"@Government There's a pothole in my street!": Canadian citizens' adoption choices of social media use in citizen-government relations

Abstract (93 words)
Social media platforms such as Twitter and Facebook offer new opportunities for co-production and interaction between citizens and government agencies. Until now, explanations of why citizens use social media to interact with government have been lacking in the literature. This article concludes on the basis of survey data gathered among Canadian citizens that social media use in citizen-government relations is explained by citizens' perceived effectiveness and trust in social media organizational infrastructure, with trust in government, social media anxiety and ease of use not having an impact. Implications for research and practice are discussed.

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Throughout the world, public policy makers are exploring and implementing initiatives with which social media platforms are used to increase transparency, enable citizens to access government data, and, eventually, to foster an open dialogue between government and citizens (Alam and Lucas, 2011; Bertot et al., 2010; Mergel, 2013; Schlæger and Jiang, 2014; Thomas and Streib, 2005). In Canada, various Open Government Action Plans (with the 2018-2020 National Action Plan on Open Government being the latest addition) and initiatives (such as the 2011-2012 Open Government initiative and the 2016-2017 Electoral Reforms discussion) have been developed with which a compelling rhetoric of openness, participation and engagement is conveyed (Longo, 2017; McNutt, 2014). In reality, however, actual use of social media platforms such as Facebook, Twitter, Youtube and Instagram in citizen-government relations is often limited to government agencies being passive on social media platforms (Gintova, 2019; McNutt, 2014) or to unilateral dissemination of service announcements to the general public without actual interaction (Gintova, 2019; Small, 2012). Clarke observed that Canadian governments' use of social media meant responsibilities for social media were siloed to public relations and communications units (Clarke, 2019). Arguably, many government social media initiatives rest on a model in which governments attempt to control dialogues with citizens and in which social media platforms are deemed irrelevant for policy making and public service delivery.

McNutt has argued that the most important barriers that prevent governments to have conversations with the 'outside world' on social media platforms are organizational, cultural and legal – not technological (Clarke, 2019; McNutt, 2014). This conclusion is echoed in social media adoption studies carried out in European local government contexts. Empirical studies have linked variance of European local governments' presence on social media platforms and levels of interactivity (in terms of prevalence of likes, shares and comments) on government accounts on platforms with demographic, socio-economic and political factors (Agostino, 2013; Bonsón et al., 2012; Bonsón et al., 2019; Faber et al., 2020; Hofmann et al., 2013; Silva et al., 2019).

Whereas academic studies have produced explanatory accounts for the relative paucity of social media adoption by governments, citizens' motivations and attitudes towards using social media platforms for interaction with governments have largely gone unnoticed. With few exceptions (Homburg et al., 2020; Lu et al., 2016), studies have yet to begin to explain why *citizens* would use social media to initiate conversations with government (Gintova, 2019) whereas, arguably, governments' well-intentioned initiatives to foster civic engagement and have actual open dialogues with citizens could benefit from a better understanding of why citizens choose to use social media platforms to initiate conversations with government – or of what it is that discourages citizens to do so (Clarke, 2019)

This article attempts to fill this gap in the literature and examines what factors explain Canadian citizens' adoption of social media platforms to communicate with Canadian government agencies. On a more societal level this article aims to provide a solid, empirical background on citizens' motivations and attitudes relating to interaction with government on social media platforms, on which, in a later stage, recommendations and government practices can be based. This might allow policymakers, government officials and those consulting them to gain insight in the 'citizen side' of social media interaction with

government, with a view to take these motivations into consideration when making and implementing policy. This study identifies factors by analyzing original survey data gathered in Canada. Although data was not gathered among citizens that were interacting with specific Canadian agencies, findings do offer valuable insights for every government agency that is trying to make sense of the 'government 2.0'-philosophy and particularly with the use of social media in citizen-government interactions.

The article is structured as follows. First, a review of the literature is presented and hypotheses regarding citizens' adoption of social media to interact with government agencies are stated. Second, the overall methodology, construction of the survey instruments and data gathering procedures are explained. Third, the data are described and analyzed for the purpose of hypothesis testing. The article is concluded with a discussion of findings, recommendations, implications for government and future research directions.

Citizens' adoption and diffusion of social media

Social media can be defined as platforms on which small pieces of digital content (text, pictures, videos, or URLs) can be distributed among many users, and on which users – increasingly through mobile devices - can rate ('like'), share or respond to ('comment') other users' contributions (Mergel and Bretschneider, 2013; Mergel, 2013; Schlæger and Jiang, 2014; Welch et al., 2005). When applied in relations between citizens and governments, social media allow (1) government agencies to disseminate information more directly and faster than by posting messages on websites, (2) policymakers and citizens to engage in co-production of solutions to societal problems (Clarke, 2019; Longo, 2017; Roy, 2006) and (3) citizens to express concerns about issues or poor quality of public services they may face (King and Brown, 2007).

Social media platforms such as Facebook, Twitter and Instagram have been used by legislative and executive public bodies to enable 'thicker' forms of participation (Leighninger, 2014) such as sourcing of ideas for a new constitution in Iceland (Landemore, 2015; McNutt, 2014), as well as 'thinner' forms of participation such as Immigration, Refugees and Citizenship Canada (IRCC)'s use of Twitter to respond to questions and inform the public about migration issues (Gintova, 2019), and citizens' use of Vancouver's VanConnect App to report infrastructure defects (Sjoberg et al., 2017).

According to Bonsón, content of dialogues is important in explaining adoption and diffusion of social media, and in this study we limit ourselves to more or less thinner forms of citizens' participation, in particular to citizens' reporting of poor public service quality. This choice was motivated by the overall deductive research design, which necessitates unambiguity with respect to contents of interaction between citizens and government, and the fact that this article is part of a broader, comparative study and inclusion of thicker forms of participation would render the comparison between countries with different governance systems prohibitively difficult. Furthermore, we would like to control for the external factor of respondents' ideological preference for consultation and participation.

In the remainder of this study, we focus on social media in citizen-government relations as a technological and institutional innovation (Criado et al., 2013). In the academic study of innovations and innovation management, a perennial question is how individuals' acceptance and use of an innovation can be explained. In order to develop hypotheses regarding adoption and diffusion of social media in citizen-government relations, we draw on two bodies of knowledge:

1. the more generic study of adoption and diffusion of web-based services in relations between citizens and governments (Azam et al., 2013; Carter and Bélanger, 2005; Horst et al., 2007; Kurfalı et al., 2017; Rana et al., 2016; Venkatesh et al., 2016b), and
2. studies of adoption and diffusion of social media by individual users generally (Al-Debei et al., 2013; Khan, 2017; Lai and Shi, 2015; Malinen, 2015).

In both bodies of knowledge, researchers make use of Venkatesh *et al*'s Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003; Venkatesh et al., 2011; Venkatesh et al., 2016a). UTAUT synthesizes a number of existing adoption models (such as Davis' Technology Adoption and Rogers' Diffusion of Innovations Theory). The basic UTAUT model pioneered by Venkatesh hypothesizes that an individual's adoption of a new technologies is impacted by an individual's expectation of the technology's performance, the technology's ease of use, peer pressure to use the technology and facilitating conditions. Subsequent renditions of the models applied in a wide variety of contexts have included other variables such as trust, personality traits, anxieties, et cetera (Venkatesh et al., 2016a). The model has also inspired researchers to explain citizens' adoption of ICTs in citizen-government relations (Homburg et al., 2020; Kurfalı et al., 2017; Rana et al., 2016; Welch et al., 2005). Below, we develop hypotheses that are at the core of our explanatory study of Canadian citizens' adoption and use of social media in citizen-government relations.

Performance expectancy and ease of use

According to many authors working from a UTAUT-frame of reference (Venkatesh et al., 2016a), a first and presumedly most influential set of variables (Venkatesh et al., 2003) is emerging from an individual's rational expectations of costs and benefits that are associated with technology. In the context of this study, benefits are associated with perceived effectiveness (PE), defined as a citizen's belief that posting a message about an issue on social media will help solving a problem that specific citizen is confronted with. This expectation is mirrored in Bonsón et al.'s (2019) statement that governments should avoid frustration on the part of citizens by making explicit how they intend to use citizens' social media inputs; the idea here is that citizens will only spend precious time and energy on online activities if they think these activities yield personal or civic benefits and value (Al-Debei et al., 2013; Longo, 2017). In generic e-government studies, a positive association between (1) perceived effectiveness of e-government, and (2) use was observed (Carter et al., 2011; Kurfalı et al., 2017; Rana et al., 2016); in Horst *et al*'s (2007) study, perceived effectiveness was not found to be associated with use. In a more generic study of why Facebook users generally keep coming back to the platform, Al-Debei, Al-Lozi and Papazafeiropoulou found that users' perceived value of social media platforms is an important determinant of users' decision to continue using the platform (Al-Debei et al., 2013). This has led us to formulate H1.

H1	The more a citizen perceives social media to be effective in addressing her or his concerns or issues, the higher the likelihood a citizen uses social media to address these concerns or issues in citizen-government relations

Apart from benefits, using social media can be expected to require efforts that are inversely associated with the technology's ease of use (EoU), defined as the degree of ease a citizen associates with using social media to reach out to government. The relevance of ease of use for technology adoption in citizen state relations was confirmed by Carter and Bélanger

(Carter and Bélanger, 2005), Carter, Schaupp, Hobbs and Campbell (2011) and Rana *et al* (2016) whereas no support was observed in Kurfali *et al*. (2017).

These elements of the line of reasoning lead to the formulation of H2.

H2	The bigger a citizen's ease of use with respect to social media, the higher the likelihood a citizen uses social media to address concerns or issues in citizen-government relations

Facilitating conditions

In the original UTAUT model, the variable 'facilitating conditions' (FC) refers to an individual user's access to an organizational and technological infrastructure to support the use of a specific technology (Venkatesh et al., 2003). In later applications (Carter et al., 2011; Rana et al., 2016), emphasis shifted to users' skills and knowledge. In this study, facilitating conditions are defined as the degree to which a citizen believes she or he possesses the required skills and knowledge to use social media to initiate a conversation with relevant government agencies or authorities. In e-government adoption and diffusion studies, facilitating conditions (as conceptualized in the abovementioned manner) were found to have a significant impact on citizens' intentions to use e-government services (Carter et al., 2011; Rana et al., 2016). This leads to the formulation of H3.

H3	The higher a citizen's level of facilitating conditions, the higher the likelihood a citizen uses social media to address concerns or issues in citizen-government relations

Social Media Anxiety

An addition to theories on technology adoption in citizen-government relations is the variable 'anxiety'. Especially early technology adoption models featured computer anxiety as a predictor for adoption (Igbaria, 1990; Zmud, 1979). The role of anxiety in the interaction of users with technologies has also been extensively studied in the digital divide and senior citizens literatures (Lee et al., 2011; van Deursen and Helsper, 2015). Another connotation of anxiety has been used in Homburg *et al.*'s (Homburg et al., 2020) study of citizens' use of social media in China's authoritarian governance regime. Here, anxiety does not play a role in the interaction of users with technology ('hitting the wrong button'), but rather with citizens' emotions related to being confronted with unanticipated and uncontrolled social media use consequences (Qin et al., 2017). An example of uncontrolled social media use consequences may be that a citizen's public social media message inadvertedly goes 'viral', possibly confronting the original contributor with unwanted attention, feelings of embarrassment, or reputational damage. These negative consequences do not necessarily result from governments' responses, but rather from responses by other social media users. In a study on adoption of e-government services in India, Rana *et al.* (Rana et al., 2016) concluded that anxiety negatively affected citizens' behavioral intention to use online government services. In Homburg *et al.*'s study of Chinese citizens' adoption of Sina Weibo as a medium for interaction in citizen-government relations in China's authoritarian governance regime, anxiety was negatively correlated with social media use (Homburg et al., 2020).

In this study, we focus on possible anxiety of social media use in the latter connotation and define 'social media anxiety' (SMA) as a citizen's general negative affective emotion of

arousal that results from consequences of individual citizens' use of social media that are beyond the control of that particular citizen. This leads to the formulation of H4.

H4	The more a citizen experiences social media anxiety in citizen-government relations, the lower the likelihood a citizen uses social media to address concerns or issues in citizen-government relations

Trust

According to Meijer *et al.* (Meijer et al., 2012), mutual trust is an essential ingredient for every sound citizen-government relation, and conducive to cooperative information relations between citizens and governments. Various authors have noted that the concept of trust is notoriously hard to define in various contexts (Frederiksen, 2014; Pavlou and Gefen, 2005). Moreover, in everyday usage, trust and fear may be seen as overlapping concepts. In this study, we conceptualize social media anxiety as an individual, internalized negative affective emotion, whereas trust is an individual (A)'s belief that exists only in reference to other individuals or institutions (B) (Homburg et al., 2020). We define trust as A's expectation that B will refrain from exploiting A's vulnerabilities while B has the power to actually do so (Pavlou and Gefen, 2005). Trust is conducive to adoption of electronic services by citizens (Carter et al., 2011; Carter and Bélanger, 2005; Horst et al., 2007; Kurfalı et al., 2017; Venkatesh et al., 2011). Homburg *et al.* found that in Chinese citizen-government relations, citizens' trust in individual officials was positively associated with the adoption of social media (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).

A closer inspection of existing studies reveals that there are at least two above-individual connotations of trust: trust in government (TIG) as an institution that provides public services and creates public value (Carter et al., 2011; Carter and Bélanger, 2005; McKnight et al., 2002; Welch et al., 2005), and trust in the conglomerates of Internet Service Providers, social media businesses and regulatory agencies that govern privacy and safety of transactions (T) (Kurfalı et al., 2017; Rana et al., 2016; Venkatesh et al., 2011). In our study, we make a distinction between trust in social media and its infrastructures (coined 'trust in social media organizational infrastructure;), and trust in government. The former is defined as the degree to which an individual believes that whereas there are potential risks in using social media, he or she will not be confronted with negative consequences resulting from the way technological infrastructures operate; trust in government is defined as the degree to which an individual believes governments acts competently, fairly and responsively. This leads to the formulation of H5 and H6.

H5	The larger a citizen's trust in social media organizational infrastructure, the higher the likelihood a citizen uses social media to address concerns or issues in citizen-government relations
H6	The larger a citizen's trust in government, the higher the likelihood a citizen uses social media to address concerns or issues in citizen-government relations

Control variables

In the first formulation of and empirical contributions to the UTAUT adoption models, relations between independent variables and adoption or use variables were hypothesized to

be moderated by variables like age and gender (Silva et al., 2019; Venkatesh et al., 2003; Venkatesh et al., 2011). Subsequent empirical studies have disregarded the moderators because of lack of theoretical motivations of the direction of the moderating effects, and because in empirical data sets, age and gender were asymmetrically distributed hence complicating the moderation testing (Kurfalı et al., 2017; Van Schaik, 2009). In our study we included age, gender and educational level as control variables.

Methodology

Overall design: vignette survey

We conducted a *large-n* research design and opted for an online survey questionnaire to gather data among Canadian citizens. To measure adoption of social media in realistic contexts, we presented respondents with vignettes in which a protagonist is confronted with a specific issue or problem related to poor public service quality and has chosen to voice her or his concerns on social media to address the problem.

In general, the use of vignettes in survey research has several advantages over more generic and abstract survey items like 'I would use social media to speak up about public issues'. Validity is increased as responses are embedded in a more concrete, realistic context; furthermore, impact of social desirability is limited (Steiner et al., 2017; Wallander, 2009). As the hypotheses to be tested relate to citizens either or not using social media to address public service quality concerns (and not, for instance, whether Twitter or Facebook was to be used to report a concern), we explicitly refrained from mentioning the social media platform the protagonist used. Furthermore, to prevent a specific government agency's reputation to confound the measurement, we also refrained from including the responsible agency as direct or indirect target for the citizen's social media activity.

Data collection and sampling

Qualtrics was commissioned to distribute an online questionnaire among a panel of Canadian citizens of 18 years and older. Data was not gathered through river-sampling but rather through double opt-in, actively managed research panels: respondents had to sign up and provide information on themselves before they were eligible for inclusion in randomized survey panels. This allowed for a much more representative panel from which data are extracted. Selected respondents received incentives (cash, gift cards, airmiles, charity donations or vouchers) to participate in the survey. Typically respondents are not invited often so they cannot be classified as professional survey takers. To avoid self-selection, survey invitations did not include specific details about the contents of the survey and were instead kept very general. Although Canada is a bilingual country, we opted for a questionnaire phrased in one language only to avoid possible comparability issues in the analysis of responses to statements; as most Canadians are able to use English, we chose English. Between 23 July and 27 July 2020, in total 309 usable observations could be recorded in the dataset. When we compare sample demographics with population demographics provided by Canada Statistics (Canada Statistics, 2020c; Canada Statistics, 2020a; Canada Statistics, 2020b), we see a slight overrepresentation of especially women and respondents having completed tertiary education (Table 1). Overall, we assess general representation to be consistent with differences being acceptable for the purpose of hypothesis testing.

	AGE			GENDER			EDUCATION	
	SAMPLE	POP. 2020		SAMPLE	POP. 2020		SAMPLE	POP. 2019
0-20	N/A	21,4	Male	37,8	49,6	Below upper secondary	1[1]	8
20-30	11,7	13,4	Female	62,2	50,3	Upper secondary and post-secondary non-tertiary	25[2]	33
31-45	26,2	20,4				Tertiary	74	59
46-60	32,3	19,9						
61 -	27,2	20,7						

Table 1: sample demographics compared to population demographics

Data screening and common method bias check

Before conducting any statistical analyses with SPSS version 27, data were screened for usability. There were no respondents with zero variance in scores on the Likert items. No obvious outliers in age could be identified. Variable screening did not result in the discovery of missing values. A possible hazard of data gathering with cross-sectional methods like surveys is the occurrence of common method bias (Podsakoff et al., 2003). We checked for this by inspecting the total variance in an unrotated principal component analysis of all Likert items in data set; if one factor contributed to more than 50% of the variance, there would be reason to assume problems associated with common method bias. In our data set, the first factor accounted for 28.0% of total variance, implying that none of the factors explain the majority of variance and common method bias is not likely to have occurred during the process of data gathering.

Measurement of variables

In total four vignettes were designed which address an audience as wide as possible (e.g., maximizing the possibility that any respondent can be confronted with the situations depicted in the vignettes) (Table 2).

VIGNETTE LABEL	VIGNETTE TEXT
'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.
'PASSPORT'	Jimmy submits a request for a new passport. Jimmy is a bit late as he has planned a visit to his family abroad in three weeks, and the regular procedure might take slightly over three weeks. Jimmy explains the situation to the civil servant that processes his request, and much to his surprise the civil servant explains that she will use the express procedure if Jimmy is willing to pay a 25% surcharge. Jimmy gladly accepts this offer, gets his passport within a week, and then finds out that no such thing as an official express procedure with a 25% surcharge exists. Although Jimmy appreciates the service

[1] Sample data includes primary education (only), not lower secondary education
[2] Sample data includes all secondary education (including lower secondary education)

	that was delivered to him, he feels bad about the situation and decides to share his experience on the issuing agency's public social media account under his own name.
'TAXES'	Vincent is a small business owner, as all people Vincent has to pay taxes on his revenues. Vincent has appropriately filed his taxes and did not make any mistakes. However, to Vincent's surprise the amount of taxes he has to pay according to the tax collection agency is far higher than it should be. Obviously, they have made a mistake and need to adjust the amount of tax Vincent needs to pay. Vincent is upset about this and decides to voice his discontent about this on the public social media page of the tax collection agency under his own name.
'VACCINATION'	Rebecca is a mother of two children and wants her children to be vaccinated against common diseases. The health department of the country in which Rebecca is a resident offers these vaccinations for free. Every parent in this country will receive a letter when their child is a certain age, appealing them to visit their doctor to obtain their vaccinations. Apparently, the health department has made a mistake and forgot to send the letter to Rebecca. Her children therefore missed their vaccination at the appropriate age. Rebecca is worried about this and decides to ask the health department on how she should proceed in order for her children to still obtain their vaccinations on their public social media under her own name.

Table 2: vignettes used in the study

Respondents were asked to score the perceived realism of the situation (which is used for validation purposes but not in the hypothesis testing in this study) and the degree to which he or she would react in the same way when confronted with such a situation We inspected the reported realism scores (measured on a two-item, five-point Likert scale) for each of the vignettes. Consistency of the measurement of realism was acceptable to good and reported levels of realism rather satisfactory (for details, refer to Appendix A). Based on the reported levels of realism of all vignettes used in the questionnaire we found no reason to exclude specific vignettes from the analysis.

Performance expectancy, ease of use and facilitating conditions were measured with multiple Likert items that were based on existing measurement constructs found in studies inspired by UTAUT (Venkatesh et al., 2003), yet slightly adapted to fit the context of social media use in citizen-government relations. The items are reported in Table 3.

VARIABLE	BASED ON	LIKERT ITEMS (1=COMPLETELY DISAGREE 5=COMPLETELY AGREE)
PERCEIVED EFFECTIVENESS	(Venkatesh et al., 2003)	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	(Venkatesh et al., 2003)	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	(Bamberg and Schmidt, 2003)	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
TRUST IN SOCIAL MEDIA ORGANIZATIONAL INFRASTRUCTURE	(Carter and Bélanger, 2005; Zhou, 2011)	T1 Social media have enough safeguards to make me feel comfortable using them to post personal opinions/experiences T2 I feel assured that legal and technological structures adequately protect me from problems on social media T3 I feel confident that encryption and other technological advances on social media make it safe for me to use it T4 In general, social media are now a robust and safe environment
TRUST IN GOVERNMENT	(McKnight et al., 2002)	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
SOCIAL MEDIA ANXIETY	(Osman et al., 1994)	SMA1 Any problems resulting from the actions by the characters in the stories will never go away SMA2 Something terrible would happen if I did what the characters in the stories did SMA3 While what the characters in the stories did could be harmful, I would be okay (R) SMA4 I am afraid of what may happen if I did what the characters in the stories did SMA5 Any problems resulting from what the characters in the stories did will go away in time (R) SMA6 Doing what the characters in the stories did could cause serious problems SMA7 My computer/telephone/tablet could be compromised if I did what the characters in the stories did
USE (X=PROTAGONIST'S NAME IN VIGNETTE)	(Moody et al., 2018)	USE1 I would do the same as X did USE2 I would have also posted a message on the agency's social media page USE3 I would have done the same as X did when confronted with the same situation
REALISM	(Moody et al., 2018)	REALISM1 The situation is realistic REALISM2 I can image this situation happening to people

Table *3*: measurement items used in questionnaire

Scale construction and descriptive statistics

To disconfirm potential overlap between related variables like trust in government, trust in social media organizational infrastructures, and social media anxiety, we carried out a

principle component analysis in order to identify the underlying structure of the measured variables in the data set (for a detailed description, refer to Appendix B). On the basis of the factor loadings (and interpretation of the factor items), we constructed scales for perceived effectiveness (four items), ease of use (six items including the first two items of facilitating conditions), trust in social media organizational infrastructure (four items), trust in government (four items), social media anxiety (three items), and social media use (12 items for responses to four vignettes); no scale could be constructed for facilitating conditions. Appendix C contains more detail on these matters.

Regression results and hypothesis testing

Multiple regression analysis was used to test the hypotheses. The model assumptions for such an analysis were met: the correlations between the independent variables and relatively low VIF scores signal no problems with multicollinearity; homoscedasticity was checked using a scatter plot of standardized residuals and predicted values and no anomalies were found. Independent errors were checked using the Durbin-Watson statistic, and the values of 1.95, 1.76, 2.10, 2.10 and 1.91 (for the social media use scores in the respective vignettes, and the vignettes combined) revealed no problems associated with this assumption. Inspection of the Q-Q plots revealed a relatively normal distribution, therefore allowing for the conclusion that this assumption was also met.

Findings

Appendix D presents the standardized regression coefficients of five separate multiple regression analyses (with scores on social media use in four vignettes, and of all vignettes combined as dependents). In general, regression coefficients indicate whether, keeping other independent variables constant, a correlation can be inferred between each of the respective independent variables and the dependent variable in the larger population the sample was taken from. Therefore, inspection of regression coefficients, coefficients' signs, and their associated calculated probabilities (p-levels) allow us to test our hypotheses. Here we discuss the hypothesis testing in the context of three major findings.

Trust in social media infrastructure, government, impacts use

From the results of the regression analysis, we found that, controlling for other variables, citizens are more likely to interact with government when they trust the social media organizational infrastructure (with which hypothesis five was supported). We found this support for each vignette individually, but also for all vignettes combined (ß = .373, $p < 0{,}001$, see Appendix D for more details), and the regression coefficient ß indicates that this type of trust has the biggest impact on citizens' use of social media in citizen-government relations. Citizens having more trust in government, on the other hand, were not found to be more likely to use social media to interact with government than citizens having less trust in government, again controlling for other variables (ß = -.088, p = n.s., hence, hypothesis six was not supported). These findings indicate that trust in government institutions is less relevant for explaining digital citizen-government relations than many researchers and commentators are assuming. They are, however, in line with results from Homburg *et al*.'s (Homburg et al., 2020) study, and underline Roy's observation that information intermediaries have a key role in pending democratic reforms and manners in which citizens and governments interact, learn, and exercise accountability (Roy, 2006).

Responsiveness and reciprocity are important in digital citizen-government relations

A second major finding is the relevance of Canadian citizens' perceived effectiveness in the explanation of why citizens choose to use or not to use social media platforms to share experiences with public services online. Controlling for other variables, citizens that expect their social media behavior actually pays off are more likely to initiate digital conversations than citizen that to lesser degrees expect that their digital voice has impact. We found support for hypothesis one for each vignette individually and for all vignettes combined (ß = .348, p < 0,001, see Appendix D for more details), which provides support for hypothesis one).

This finding provides empirical backing for Culver and Howe's conclusion that awareness of consultation outcome matters for those who choose to be involved in civic conversations (Culver and Howe, 2004), and for Longo's statement that government engagement exercises must be transparent in reporting on how citizens' social media messages were evaluated. Hypothesis two (concerning ease of use) was supported to a limited degree (ß = .102, p < 0,05 for all vignette combined but no support emerging from responses to vignettes two, three and four). Hypotheses 3 (facilitating conditions) was not tested as the relevant independent variable 'facilitating conditions' could not be constructed and two items (FC1 and FC2) were combined with the items with which Ease of Use was measured.

Social media anxiety exists but does not limit social media use

With respect to social media anxiety, we observed that respondents reported experiencing social media anxiety (five-point scale, *M* = 2.78, *SD* = .91). Controlling for other variables, citizens reporting higher levels of social media anxiety are *not* more likely to initiate digital conversations with government than citizens with lower levels of social media anxiety (all vignettes combined ß = .-.086, p = n.s., with a significant regression coefficient for vignette four only). Therefore, hypothesis four was not supported: social media anxiety nor limits, nor promotes conversations between citizens and governments on social media platforms.

Discussion and critical reflections

This article provides systematic empirical evidence that allows for a critical reflection on some of the assumptions that are presented in the more conceptual or agenda-setting 'digital engagement'-literatures, and for informing Canadian governments of what lessons should be taken into account, should they wish to take citizens' commentary on social media platforms seriously. Below, we present two key elements of how we think a critical reflection should look like, and discuss limitations of our study.

Trust in social media organizational infrastructures

When considering social media platforms as intermediaries, one should take into account that proprietary social media platforms such as Twitter, Facebook and Instagram were once designed as artefacts with which market segmentation algorithms transform users' views, likes and shares into monetary revenues, and are not necessarily equipped to accommodate citizen engagement. If, however, we accept that social media platforms for many citizens are platforms of choice for valued interaction with governments, 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 there will be a case for governments to promote citizens' trust in social media platforms. Contemporary discussions focus on possible roles for national and supranational institutions to contest monopolies and stimulate competition in emerging information markets.

Safeguarding citizens' trust in social media platforms calls for initiatives by Canadian governments and international institutions. For instance, policies could push Big Tech companies to be publicly accountable and transparent on matters such as (a) how citizens are profiled, (b) how algorithms determine which information flows are channeled to its users (Smith and Desrochers, 2020), (c) how privacy is valued and (d) how platforms balance freedom of speech against combatting fake news. Another recommendation can be found in education, while a lot of people have an online presence on social media, this does not automatically prove that they understand its benefits, risks, privacy policy and so further.

Our results demonstrate that low trust in social media organizational infrastructures can limit citizens' willingness to interact with government on the platforms. It could potentially be beneficial to invest in education in which citizens are informed on the actual risks, benefits and (privacy) considerations of different social media platforms, in the view of this not being a black box for some of its users.

Reciprocity and responsiveness in digital conversations

A second element concerns reciprocity and responsiveness in digital conversations between citizens and governments on social media platforms. At least for the thinner forms of participation on which this study focuses, the impact of perceived effectiveness signals a distinctive transactional logic behind today's citizens' engagement on social media platforms. This logic underlines the suggestion to provide citizens with incentives or other tokens of appreciation to stimulate digital engagement on social media platforms (Longo, 2017). It must be noted that our conclusion is a conclusion on *perceived* effectiveness, not objective effectiveness.

In the light of these conclusions we would like to recommend, next to the recommendations mentioned above, to embark on a communication-based approach in which citizens become able to receive follow-up information on their interaction. While the government might undertake action in reaction to a complaint, this might not always be visible for citizens, which would lead them to the conclusion that their contribution was not effective. A clear communication strategy, arguably making use of promising technologies such as sentiment analysis and social media listening (Longo, 2017) could increase the perception of effectiveness.

Conclusion: Limitations to consider

This study set out to explain Canadian citizens' 'thin' political participation on social media platforms by confronting adoption hypotheses with empirical data gathered from a vignette survey. Using data from 309 respondents living in Canada, this study demonstrates that (1) citizens' trust in social media organizational infrastructures, (2) perceived effectiveness of social media use, and, to a lesser degree, (3) ease of use are factors impacting citizens' adoption of social media platforms to share experiences with poor public service quality. These findings can only be reported against the background of a number of limitations, which we would like to highlight.

First, we explicitly limited ourselves to 'thinner' forms of participation, and 'thicker' online participation behaviors (such as those online communications about necessity of policy changes, legitimacy and legality of electoral outcomes, or necessity of international treaties) may be explained with different variables and lines of reasoning.

Second, the explained variance in our models (20% for the vaccination vignette to 36% for all vignettes combined) leaves room for the inclusion of other explanatory variables. On the one hand, there may be candidate variables at the individual level, such as citizen's personality traits and cultural values held (Malinen, 2015). On the other hand, there may be variables related to government communication strategies which explain variance, such as other ways to communicate outside of public social media platforms.

Finally, conclusions in this paper are based on a cross-sectional research design with which data from a relatively large number of respondents were gathered at one moment in time – which allowed us to rigorously test our hypotheses. A general limitation of the study is that – unintentionally - data were gathered during a period in which public life was severely disturbed by the spread of the SARS-CoV-2 virus, causing an outbreak of COVID-19. The associated anxieties and changed daily habits individual citizens may be faced with may have impacted the respondents' responses. This may be particularly relevant for the responses to the 'missed vaccination'-vignette, a vignette that was proposed and designed before the severity of the COVID-19 crisis became clear. From the current data, it is impossible to deduce whether there was a COVID-bias to the response; replication of the study may be warranted to assess the consistency of findings over time.

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Appendix A: perceived realism for various vignettes (scores 1 – 5)

	CRONBACH'S ALPHA	*M* (*SD*)
REALISM VIGNETTE 1	.851	4.32 (.74)
REALISM VIGNETTE 2	.898	3.38 (1.18)
REALISM VIGNETTE 3	.838	3.96 (.87)
REALISM VIGNETTE 4	.919	4.05 (.89)

Appendix B: results of the factor analysis

	COMPONENT								
	1	2	3	4	5	6	7	8	9
EOU1	.899								
EOU2	.899								
EOU3	.869								
EOU4	.829								
FC1	.797								
FC2	.886								
TIG1		.861							
TIG2		.904							
TIG3		.931							
TIG4		.929							
PE1			.852						
PE2			.835						
PE3			.872						
PE4			.880						
T1				.803					
T2				.808					
T3				.819					
T4				.818					
V3TAXES1					.879				
V3TAXES2					.861				
V3TAXES3					.885				
V2PASSPORT1						.843			
V2PASSPORT2						.832			
V2PASSPORT3						.823			
V4VACCINE1							.871		
V4VACCINE2							.805		
V4VACCINE3							.862		
V1ROAD1								.854	
V1ROAD2								.802	
V1ROAD3								.845	
SMA2									.793
SMA4									.871
SMA6									.833

Factorability of all Likert items in the data set was examined and all items showed a correlation of at least .3 within at least one other item, suggesting factorability. The Kaiser-Meyer-Olkin measure for sampling adequacy was .865 (well above the required minimum of .6) and Bartlett's test of sphericity was significant (χ^2 (528) = 9242.794, $p < .001$). All communalities were above .3, further confirming that each item shared at least some common variance with at least one other item. In the course of the actual factor analysis with

Varimax rotation, a simple factor structure could not be realized with all items included. After elimination of SMA1, SMA3, SMA5 and SMA7, and FC3 and FC4, a 9-factor solution could be identified with which 82.9% of total variance could be explained.

Appendix C: descriptives of measures in the sample (n=309)

	CRONBACH'S ALPHA (NUMBER OF ITEMS)	*M* (*SD*)	1.	2.	3.	4.	5.	VIF
GENDER (1=FEMALE)		.62 (.48)						
AGE		50.6 (14.7)						
EDUCATION (1=HIGHER)		.74 (.43)						
V ROAD	.935 (3)	3.40 (1.12)						
V PASSPORT	.940 (3)	3.17 (1.27)						
V TAXES	.968 (3)	2.41 (1.30)						
V VACCINATION	.945 (3)	2.99 (1.28)						
V ALL VIGNETTES	.930 (12)	2.99 (.98)						
1. PERCEIVED EFFECTIVENESS	.919 (4)	2.52 (1.02)	1					1.13
2. EASE OF USE[3]	.937 (6)	3.96 (.86)	.086	1				1.07
3. TRUST IN SM INFRASTRUCTURE	.915 (4)	3.30 (2.20)	.301**	.242**	1			1.18
4. TRUST IN GOVERNMENT	.935 (4)	3.21 (1.09)	.200**	.123*	.195**	1		1.07
5. SOCIAL MEDIA ANXIETY	.789 (3)	2.78 (.91)	.046	-.095	-.076	-,008	1	1.01

[3] Merged with FC1 and FC2

Appendix D: Regression results

	POTHOLE		PASSPORT		TAXES		VACCINATION		ALL	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
GENDER (1=FEMALE)	.003	-.012	-.113	-.092*	-.142*	-.131	-.087	-.078	-.111	-.090
AGE	-.106	.069	-.035	.087	-.011	.111	-.083	.023	-.072	.088
EDUCATION (1=HIGHER EDUCATION)	-.003	.029	-.075	-.027	-.014	.045	-.108	-.079	-.065	-.013
PERCEIVED EFFECTIVENESS		.324***		.275***		.254***		.254***		.348***
EASE OF USE		.198***		.058		-.011		.095		.102*
TRUST SM IN INFRASTRUCTURE		.300***		.287***		.379***		.222***		.373***
TRUST IN GOVERNMENT		-.048		-.114*		-.059		-.055		-.088
SOCIAL MEDIA ANXIETY		-.019		-.052		-.054		-.141***		-.086
F	1.153	16.327***	1.872	10.121***	2.059	13.404***	2.255	9.188***	1.878	21.123***
R^2	.011	.305	.018	.214	.020	.265	.022	.197	.018	.362

Impacts of independents and control variables are presented with standardized regression coefficients ß, *p<0.05; ** p<0.01; *** p<0.001)