ON THE ROLE OF TECHNOLOGY IN POLITICAL COMMUNICATION RESEARCH

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Abstract

This article reviews multi-disciplinary body of research to develop a model of how technology impacts communication processes at various stages. The model, which includes psychological and technological factors, is argued to represent a more useful framework for political communication-effects theory building than frameworks offered by either social constructivist or technological determinism perspectives. The article also argues for a greater inclusion of technology into existing political communication t heorising. Several future research directions further developing this argument are described.

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Today's Information Era

In this article, several disjointed theoretical domains are synthesised to make an argument for paying a greater attention to information communication technology (ICT) as a significant contributor to numerous effects in the context of political communication. There appears to be a regrettable lack of attention to technology in much of today's political communication-effects theorising (see Bennett and Iyengar 2008 for a similar argument), possibly stemming from the researchers' desire to distance themselves from technological determinism. Many of today's researchers following social constructivist perspective on technology, appear to have little interest in understanding the nature and effects of ICTs, in part because of their belief "that the consequences or effects or "impacts" of technological change have already been studied to death by earlier generations" (Winner 1993, 368). The present work does not attempt to support technological determinism or dispute social constructivism. The argument advanced in this work is not to abandon social, psychological, political, economic or other factors when attempting to describe political implications of ICTs. Instead, this article proposes that one needs not be a technological determinist to properly appreciate the role of ICTs and to pursue fruitful research directions that coherently integrate psychological, sociological, and technological factors.

To simplify the historical discussion below, United States was chosen as a geographic context. However, many of the points presented below apply to other contexts, as well. Cross-national comparisons, although very informative, are not directly related to the main goals of the present work.

Although several authors described revolutions or eras in transformation of ICTs (see Rogers 1986 and Fang 1997), Bimber's (2003) discussion is the most relevant to the present work due to its heavy focus on the role of ICTs in a democracy. Bimber suggested that the U.S. has gone through four information revolutions. Prior to the 1820s there was no mass transmission of information and public affairs information was in short supply. The first revolution (1820s-1830s) happened as a result of the creation of the massive postal system that stimulated the information transmission. The number of newspapers exploded from 200 in 1800s to 1,200 by 1833 (Bimber 2003, p. 53), and so did their circulations. Invention of telegraph in 1842 further expedited the flow of information. The second revolution (1880s-1910s), marked by the explosion in the number of businesses and associations, brought about a substantial diversification and specialisation of the news content. The third revolution (1950s-1970s) was marked by the development and popularisation of the broadcast media (i.e., television). The broadcast channels allowed for a truly "centralised" mass communication and the audience consumed relatively homogenous content until about 1990s – the start of the fourth revolution.

The fourth revolution (1990s-present) ushered an era of information intensiveness characterised by (1) a multiplication of low-cost information distribution channels; (2) a technological capacity to cheaply acquire highly detailed information; (3) facilitation of direct inter-citizen communication; (4) ability of anyone to (re)distribute information globally; and (5) ability to archive, store, and retrieve highly voluminous information (Bimber 2003). What is particularly notable is that the today's information era[1] is drastically different from the time when the me-

dia-effects research tradition originated. The Internet, an inherently decentralised technology, transferred substantial control over the information to the end-user (in terms of what kind, when, and how users consume information), allowed average Internet users to become content producers contributing to a great content variety (e.g., blogging, online video sharing, see Dylko et al. 2012), and also spawned a huge diversity of media and communication channel types (Chaffee and Metzger 2001; Prior 2007), as well as ways of using them (e.g., online news aggregation sites, social-networking sites, discussion forums, Twitter, podcasts, etc.). Over the last 30 years we have moved from face-to-face, print, radio, and broadcast forms of communication to a numerous mass/interpersonal hybrids of all four.

The structural features of today's popular media forms are much more sophisticated, adjustable, and quickly-evolving than ever before. For example, ability to customise the information flow, subscribe to the RSS feeds, "hyper-" selectively expose oneself to agreeing views, interact with others, produce content, and utilise rich archived multimedia data are common structural features of such media outlets as Yahoo, Facebook, Google+, or YouTube, among many others. Given such increased variety of media and potentially numerous ways of using these media, it is important to develop an appropriate framework for examining the political implications of today's ICTs. This article focuses on the role of ICTs in producing micro-level effects in political communication context. This work also proposes that political communication theorists should include ICTs into more communication models (Bennett and Iyengar 2008), and generally be more mindful of the role ICTs can play in contributing to effects on the micro level.

General Framework for Understanding the Role of ICTs

It might appear that this work adopts technological deterministic view. Technological determinism is commonly defined as a perspective that (a) treats technology as developing according to some inherent and inevitable logic, and that (b) considers such development as the major causal factor producing various social, political, economic and other important effects (Bimber 1990; Leonardi 2009). This sweeping and simplistic view is rejected in this work. Social constructivism view arose in opposition to technological determinism, and it suggests that there is no internal technology-development logic, and instead, there are series of choices technology designers take to actively shape the technology (Williams and Edge 1996). These choices are flexible and susceptible to influence from technology users, from broader cultural norms, from social interactions of various important actors, from economic factors, and so forth. These choices, rather than technology itself, are viewed as significantly more important to understand if one wants is to develop an accurate perspective on history of societies. This view also appears inadequate for a comprehensive evaluation of technology's role.

In context of the present discussion on the individual-level communication effects, this article advances a position located between technological determinism and social constructivism. Although the major conceptual focus in this article is on ICTs, the present work is not favouring one perspective over another. The role of the structural features of a communication channel is conceptualised to be important (but far from determinative) to the manner in which the channel is used, and thus, to the effects such usage can produce. The "ICT-relevance" claim

advanced in this article is drastically different from the technological determinism view, which negates the role of social factors, or at least considers technology to be far more important than anything else when explaining or predicting individual- or societal-level effects. In this article, the role of technology is viewed as a context-dependent empirical question, rather than an assumed certainty. This article relies heavily on the social constructivist and structuration theorising from the organisational communication research (Fulk and Boyd 1991; Fulk 1993; DeSanctis and Poole 1994) and, by so doing, illuminates when and how technology and social factors work together to influence such outcomes as communication channel choice, information processing strategies, political discussion, knowledge, and participation. Conceptually, the present work views ICTs and human/social factors as independent variables, moderators, and mediators, all equally important and all capable of producing important effects.

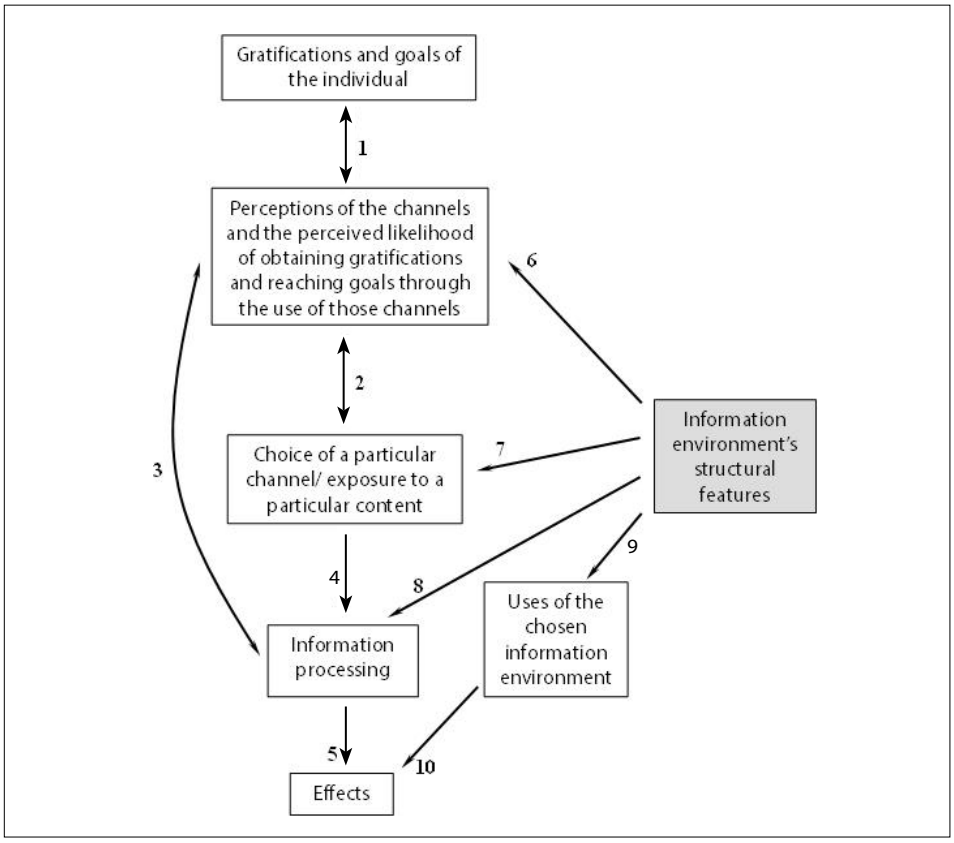
Review of technology history also suggests that both technological and human/social factors are equally important. In contrast to technological determinism perspective, there appears to be a reciprocally-causal relationship between human behaviour and social condition, on the one hand, and ICTs on the other, with ICTs sometimes shaping human behaviour and social changes and at other times being shaped by both (Fang 1997, 2008; Niederer and van Dijck 2010). Fang offered an illustration of this relationship by arguing that "Printing spread literacy. Literacy spread printing. Together they changed the world" (Fang 1997, 32).

Finally, the view of technology adopted in this work is structurally similar to James Fishkin's (1997) description of the role of "institutional design" in the context of the deliberative democracy framework. Fishkin views institutional design as a tool to overcome human beings' cognitive and psychological shortcomings, and he considers institutional design as highly important facilitator of the "right" type of deliberation among citizens. Fishkin recognises that such institutional design, to be the most effective, should incorporate a thorough understanding of the social and psychological nature of individuals. However, the design (e.g., moderation of deliberative discussions and presence of opposing expert opinions) can encourage desirable social and psychological processes (e.g., promote equality in deliberative discussions and maximise exposure to and understanding of opposing arguments on an issue), while minimising undesirable social and psychological processes (e.g., reducing domination of discussion by individuals of higher socio-economic status and reducing selective exposure to attitude-congruent information). Similarly, in the present work, technology is treated as structures that can hinder or facilitate various social and psychological processes, producing indirect and sometimes direct effects on important political communication outcomes.

Specific Role of Technology in Political Context: Functional Model of ICTs

To understand what structural features, under what circumstances, and why might matter to political communication theorists, Functional Model of Communication Technology is proposed below (see Figure 1).

Figure 1: Functional Model of Communication Technology



This model by no means sufficiently addresses *all* of the complexities and intricacies of the human communication process and the role of ICTs in it. Depicting a comprehensive picture of the human communication process with a single model is practically impossible, since all models are "inevitably incomplete" (McQuail and Windahl 1993, 3) simplifications of reality. The model's major theoretical contribution is in synthesising various established research findings from several disjointed fields to paint a coherent picture of the role ICTs play in producing political communication effects.

The model is focused on describing the role of ICTs. Conceptual focus is on examining ICTs as an independent variable. Therefore, the unidirectional arrows going from ICTs (or information environment's structural features) should not be understood as arguments in favour of technological determinism. ICTs are clearly influenced by society and individuals (Williams and Edge 1996). Examining ICTs as a dependent variable and examining factors that have an effect on ICTs is a valuable line of inquiry, but it is beyond the scope of the present work.

The central concept in the model, titled "Information environment's structural features," needs elaboration. The information environment is conceptualised to be an environment or a milieu that individuals submerge themselves into to obtain information. For example, a print newspaper is one information environment,

while Facebook is another, and synchronous interpersonal computer-mediated discussion is yet another.

To explain the relationships proposed in the model above, several communication effects and interpersonal computer-mediated communication (CMC) theoretical orientations, as well as findings from various other domains, are reviewed next.

Uses and Gratification and Expectancy-Value Theory.

Several factors influence one's likelihood of exposure to a particular medium. Besides user's motivations and goals (illustrated by arrow "1"), channel's perceptions are important. Users will be better served by selecting those media that users perceive as being the most effective at meeting their needs. Such is the prediction made by expectancy-value theory (Rayburn and Palmgreen 1984), and such relationship is represented by arrow "2." It is argued in this article, that one of the important factors differentiating television from newspaper and CMC from face-to-face communication are the structural features of each. In the television-newspaper example, some of the relevant structural features of television are: exposure to television does not require much physical effort (Krugman 1965; Scheufele 2002) and individual can engage in other acts at the same time. In contrast, exposure to newspaper requires one to hold and leaf through the pages, one has to be more active, and the range of acts that an individual can simultaneously engage in is more restricted. All of these characteristics stem from physical characteristics of each medium. Such impact of structural features on the perception of a medium or channel is illustrated by arrow "6."

Expectancy-value theory proposes that exposure to media content has a reciprocally causal relationship with the perception of the media (Rayburn and Palmgreen 1984), as indicated by the arrow "2." Perception of media can also influence what gratifications an individual might be seeking and what goal she might be trying to achieve in the first place, as suggested by expectancy-value and adaptive structuration theory (DeSanctis and Poole 1994) and depicted by the arrow "1." Adaptive structuration theory suggests that a particular medium's utilisation is highly interdependent with its users, where user's interaction with the medium is one of the factors determining how the medium is ultimately utilised (Fulk and Boyd 1991; DeSanctis and Poole 1994).

Additionally, as suggested by the media richness theory (Daft and Lengel 1986), structural features of an information environment should shape the perceptions of the channels and lead to utilisation of different channels and, as a result, exposure to different media content, as illustrated by arrows "6" and "7." Media richness theory suggests that users are rational and realise that they would be better served and, therefore, should opt for using those types of media that fit the informational task the best (Daft and Lengel 1986; Trevino, Lengel and Daft 1987; Webster and Trevino 1995). Complex communication tasks will be handled better by relying on "richer" channels (i.e., face-to-face conversation), while simple ones by relying on "leaner" channels (i.e., email).

Information Processing Strategies

Different communication channels and different types of media content encourage different types of information processing. Kosicki and McLeod (1990) describe

three primary strategies: (1) Selective scanning, defined as "a reader or viewer's response to the volume of mediated information and the limited time and energy available for using media. This strategy involves tuning out items that are not of interest or use to the audience member" (75-76). (2) Active processing, defined as "audience member's attempt to make sense of the story, going beyond the exact information given to interpret the information according to his or her needs. This strategy captures the person's need to "figure out" the story (75-76). (3) Elaboration, defined as actively connecting news story content to one's past experiences in order to contextualise and deeply process the information.

The perception of a medium shapes what information processing strategy will be employed by the user. Salomon (1984) found that the perceived difficulty of processing information from a particular channel (TV vs. newspaper) affects how much individuals actually try to deeply process information from those channels. Also, persuasion research showed that modality of communication (print vs. video) can influence how deeply the message is processed (Chaiken and Eagly 1976). Such influence of information channel on information processing is illustrated by arrows "3" and "4." This suggests that the structural features of various information environments (e.g., mediated vs. interpersonal discussions; *The Economist* vs. *MTV's Punked*) and perceptions of such environments might lead to different information processing strategies. Elaboration on arrow "8" is offered in the next section.

After being exposed to content and after processing such content, individual might reappraise the perceived usefulness of the channel for his/her particular goals or gratifications, as suggested by the expectancy-value (Rayburn and Palmgreen 1984) and adaptive structuration theories (DeSanctis and Poole 1994) and illustrated by arrow "3." If the channel proved to be adequate, it will likely be used again for similar goals or gratifications. Exposure to political information and subsequent processing of such information is bound to produce some individual-level "effects," as numerous research traditions (e.g., persuasion, framing, priming, agenda-setting, cultivation, political learning, political participation) have established, and as represented by the arrow "5." The significance of the information processing strategies is demonstrated by their relationship to such normatively important outcomes as political and current events learning and political and civic participation. Eveland (2005) suggests that there is evidence of a positive relationship between elaboration and political knowledge and participation, and a negative relationship between selective scanning and political knowledge and participation. Ability of information processing to produce various effects is represented by arrow "5."

Finally, the previously mentioned media richness theory suggests that users are better served and, therefore, often opt for using channels that fit the informational task the best (Daft and Lengel 1986; Trevino, Lengel and Daft 1987; Webster and Trevino 1995). Similarly, specific information environments are better suited for specific uses because the environments' structural features make them more/less effective for various uses. Research on how different levels of discussion moderation impacts the users' behaviour on online discussion forums indicates that information environment's structural features impact on how the environment is used (Wright and Street 2007). Such impact is illustrated by arrow "9."

It is widely recognised by communication-effects researchers that different uses of information environment should lead to different effects. Valenzuela, Park

and Kee (2009) showed that using Facebook in general does not predict political participation, while using Facebook groups does. Also, Shah, Kwak and Holbert (2001) showed that social capital increases if one is using the Internet for informational purposes, and decreases if one is using the Internet for entertainment. Such impact of different uses of information environment is illustrated by arrow "10."

Theoretical Relevance of ICTs

The model described above outlines several basic processes by which ICTs can produce various direct and mediated effects. This section elaborates on how such basic processes extend and refine existing political communication theorising. Several novel and testable propositions are detailed below connecting today's ICTs to existing research.

Political Learning

Systematic efforts to understand the antecedents of political learning represent a well-established political communication research tradition (Kosicki and McLeod 1990; Delli Carpini and Keeter 1997; Tewksbury and Althaus 2000; Eveland, Seo and Marton 2002). This line of research might benefit from examining structural features of various information environments as the independent variables. Environments such as YouTube allowing for numerous ways to efficiently identify sought content might affect information acquisition differently versus information environments that are much less sophisticated in their internal content search capabilities.

Search efficiency seems to be one of the information environment's characteristics making it useful for such a task as identification and retrieval of highly specialised information, as illustrated by the arrow "7" (Dylko and McCluskey 2012). Efficient search might encourage individuals to be exposed to more information, and leave enough cognitive energy and motivation to deeply process and learn this information (Anderson and Reder 1979), which is illustrated by arrow "8." Additionally, efficiency of the information gathering is crucial to the likelihood of exposure to political content. If individuals perceive the task of information location to be insurmountable, they are not likely to want to invest their scarce resources (time, mental activity, etc.) expecting that there is a very low probability of any tangible return on the resource investment (Downs 1957). Thus, individuals are not expected to even begin trying to find any information, as the arrows "6" and "7" show. On the other hand, if individuals are aware of the efficient search capability and are confident that with some effort, they will be able to locate the information they want, they might be more likely to begin the search, and subsequently, will be more likely to be exposed to the sought political content.

Ability to comment, rate, edit articles, or other functionality allowing users to manipulate content on a Web site can also improve political learning (arrow "8") (Dylko and McCluskey 2012). Being an active content producer and consumer, which is facilitated by content manipulability, is likely to lead to the following process: When users of a Web site are allowed to create or modify the Web site's content, they may process the content more deeply, even without actually creating or modifying any content. Eveland (2004) described a phenomenon that he called "anticipatory elaboration" and Pingree (2007) examined a similar phenomenon that he called "expectation of expression," both of which refer to the effects of

one's expecting to engage in political conversation. When an individual anticipates that she will be discussing politics with politically-interested co-workers, friends, or family members, the individual tends to pay more attention to political news and deeply process that information. Both attention and deep processing increase political knowledge. Therefore, even the potential of political conversation (which is similar to a potential of creating or modifying political content on Web sites) should facilitate political learning. Although an interpersonal conversation with members of one's social circle and modification of content on a Web site are different behaviours (the former has a dimension of social peer pressure encouraging a person to learn about the topics her social circle is interested in, whereas the latter may not have that dimension), they are both characterised by an opportunity to express oneself and the need to formulate one's opinion prior to such expression. Thus, actual manipulation of content on a site, or even a potential of doing so in the future, might create a strong motivation to learn and think more about politics.

Finally, it is worth discussing how the level of *submersion* into the information environment, enabled by a set of structural features, might impact political learning. The submersion is the opposite of the accidental or unintentional exposure (Tewksbury, Weaver and Maddex 2000). For example, when a person is motivated to learn about the views of the French President François Hollande on Iran's nuclear program, that individual might choose among numerous information environments to obtain the relevant information. One choice might be a friend who is an expert in the foreign policy matters. The second possible choice might be the individual's local print newspaper. The third possible choice might be YouTube. If we focus just on these three information environments it could be argued that the individual will increase her knowledge about Hollande's views the most by utilising the third (YouTube) information environment. The reason for this is that the information environments like YouTube enable individuals to zero in on just the specific information that they are interested in and discourage exposure to irrelevant content. For example, if a person inputs keywords "Hollande's Iran nuclear program" into the YouTube search field, dozens of videos will be returned as a result of the search. Subsequently, the individual might choose one of them. Afterwards, the person is taken to a page which contains the video itself, along with a list of other videos related to the topic, such as videos detailing Hollande's plan of action in the upcoming U.N. hearing on Iran's nuclear program, his announcement of a new position on the issue between several European allies, Hollande's interview on the topic, and so forth. Information on the page conveniently offers only the videos relevant to Hollande's views on Iran's nuclear program. There is little (if any) sport, weather, celebrity, or any other distracting and irrelevant information present on the page. Our individual is thus capable of effectively extracting just the type of content she is interested in.

In contrast, if our individual chooses a local print newspaper, she might discover that there are no stories on either Hollande or Iran's nuclear program in that day's issue. Even if there are such stories, not only their focus is likely to be only partially relevant to the specific area that our individual is interested in, but more importantly, these stories would be surrounded by other unrelated articles, perhaps dealing with the local political scandal, or some famous criminal trial, or some other unrelated news of the day. In this type of the information environment

the individual (1) faces challenges identifying the proper content, and (2) is being distracted by the intrusively placed irrelevant information. Both factors lead to a decrease in focus/attention, decrease in motivation to deeply process the content (arrow "8"), and resulting diminution in the expected knowledge gain (arrow "5"). The above discussion demonstrates how such structural feature as the "submersion" might affect political learning, again pointing to the importance of the information environment used by the individual.

Political Participation

Evidence is substantial that political knowledge is a strong direct and indirect (through increases in efficacy) predictor of political participation (Kim, Wyatt and Katz 1999; McLeod, Scheufele and Moy 1999; Scheufele, Nisbet and Brossard 2003). Therefore, if the projections advanced above are confirmed, the described structural features (e.g., search efficiency, content manipulability, submersion) should exert some degree of positive impact on political participation via political knowledge.

However, influence of ICTs on political participation should be examined more thoroughly. Today more and more forms of political participation (i.e., donating, persuading how to vote, fundraising, organising, contacting) can be carried out online (Bimber 2001; Trippi 2005). Additionally, new forms of political participation have recently emerged due to the Internet-based technological architecture (e.g., embedding political candidate's videos on one's personal Web site; making a blog post about one's favourite politician; downloading and displaying pro-candidate imagery as one's desktop or a screensaver). Utilisation of various information environments, such as Facebook/Myspace, YouTube, or a text-only blog (all of which are themselves characterised by different mix of various structural features) allows for an effort-free involvement in the above-described activities, leading to greater aggregate levels of online political participation, as illustrated by arrows "9" and "10." However, it is also likely that these ICTs can increase the gap in participation of politically interested and technologically savvy individuals, on the one hand, and politically apathetic individuals with poor technological skills, on the other hand.

Additionally, various information environments have varying degrees of customisability, allowing users to modify their personal information environment by *systematically* and *automatically* excluding disliked sources and topics, and including the preferred sources and topics (Dylko and McCluskey 2012). High customisability allows individuals to place themselves into an attitude-congruent information environment. Substantial research into selective exposure shows that individuals *generally* consume more information that fundamentally agrees with their viewpoints and consume less information that disagrees with their viewpoints (Taber and Lodge 2006; Iyengar and Hahn 2009; Knobloch-Westerwick and Meng 2009). The customisability attribute can amplify such a tendency. Selective exposure strengthens one's existing views and reduces attitudinal ambivalence (arrow "4"), and strong political attitudes and lack of political attitudinal ambivalence facilitate political participation (Mutz 2002) (arrows "5" and "10").

Political Communication Theories

Customisability, the previously mentioned technological affordance, has implications for research on gatekeeping, agenda setting, and framing. Today, traditional

news organisations have substantially less gatekeeping power than in the past (Williams and Delli Carpini 2004). While traditional news organisations might still provide the bulk of information for audience consumption, the audience can create their own gatekeeping structures and let in only very limited information from traditional news sources, as illustrated by arrow "9" (Dylko et al. 2012). Thus, customisability can be viewed as a mechanism through which traditional news organisations lose their gatekeeping power (arrow "10"). Similarly, a greater control over what information to let in or filter out of one's information environment greatly diminishes media's ability to influence "what people should think about" (i.e., agenda-setting ability, see McCombs and Shaw 1972). The ability to conveniently select preferred issues and preferred sources of issues should greatly diminish the power of mainstream media to set the agenda for individuals. Likewise, the ability to conveniently select preferred sources and preferred perspectives on various issues should greatly diminish the power of mainstream media to frame the issues. Individuals can now choose sources that have certain perspectives from which the issues are framed. Consistently relying on sources that, just as consistently, favour specific frames (e.g., liberal vs. conservative), diminishes framing ability of the traditional news media.

Manipulability, another one of the previously mentioned technological affordances might have implications for spiral of silence research (Noelle-Neumann 1974). Individuals can express minority views without fear of socially isolating themselves when they express themselves openly in homogenous-opinion (safe, others agree with them) communities, or when they express themselves anonymously in homogenous-opinion (dangerous, others disagree with them) communities. A variety of available forms of opinion expression (e.g., rating a news article, posting a comment, engaging in an interactive exchange of ideas on a discussion forum) have different degrees of anonymity and might make opinion expression under virtually any conditions possible (arrow "9"). It might be also interesting to inquire into which of those forms of opinion expression are capable of exerting the greatest impact on opinion of others (arrow "10").

Conclusion

This article calls for a greater attention to increasingly complex and powerful ICTs. Similar calls were implicitly made by Eveland (2003) and Meyrowitz (1997). Eveland (2003) argued that we should adopt a "mix of attributes" approach to theorising about the media effects. The "medium theory" by Meyrowitz (1997) is primarily concerned with the question: "How do the particular characteristics of a medium make it physically, psychologically, and socially different from other media and from face-to-face interaction, regardless of the particular messages that are communicated through it?" (61). Both researchers acknowledge that ICTs play a role that is worth systematic study.

The call for a greater attention to ICTs made in this work, also echo's recommendation of Winner (1986) to "take technological artifacts seriously" (p. 21-22), while avoiding simplistic technological-deterministic thinking. An example might help clarify the merits of the proposed model, and contrast it with technological determinism and social constructivism. As was mentioned earlier, substantial research exists on political learning. A technological determinist might argue that easy

access to abundant political content available online will inevitably turn unwashed masses into enlightened citizens and prudent stewards of democracy. A social constructivist might counter that users who are motivated and are able to become politically informed will become informed, and that technology has no role in the process. The model introduced in this work suggests that if we want to thoroughly understand who and how gets politically informed, we should acknowledge both technological variables (e.g., degree of information abundance, access to information technology, available modes of information presentation) and human variables (e.g., motivation and ability to learn political information, motivation and ability to use needed computer hardware and software, level of media literacy, media use habits). By focusing on both groups of variables (and by ignoring the unproductive division between technological determinism and social constructivism) we will be able to achieve theoretical models with greater explanatory and predictive ability, and models that do not get obsolete with inevitable technological transformation.

The proposed Functional Model of Communication Technology demonstrates why it is useful to think about the characteristics of the technological environment within which communication occurs. Admittedly, the model does not capture the full complexity of human communication or sociology of technology. For example, variables explaining how technology is shaped and how technology evolves (e.g., power) are left out. This is done not out of sympathy towards technological determinism, but rather due to our narrow focus on micro-levels effects of technology. The model does contribute to the development of political communication theory by performing, in the McQuail and Windahl's (1993) terms, *organising* and *explanatory* functions. The model (1) orders and relates disjointed "systems to each other" and offers a representation "of wholes that we might not otherwise perceive," as well as (2) provides "in a simplified way information which would otherwise be complicated or ambiguous" (p. 2). The model shows complexity of the relationships among the ICTs and human factors, and describes ICTs' influence at various stages of the communication process, thus highlighting when and how ICTs can matter in individual-level political communication theorising.

It is argued that technology usability theorising, organisational CMC theorising, and traditional political communication effects theorising fit organically into a multi-disciplinary program of research that can help us gain a more comprehensive and nuanced understanding of the nature of the today's information era and its implications. Such theorising moves us away from the frequently unproductive debate between the proponents of the technological determinism and the proponents of social constructivism by describing a limited, but important, role socially-shaped technology plays in the complex multi-mediator process of producing effects. Such nuanced view of technology's role and such research integration is likely to result in (1) explication of more important independent variables for political communication research (e.g., structural features of information environment, Eveland 2003), (2) increase in the explanatory power of existing communication effects theorising, and (3) bringing today's communication theorising in line with today's increasingly diverse, elaborate, and pervasive ICTs.

Notes:

1. Throughout this article, the term *information era* refers to a broad socio-politico-technological environment. Such eras are viewed as varying across time, and following each of the information

revolutions described by Bimber (2003). *Technology* is a macro phenomenon originating in the development of knowledge within a society, which leads to development of machinery, tools, and other forms of hardware and software. *Information environment* is a particular information technology subsystem into which individuals can submerge themselves. For example, blogosphere is viewed as a unique information environment, so is the traditional broadcast system, and so is any particular social networking site. Information environment, medium, and channel are used interchangeably throughout this article. *Structural features* are micro characteristics of these information environments and are conceptually analogous to technological affordances, or to Eveland's (2003) media "attributes."

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