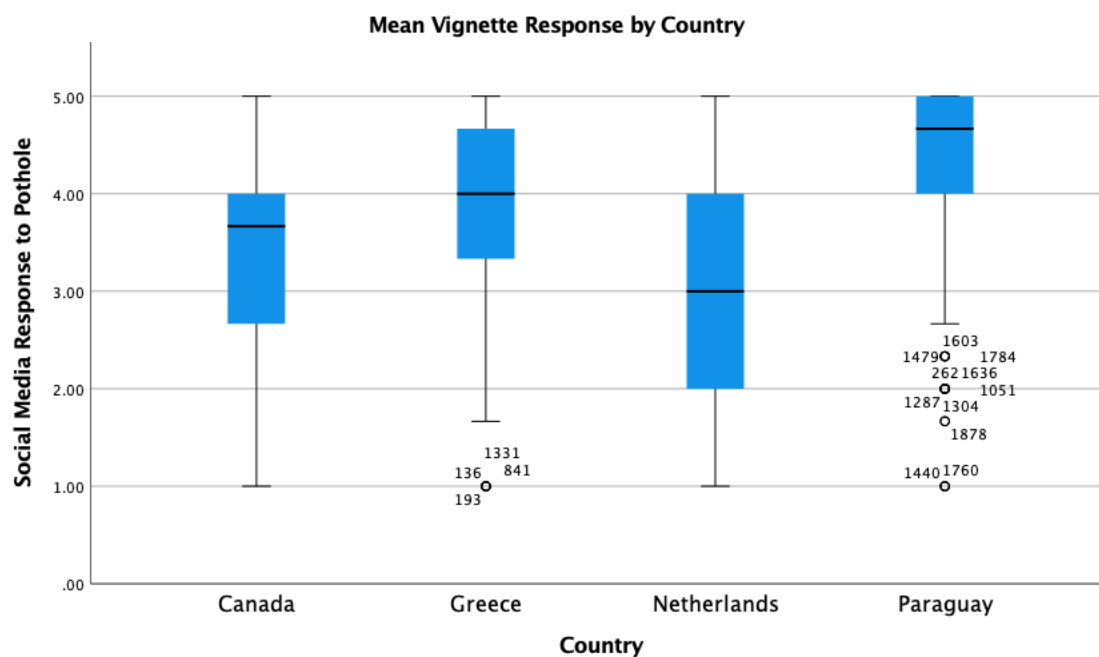

Figure 2: means of vignette responses in Canada, Greece, Netherlands, Paraguay (n = 1215)

4.1 Hypothesis testing

4.1 Model Assumptions

In order to test the hypothesis we used OLS multiple linear regression. Before the actual regression was implemented, we checked the following model assumptions for multiple regression analysis. Multicollinearity was checked by inspecting the correlations of the

independent variables and by inspecting the variance inflation factor (VIF) values of each

independent variable. As none of the correlations are above .7 and all VIFs were below 4, this

assumption is met. Homoscedasticity was checked using a scatter plot of standardized

residuals and predicted values; no anomalies were found. Independent errors were checked

using the Durbin-Watson statistic, and the value of 1.860 revealed no problems associated

with this assumption. The assumption of normally distributed errors was tested via the

inspection of unstandardized residuals. Inspection of the Q-Q plots revealed a relatively

normal distribution, and we concluded that this assumption was also met.

4.2 Main effects per country

In Table 5 the results of four separate multiple regression analyses (with unstandardized, non-

centered scores on social media use in four vignettes as dependents, standardized

coefficients) are summarized. Overall, results indicate that social media adoption is explained

by perceived effectiveness (Canada, Greece, the Netherlands but not in Paraguay), ease of use

(Canada and Paraguay, but not in Greece and not in the Netherlands), social influence

(Paraguay), and trust in social media business and organizational infrastructure (all four

countries), but not by trust in government (no country).

Using these data, it is possible to test hypotheses 1 and 2.

A significant regression equation was found to predict social media adoption in each of the

four countries, with trust in government not significantly predicting social media adoption

(Canada: ß = -0,036, p = n.s.; Greece ß = 0,106, p = n.s.; Netherlands ß = - 0.107, p = n.s.;

Paraguay ß = -0,051, p = n.s.). Therefore, hypothesis one receives no support. Trust in social

media business and organizational infrastructure significantly predicted social media

adoption (Canada: ß = 0.262, p < 0,001; Greece ß = 0,135, p < 0,01; Netherlands ß = 0,208, p

< 0,001; Paraguay ß = 0,225, p = 0,001), providing support for hypothesis two.

	Canada				Greece				Netherlands				Paraguay			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Gender (1 = female)	.003	.008	.008	.002	.067	.062	.053	.049	.030	.059	.060	.047	.091	.095	.096	.088
Age	-.106	.054	.054	.075	.108	.087	.084	.082	.031	.145*	.148*	.167**	-.008	-.045	-.045	-.019
Education (1= higher education)	-.003	-.008	-.008	.024	-.048	-.042	-.041	-.038	-.024	.000	.008	.002	-.014	.011	.012	.025
Perceived effectiveness		.311***	.309***	.286***		.285***	.264***	.259***		.319***	.327***	.279***		.106	.104	.090
Ease of Use		.240***	.239***	.210***		.046	.054	.033		.089	.097	.060		.171**	.171***	.136*
Social Influence		.142*	.143*	.049		.180**	.145*	.109		.136*	.142*	.109		.224***	.222**	.171**
Fear of Consequences		-.045	-.045	-.022		-.085	-.090	-.084		.101	.099	.085		-.106	-.108	-.108
Trust in Government			.005	-.036			.142*	.106			-.070	-.107			.011	-.051
Trust in SM Infrastructure				.262***				.135**				.208***				.225***
F	1.153	13.664***	11.900***	13.608***	1.884	10.450***	10.157***	9.750***	.244	9.929***	8.917***	9.511***	.841	7.255***	6.331***	7.350***
R^2 *(adjusted)*	.01	.24	.24	.29	.01	.19	.21	.27	.00	.17	.17	.20	.00	.12	.12	.16

Table 5: regression results by country, standardized coefficients, * p < 0,05, ** p < 0,01, *** p < 0,001

4.3 Testing of mediation by democracy

In order to test hypothesis three, we dummy-coded DemocracyDUMMY (0 for flawed democracies Greece and Paraguay, 1 for democracies Canada and the Netherlands) and regressed mean centered significant predictors and an interaction term. As no significant impact of the interaction term was observed, hypothesis three received no support: obviously, the significant impact of trust in social media business and organizational infrastructures was not stronger in democracies than in flawed democracies (Table 6 and Figure 3).

	Flawed Democracy (Greece, Paraguay) – Democracy (Canada, Netherlands) comparison	
	Main effects	Interactions
C_Perceived effectiveness	.164***	.156***
C_Ease of Use	.171***	.091***
C_Social Influence	.139***	.119***
C_Trust in SM Infrastructure	.227***	.158***
DemocracyDUMMY (Canada, Netherlands = 1)		-.270***
C_Trust in SM Infrastructure * DemocracyDUMMY		.056
F	99.423***	91.012***
R² (adjusted)	.245	.308

Table 6: regression results with DemocracyDUMMY interaction term, centered variables & standardized coefficients, * p < 0,05, ** p < 0,01, *** p < 0,001
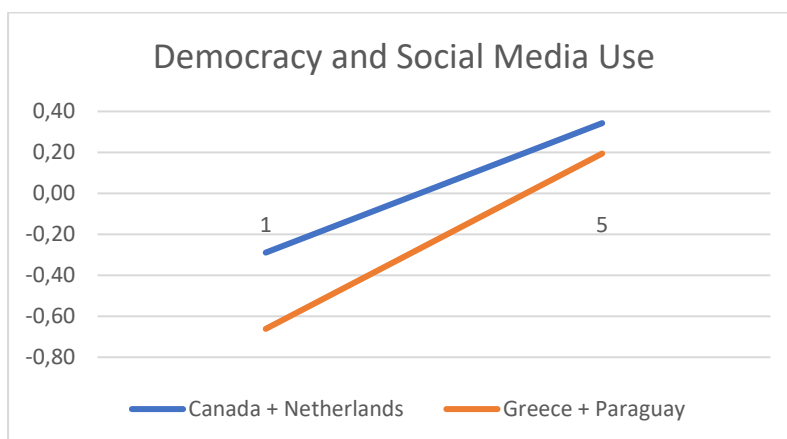

Figure 3: plot of interaction slopes

5   Discussion and conclusions

Around the world, public authorities have embraced a 'government 2.0' rhetoric [Bertot, et al. 2010a, Meijer, et al. 2012, Bekkers, et al. 2007] and have been looking for possibilities to reach out to citizens, foster transparency and boost responsiveness. Technological opportunity in the form of social media platforms has enabled especially local governments to actually realize this vision and since about a decade, governments' presence on social media platforms is hard to ignore [Bonsón, et al. 2019, Agostino. 2013, Hofmann, et al. 2013, Guillamón, et al. 2016, Silva, et al. 2019]. Until date, scarce studies are available that go beyond using secondary data and use metrics to explain citizens' adoption of social media to interact with public authorities. This study can be seen as one of the first studies that develops and tests citizens' social media adoption theory using data from respondents from around the globe. Findings indicate that trust in Internet providers and social media businesses, perceived effectiveness, ease of use and social influence are conducive to citizens using social media to interact with public authorities, whereas trust in government was not found to be significantly related to citizens' use of social media in citizen-state relations. The latter finding contradicts conjectures indicating that trust in government increases the probability that citizens invest in citizen-state relations [Bonsón, et al. 2019, Meijer, et al. 2012].

Arguably one of the more interesting findings of this study is that citizens' trust in proprietary social media infrastructures affects citizens' digital engagement and participation, and this holds equally in democracies and in flawed democracies. It must be noted that social media platforms such as Twitter and Facebook were designed as artefacts with which market segmentation algorithms transform users' interactions and engagement into monetary revenues; they were never intended to accommodate citizen political engagement. If we however observe and accept that social media platforms are, for many citizens, a preferred communication channel for interaction with governments on public service quality concerns,

and we know that citizens' trust in the safety and robustness of social media platforms determines whether citizens actually voice their concerns and interests, then social media platforms can be seen to constitute a contemporary public sphere and there will be a case to mitigate social media risks and promote citizens' trust in social media platforms. This calls for initiatives by both national and supranational governments to contest monopolies and stimulate competition in emerging information markets. Specific measures could include investing in social media education so that people understand benefits and risks of having an online presence, and requiring social media companies to be publicly accountable on how citizens are profiled, how companies deal with citizens' privacy rights, and how algorithms channel information flows to social media users [Smith, et al. 2020].

As any other study, this study does not come without limitations.

A first limitation is that the explained variance of the model is limited; only 16 – 30% of the variance in responses to the vignettes could be explained using the variables that were included. This is definitely less than explained variance in explanatory e-government services adoption studies (Carter and Bélanger's [Carter, et al. 2005] study yielded 85% explained variance, Carter, Schaupp, Hobbs and Campbell [Carter, et al. 2011] managed to explain 63%, and Kurfali *et al.* [Kurfalı, et al. 2017]'s explained variance was 58%. It must be noted though, that the population of these studies was more homogeneous than our global population, and, arguably more interestingly, studies focusing on explaining the adoption of social media by individual users display lower R^2 values; Khan's study on why individuals comment on Youtube videos yielded a R^2 of 22% [Khan. 2017], Homburg *et al.*'s study on Chinese citizen's adoption of Weibo to interact with governments produced a R^2 of 39% [Homburg, et al. 2020], and Al-Debei, Al-Lozi and Papazafeiropoulou's study on generic user's Facebook continuation decisions managed to explain 34% of total variance. Obviously,

social media adoption theories in general, and social media adoption studies in citizen-state relations are in need of inclusion of more variables to potentially boost explained variance. A possible source of influence is Malinen's review article, in which she identifies variables such as user motivation, user personality traits and cultural values held [Malinen. 2015]. Future research could arguable blend existing adoption models with the kind of variables suggested by Malinen.

A second limitation is the bias that was noted in the results section and that had to do with the high proportion of highly educated respondents, and the fact that the survey was conducted online, which means that only those respondents are included which already have specific ICT skills and access to resources. Although this is a characteristic this study shares with many other studies, and practicalities render alternatives to high volume electronic surveys rather prohibitive, considerable care must be undertaken to generalize findings of potentially biased surveys to larger populations.

In conclusion, we can say that our results explain why citizens across geographic boundaries and political regimes choose to use social media platforms to speak up and interact with public authorities. As such, this study follows up on previous studies' recommendations to further investigate why citizens show limited interest in engaging in dialogues, or speaking up in the first place. Our results suggest that, although responses are different in various countries and are likely to be contingent upon the type of problems people are confronted with, citizens' use of social media in citizen-state relations are explained by trust in platforms and technological infrastructures that make social media possible. On a theoretical level, this study contributes to our understanding of 'pull'-factors of electronic citizen-state interactions. As regards practical implications, authorities should realize antecedents of citizens' social

media behaviors and take these into accounts when realizing 'government 2.0' strategic visions.

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Literature

Appendix A: measurement used in questionnaire [Homburg, et al. 2021a, Homburg, et al. 2021b, Homburg, et al. 2021]

Variable	**Likert items (1=completely disagree 5=completely agree)**
Perceived effectiveness	- PE1 Posting messages on governments' public social media accounts would help in solving my problems - PE2 Posting messages on governments' public social media accounts increases my chances of realizing my objectives - PE3 Posting messages on governments' public social media accounts allow me to solve my problems more quickly - PE4 Posting messages on governments' public social media accounts would help my effectiveness in dealing with problems
Ease of use	- EU1 Learning how to use social media is easy for me - EU2 I find social media are easy to use - EU3 It is easy for me to become skillful at using social media - EU4 I find it easy to get social media tools to do what I want to do
Facilitating conditions	- FC1 I have the resources necessary to use social media - FC2 I have the knowledge necessary to use social media - ~~FC3 Using social media is not compatible with the rest of my online activities (R)~~ - ~~FC4 I can get help from others when I have difficulties using social media~~
Social influence	- SI1 People who influence me think I should use public social media to communicate with my government - SI2 People who are important to me think I should use public social media to communicate with my government - SI3 In general, most people around me use public social media to communicate with their government
Trust in social media organizational and business infrastructure	- T1 I feel assured that legal and technological structures adequately protect me from problems on social media - T2 I feel confident that encryption and other technological advances on social media make it safe for me to use it - T3 In general, social media are now a robust and safe environment
Trust in government	- TIG1 I feel that my government communicates information honestly - TIG2 I feel that my government is capable of doing its task - TIG3 I feel that my government is fair - TIG4 I feel that my government wants what is best for its citizens
Fear of consequences	- ~~FOC1 Any problems resulting from the actions by the characters in the stories will never go away~~ - FOC2 Something terrible would happen if I did what the characters in the stories did

	-	FOC3 While what the characters in the stories did could be harmful, I would be okay (R)
	-	FOC4 I am afraid of what may happen if I did what the characters in the stories did
	-	FOC5 Any problems resulting from what the characters in the stories did will go away in time (R)
	-	FOC6 Doing what the characters in the stories did could cause serious problems
	-	FOC7 My computer/telephone/tablet could be compromised if I did what the characters in the stories did
Use	-	USE1 I would do the same as Trudy did
	-	USE2 I would have also posted a message on the agency's social media page
	-	USE3 I would have done the same as Trudy did when confronted with the same situation
Realism	-	REALISM1 The situation is realistic
	-	REALISM2 I can image this situation happening to people

Appendix B: vignette [Homburg, et al. 2021a, Homburg, et al. 2021b, Homburg, et al. 2021]

'Pothole'	Trudy lives in a small urban community and travels to a neighboring city four times a week by a public road. Trudy notices that due to weather conditions, the condition of the road deteriorates up to the point where there are big cracks and holes in the road. As Trudy travels down this road regularly, she knows where the cracks and holes are, but she realizes that other people might crash and hurt themselves. Trudy is worried about what might happen to fellow-citizens and uses the public social media account of the public works agency responsible for road maintenance to post pictures of the holes and cracks in the road, and to notify the public works agency of the bad condition of the road under her own name.

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