

A Literature Review of Channel Choice in E-government: Changing Society, Gaps in Knowledge, and Model Development

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1. Introduction

Channel choice research in citizen-government or business-government interaction is a specific subtopic within the broader area of e-government. Most of this review examines that subtopic, though I have incorporated some other aspects of citizen-government interaction that might be of use in future channel choice studies to prevent myopia due to restrictions on factors that are considered to influence channel choice. This review focuses on literature produced in western countries, primarily the Netherlands, the U.S., and Canada, due to similar economic and technological situations, and on studies conducted largely between 2011 and 2017, with exceptions for some influential works written earlier.

Bélanger & Carter (2012, p. 364) define e-government as “the use of information technology to enable and improve the efficiency with which government services are provided to citizens, employees, businesses and agencies”. Other researchers allow the term to cover a broader range of citizen-government or business-government interactions, such as problem solving or policy research, in addition to providing services (Reddick & Turner, 2012, Nam, 2014). Reddick & Turner (2012) define channel choice in e-government as the use of a channel, in their study either phone, office, website, or email, to interact with the government to achieve some end.

The digital divide has played a significant role throughout this literature and there are now three recognized levels of the divide. Scheerder, van Deursen, & van Dijk (2017) distinguish between them in this way: the first-level divide occurs when only some people have access to technologies, specifically Internet access. The second-level refers to a skill and use divide, since by the mid-2000s, access to technology was becoming more equitable in many Western countries, but the skills to effectively use it didn’t always accompany that access. The third-level goes beyond basic skills to focus on discrepancies in outcome (Scheerder, van Deursen, & van Dijk, 2017).

2. Channel Choice Determinants: Factors That Influence Choice

The channel choice determinants, or possible determinants, discussed here are the factors studied most often that can influence channel choice in citizen-government interaction. In a foundational study in the field, Pieterse & van Dijk (2007) consider six main categories of factors that determine channel choice: habit,

channel characteristics, e.g. speed, ease of use, accountability; task characteristics, e.g. complexity, ambiguity; situational constraints, e.g. availability, emotions, uncertainty, need for closure, importance of consequences; experience; and personal characteristics, that is, demographics. All these factors reappear in different combinations, with new factors added and others removed, in the channel choice research of the following decade. Reddick & Turner (2012) consider demographics, this time in the specific context of the digital divide; however, they add new factors to their study: the purpose of the interaction, a person's public service values, and, in what might have been a first in channel choice research, user satisfaction. They noticed changes to the nature and severity of the divide, changes which have been expanded upon by Scheerder, van Deursen, & van Dijk (2017) in their discussion of the third-level divide. Reddick & Turner (2012) concluded that citizens need multiple channels and, more specifically, that people may use multiple channels in certain orders for different problems, which is a perspective that had not been considered by Pieterse & van Dijk (2007) who, while they examined a wider range of factors, did so in the context of a static point in time.

Reddick & Anthopoulos (2014) investigated many of the same factors as previous researchers, focusing on the digital divide, user satisfaction, and the nature of interaction, but adding security and privacy concerns. They left out the channel characteristics and experience factors of Pieterse & van Dijk (2007) but the nature of the interaction could be viewed as including aspects of task characteristics and situational constraints, since these factors involve motivations for choosing one channel over another, e.g. for problem solving or because it was compulsory. van den Boer, Pieterse, van Dijk, & Arendszen (2015) consider many of the same factors as previous researchers, including task characteristics, relationship characteristics, situational factors, and channel characteristics but they begin to distinguish between channel choice and source choice where previous researchers seem to have worked under the assumption that they were functionally the same. Ebbers, Jansen, Pieterse, & van de Wijngaert (2016) investigate how task characteristics, channel characteristics, personal characteristics, and habits impact channel choice but they set out to consider irrational factors that have gone uninvestigated till now, though they are less than successful in that venture, as I'll discuss below.

Zuiderwijk, Janssen, & Dwivedi (2015) examine performance expectancy, effort expectancy, social influence, and facilitating conditions. While theirs is not a study specifically about channel choice but about technology acceptance and open data from e-government sources, it is mentioned here because social influence seems under-researched in the channel choice field. Madsen & Kraemmergaard (2016) began with Teerling & Pieterse (2011)'s proposed model of citizen's multichannel behaviour but departed further from the traditional factors considered by channel choice researchers by examining the influence of citizen-to-citizen interactions on subsequent citizen-to-government interactions. They concluded that administrative literacy was needed in addition to digital skills. van den Boer, Arendszen, & Pieterse (2016) and van den Boer, Pieterse, Arendszen, & van Dijk (2017) diverge from the usual citizen-government approach by considering business-government channel choice, although they focus on individuals within businesses rather than on businesses as discrete entities. They also acknowledge that their findings may be hard to generalize outside of a business environment.

van den Boer, Pieterse, Arendszen, & van Dijk (2017) try to consolidate more variables than most into a single model, including perceptions of source and channel characteristics, prior experiences, task characteristics, situational factors, social influences, perceived characteristic of the relationships with a source, and personal and organizational characteristics such as position in organization and organization size. In contrast, Carter, Weerakkody, Phillips, & Dwivedi (2016) limit their focus to trust of the internet and trust of government, perceived usefulness, and whether knowledge of services affect e-government use. This narrow view may be why they thought it too early to develop a theory of channel choice behaviour while van den Boer, Pieterse, Arendszen, & van Dijk (2017) tried to develop the most ambitious channel choice model to date.

3. Findings: Trends in Citizen-Government Interactions

There have been over a decade's worth of findings on the possible determinants of channel choice in e-government, many of which build upon each other, some of which seem to contradict each other. For instance, throughout the last ten years, the demographic trends regarding the digital divide have been noteworthy since age is the only predictor studied in 2007 has continuously been found to predict e-government use (Pieterse & van Dijk, 2007; Reddick & Turner, 2012). Gender no longer predicts e-government use and education no longer predicts channel choice use in the same ways (Ebbers, Jansen, & van Deursen, 2016; Ebbers, Jansen, Pieterse, & van de Wijngaert, 2016). Habit has not been studied as often as demographics, but has been

found to influence channel choice, as have the more often studied task characteristics (Pieterse & van Dijk, 2007; Ebbers, Jansen, Pieterse, & van de Wijngaert, 2016; van den Boer, Pieterse, Arendsen, & van Dijk, 2017). Factors that have been repeatedly found to affect whether citizens adopt e-government include perceived usefulness and perceived ease of use (Nam, 2014; Carter, Weerakkody, Phillips, & Dwivedi, 2016). Perceived risk has been studied only once in the channel choice studies I've found (Carter, Weerakkody, Phillips, & Dwivedi, 2016). The effect of trust on e-government use has been more divisive than other factors, with some finding that it does influence choice (Ebbers, Jansen, Pieterse, & van de Wijngaert, 2016), others finding that it does not (Nam, 2014), and still more finding that trust of the internet does influence use but trust of government does not (Carter, Weerakkody, Phillips, & Dwivedi, 2016). Researchers are similarly divided on the issue of whether prior experiences predict e-government use (Pieterse & van Dijk, 2007; van den Boer, Pieterse, van Dijk, & Arendsen, 2015; van den Boer, Pieterse, Arendsen, & van Dijk, 2017). Earlier research indicated that social conditions influence channel choice but it wasn't until 2016 that this seemed to be confirmed (Reddick & Turner, 2012; Madsen & Kraemmergaard, 2016; van den Boer, Arendsen, & Pieterse, 2016). This is not surprising since Scheerder, van Deursen, & van Dijk, 2017 have found that sociodemographic and economic determinants have been studied much more often than social, cultural, personal, material, and motivational factors.

Marketing was examined as a factor earlier on, but later studies don't discuss it often, possibly assuming citizen awareness of e-government now that it has existed for some time (Pieterse & van Dijk, 2007; Teerling & Pieterse, 2011). However, future researchers may want to reassess this assumption given the current gap between internet access and internet use outcomes (Scheerder, van Deursen, & van Dijk, 2017). Bertot, Jaeger, et al. (2013) suggest involving libraries more integrally in the citizen-government relationship, which could improve outcomes, by providing librarians with the information and tools they need to help citizens more successfully connect with the government, especially given the number of interactions that are now required to be conducted online (Bertot, Jaeger, et al. 2014).

4. Predominant Methods

Of the studies examined here, eight used surveys (Reddick & Turner, 2012; Nam, 2014; Reddick & Anthopoulos, 2014; Zuiderwijk, Janssen, & Dwivedi, 2015; Carter, Weerakkody, Phillips, & Dwivedi, 2016; Ebbers, Jansen, Pieterse, & van de Wijngaert, 2016; Ebbers, Jansen, & van Deursen, 2016), one of which was longitudinal (Bimber & Copeland, 2013); four studies used mixed methods research (MMR) (Teerling & Pieterse, 2011; van den Boer, Pieterse, van Dijk, & Arendsen, 2015 [part 1 of an MMR approach]; van den Boer, Arendsen, & Pieterse, 2016 [part 2 of an MMR approach]; van den Boer, Pieterse, Arendsen, & van Dijk, 2017), two used literature reviews (Bélanger & Carter, 2012; Scheerder, van Deursen, & van Dijk, 2017), and two used combinations of interviews and focus groups (Pieterse & van Dijk, 2007; Madsen & Kraemmergaard, 2016). Two articles with a more library-government focus used MMR (Bertot, Jaeger, et al, 2013; Bertot, Jaeger, et al, 2014). Many of the quantitative studies lamented the lack of nuance regarding human behavior that qualitative studies or mixed methods research might provide (Reddick & Turner, 2012; Nam, 2014; Ebbers, Jansen, Pieterse, & van de Wijngaert, 2016). Some of these calls for qualitative studies specifically address the lack of research regarding new digital technologies and channel choice (Reddick & Anthopoulos, 2014). Only one quantitative study called for further quantitative studies with the goal of discovering differences between the choices of individuals in different positions in business (van den Boer, Arendsen, & Pieterse, 2016). Only two studies examined here (Teerling & Pieterse, 2011; Bélanger & Carter, 2012) call for longitudinal studies, which are scarce in channel choice research. In contrast, several qualitative studies called for more quantitative studies that could be predictive, statistically testing results (Pieterse & van Dijk, 2007; van den Boer, Pieterse, van Dijk, & Arendsen, 2015). While a study by Carter, Weerakkody, Phillips, & Dwivedi (2016) doesn't focus specifically on channel choice, it's relevant because of its call for researchers to broaden their focus to include wider populations, additional countries, and additional factors such as the technological, economic, legal, political, and social.

5. Predominant Theories

5.1 Theories from Information and Communications Technologies

Pieterse & van Dijk (2007) is one of the studies cited most often by the other authors in this review and, while they don't develop their own theory of channel choice in citizen-government interactions, claiming a lack of previous research on channel choice determinants, they do collect some of the predominant theories and models from information and communication studies that are used in e-government studies. The most commonly cited in the articles discussed in these studies are Daft & Lengel's (1986) Media Richness Theory (MRT) which considers uncertainty and equivocality as well as information richness which they argue influences the difficulty of processing information (Pieterse & van Dijk, 2007; van den Boer, Pieterse, van Dijk, & Arendsen, 2015; van den Boer, Arendsen, & Pieterse, 2016; van den Boer, Pieterse, Arendsen, & van Dijk, 2017), Carlson & Zmud's (1999) Channel Expansion Theory (CET) regarding how experiences influence channel choice (Pieterse & van Dijk, 2007; Teerling & Pieterse, 2011; van den Boer, Pieterse, van Dijk, & Arendsen, 2015), Davis's (1989) Technology Acceptance Model (TAM) which examines the perceived usefulness and perceived ease of use of new communications technologies (Pieterse & van Dijk, 2007; Nam, 2014; Carter, Weerakkody, Phillips, & Dwivedi, 2016) and Fulk's (1993) Social Influence Model (SIM) regarding social influences on communications technology use (Pieterse & van Dijk, 2007; van den Boer, Pieterse, van Dijk, & Arendsen, 2015).

5.2 Channel Choice-Specific Theories

Teerling & Pieterse's (2011) study on e-government use is one of the older channel choice-specific studies included here and, while it shows signs of being dated, it has been very influential on subsequent studies in this field with its proposed citizen multichannel behaviour model (figure 1), which begins with an individual's choice of channel leading to a discussion of how that person uses their chosen channel. After that, the individual evaluates their choice and usage, and this evaluation influences future channel choice. The choice of channel can be influenced by channel marketing.

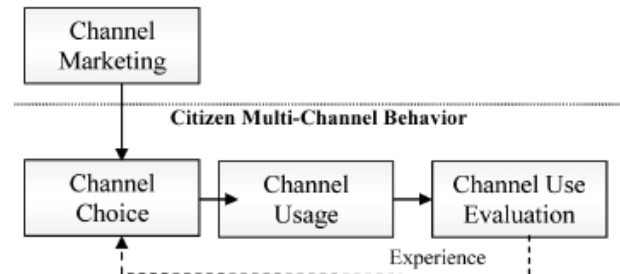


Figure 1 Teerling & Pieterse's (2011) Simplification of citizen multichannel behavior model

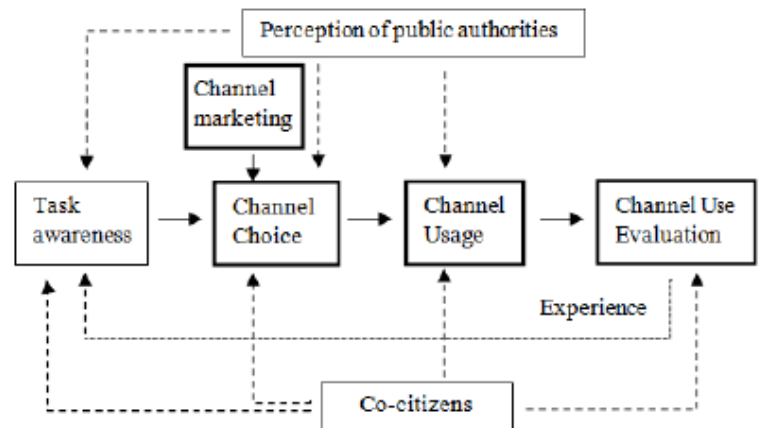


Figure 2 Madsen & Kraemmergaard (2016)'s Modification of citizen multichannel behavior model

Madsen & Kraemmergaard (2016) expand on Teerling & Pieterse's (2011) model, choosing it because it recognizes outside influence and treats channel choice like a process. However, Madsen & Kraemmergaard (2016) delve more deeply into how and how much external parties can influence channel choice, adding task awareness, or to what degree an individual knows why they need to do and how to do it, to the beginning of the process; perception of public authorities as an influencing factor on awareness, choice, and usage; and the influence of co-citizens at each step in the process, from task awareness through evaluation (figure 2).

van den Boer, Pieterse, Arendsen, & van Dijk (2017) cite Daft & Lengel's (1984) Media Richness Theory (MRT) and Byström & Järvelin's (1995) information seeking model among others, but they argue that most such models are one-dimensional and propose correcting this by developing an integrated model of channel and source choices, including processes and relationships (figure 3). They incorporate perceptions of source and channel characteristics, prior experiences, task characteristics, situational factors, social influences, perceived characteristic of the relationships with a source, and personal and organizational characteristics such as position in organization and organization size into their model. How future researchers may build on this promises to be interesting, but it may also be challenging because of the sheer number of variables under investigation. On one hand, this could lead to a more accurate and nuanced study, but on the other hand, it could become more difficult to determine which outcome correlates to which variable. Before either of those results can be seen, however, it would need to be re-examined for two reasons, first, because their model didn't fit all their data and, second, because it's specific to business-government relationships. These difficulties may not be surprising given that this may be the first attempt at a channel choice model of this magnitude.

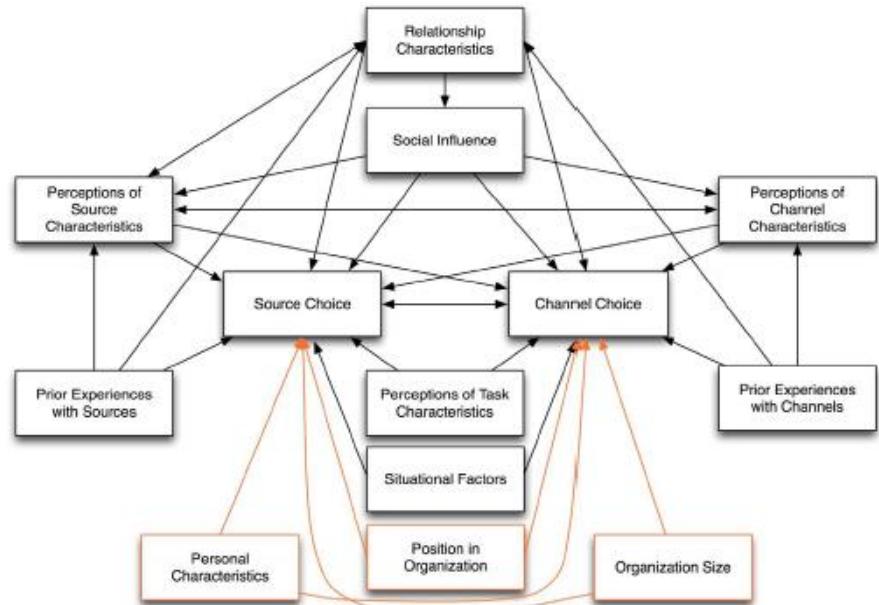


Figure 3 van den Boer, Pieterse, Arendsen, & van Dijk (2017)'s proposed integrated model of channel and source choice processes and relationships

6. Areas for Future Research and Limitations

6.1 Under-researched Factors: Social Influence, Marketing, Irrational Factors, & New Digital Media

Based on the above information, social influence is a significant but under-researched factor, which channel researchers have only recently begun to examine closely (van den Boer, Pieterse, Arendsen, & van Dijk, 2017) despite Pieterse & van Dijk (2007) and van den Boer, Pieterse, van Dijk, & Arendsen (2015) referencing the Social Influence Model, Reddick & Turner (2012) calling for more research on how social norms affect the digital divide and social media use, and Ebbens, Jansen, & van Deursen (2016) recommending that social digital skills be examined.

Other under-researched factors that may influence channel choice are marketing and irrational factors. Pieterse & van Dijk (2007) consider marketing research but Teerling & Pieterse (2011) are the only researchers I found to consider the impact of marketing tools on channel choice, though Madsen & Kraemmergaard (2016) mention that it has been shown to be influential. Similarly, Ebbens, Jansen, Pieterse, & van de Wijngaert (2016) are the only researchers I have found to discuss irrational factors on channel choice, but their research on the subject is flawed since they don't explicitly define or examine any irrational factors; if they considered some of the factors they examine to be irrational, they didn't explain how. That said, this is

certainly an area worth studying since most researchers in this area seem to assume the people they study make rational choices about their government-contact needs and this may not always be the case.

Many researchers recommend focusing on new digital media while studying channel choice specifically and citizen-government interactions generally, but few have done so (Reddick & Turner, 2012; Bimber and Copeland, 2013; Reddick & Anthopoulos, 2014; Zuiderwijk, Janssen, & Dwivedi, 2015). van den Boer, Arendsen, & Pieterse (2016) include some new digital media options on their list of channels to choose from, but this is not the focus of their study. Bimber and Copeland's (2013) paper claims to study new digital media, but its primary focus is on Internet use and outcomes, and new digital media remains under-researched in the channel choice field. However, as Bertot, Jaeger, & Grimes (2012) note, there has been significant research regarding new digital media, including social media, in the broader e-government field.

6.2 The Third-Level Digital Divide: A Gap in Outcomes

While Scheerder, van Deursen, & van Dijk (2017) examine the digital divide, they don't do so with a focus on channel choice, which is a perspective that could add considerable value to citizen-government interaction research in the West. Furthermore, though their study focused on demographic and economic factors, they recommend including social and cultural factors in future research. In their examination of the role of libraries in citizen-government interactions in the U.S., Bertot, Jaeger, et al (2013) focus on first level digital divide whereas Reddick & Turner (2012) thought the nature of the divide was changing in Canada and Scheerder, van Deursen, & van Dijk (2017) examined the third-level digital divide in developed countries. It could be simply that the digital divide is at a different level in different countries, despite certain economic and technological similarities.

6.3 Discrepancies in Findings Over Time

More longitudinal studies may help confirm the effectiveness of certain choices over time, because there are some discrepancies in results of comparable studies over the years, which could be due to slight differences in models and methods, especially if the differences in results are also slight (Teerling & Pieterse, 2011; Bimber & Copeland, 2013). Bimber & Copeland (2013) offered several other possible explanations including that differences in information and communication technology (ICT) availability and adoption over time may also vary considerably and that political intent could influence digital media use.

6.4 Limitations of this Literature Review

Aside from the limitations of time and place discussed in the introduction, I have focused primarily on channel choice. While those sources over the last five to ten years are thoroughly examined, the other citizen-government interactions that I begin to discuss are not covered in detail. I narrowed my focus down to channel choice and then broadened it again slightly to highlight some of the factors that have not been studied channel choice-specific research. However, it would take a very long time and a much longer review to cover all the studies that have been done in the broader area of citizen-government online interactions.

7. Conclusion: Proposed Research Problem Statement

In conclusion, I suggest investigating channel choice regarding a possible online chat option for Canadian e-government services. Telecommunications companies such as Telus regularly use such a chat program which allows them to nearly immediately and synchronously interact with customers as well as keep an instant written record of the transaction followed by an optional survey of the customer's opinion of the interaction (Telus, n.d.). Such relatively new digital media technologies have been neither used nor researched often by channel choice researchers or by governments, but knowing more about them, about what would influence someone to choose them and how effectively they use them once chosen, could assist citizens in acquiring the government services they need and governments in distributing information to those citizens. Libraries may be able to help with this connection (Taylor, Jaeger, et al, 2014) or be the "warm experts" that Madsen, & Kræmmergaard (2016) suggest citizens trust.

The most interesting and possibly the most productive method for examining this might to beta test an online chat service with a government website which would allow researchers to observe e-government use in a

sample population of people who may choose to use the chat feature rather than other already available options. In-person, rather than exclusively online, observation of e-government use would be challenging, but perhaps could be done by involving libraries where people might choose to access e-government through an online chat, and furthermore, although difficult, it would be valuable because most of the methods used above document what participants say they do which may differ from what they actually do (Wildemuth, 2017). The government contacts and coordination that would be required for this study would probably be the most complicated to acquire, but if that and suitable funding were achieved, it's likely that a public library could be found that would be interested in participating. If this chat option was followed by a survey, the convergent mixed methods may help explain contradictory findings that may arise during an exploratory study; it is also a pragmatic approach suitable for e-government practice (Creswell, 2014).

Based on the work of Madsen & Kraemmergaard (2016) and Teerling & Pieterse (2011), social influence and marketing would be examined regarding what influences someone's decision to try this channel as well as in assessing their proficiency in its use. This last factor would essentially be an analysis of the third-level digital divide, or the difficulty some people who have internet access and some skill still have in achieving a successful outcome (Scheerder, van Deursen, & van Dijk, 2017). An additional perspective under examination would be the process, from the time someone realizes they need something from the government to their evaluation of the interaction. This last could probably best be assessed through survey questions, as has been done before. Irrational factors would certainly be worth studying but since I haven't defined them and am, as yet, unsure of how to approach them, I will leave them out of the question.

I would propose further adapting Madsen & Kraemmergaard (2016)'s modification of citizen multichannel behavior model by including some of the factors chosen by van den Boer, Pieterse, Arendsen, & van Dijk (2017) in their integrated model of channel and source choice processes and relationships; these factors are perceptions of source characteristics, perceptions of channel characteristics, prior experiences as part of the evaluative processes, and source choice. I further propose including marketing as part of the evaluative processes, both before and after a channel or source choice.

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