



Noise, bias, and expertise in political communication networks

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ARTICLE INFO

Keywords:

Communication networks
Persuasion
Expertise
Opinion leaders

ABSTRACT

A central focus in the study of social networks and politics centers on the dynamics of diffusion and persuasion, as well as the manner in which these processes are affected by expert “opinion leaders.” The role of experts is particularly important in communication processes characterized by noisy, biased information – processes in which people with variable levels of expertise and strength of preference select informants, as well as being influenced by them. We employ an experimental approach that addresses these problems at multiple levels of observation in a highly dynamic context – small groups of individuals communicating with one another in real time. The analysis shows that participants formulate candidate judgments that decay in time, but the decay occurs at a significantly lower rate among the better informed. Moreover, the better informed are less affected by socially communicated messages regarding the candidates. Hence the influence of experts is not only due to their powers of persuasion, but also to the durability of their own privately formulated opinions. Their role in the communication process is further heightened by the higher value placed by participants on expert opinion, which in turn exposes the recipient to a heterogeneous and hence potentially influential stream of information.

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Some individuals value political information as an end in itself (Fiorina, 1990), and hence the process of becoming informed generates intrinsic rewards, making the acquisition of information a self-reinforcing behavior. For others, the costs of information are so high that they swamp any benefit an individual might realistically expect to receive as a consequence of its acquisition (Wolfinger and Rosenstone, 1980; Downs, 1957). As a consequence, when left to their own devices, some individuals become politically expert while others remain politically naïve. In the spirit of Berelson et al. (1954) and Katz (1957), we should thus expect to see a division of labor in the communication of political information, with high cost individuals relying on others whose costs are minimal or even negative.

Complications arise because participants in the communication process are politically motivated, not only in their reasoning but also in their communication efforts (Kunda, 1999; Lodge and Taber, 2000). Hence socially communicated information is typically biased at its source, adding to the complexity of citizen decision making. Quite apart from these partisan biases, many of the underlying issues are imbedded in uncertainty, and even fully engaged individuals with shared political orientations might arrive at divergent political judgments. Thus individuals send and receive information that is not only noisy but also biased.

Within this context, Downs (1957) argues that an important way to minimize the costs of political participation is to obtain information on the cheap from other politically expert associates with shared political viewpoints. While this is a

seemingly efficient and reasonable strategy, its success is contingent on whether the supply of such informants is scarce or plentiful. In some contexts, the available informants might be either an expert with contrary preferences or someone with shared viewpoints who is bereft of useful information. In settings such as these, observational and experimental studies show that individuals often choose in favor of expertise (Ahn et al., 2010; Huckfeldt, 2001).

The resulting model of electorates – complex networks of interdependent actors with heterogeneous preferences and levels of expertise – raises a number of questions regarding the dynamics of becoming informed. How do individuals balance their own individually acquired information with information they receive from others? Do individuals evaluate new information in the context of old information (Lodge and Taber, 2000; Huckfeldt et al., 2004), or do they discard the old in favor of the new? Is the time-dependence of information and communication affected by individual expertise, by the reliance on socially mediated information, and/or by the heterogeneity of incoming information streams? What are the consequences of temporal dependence for the social diffusion of information?

We address these questions by constructing a small group experiment that implements variations in information costs across individuals, as well as making it possible for individuals to obtain information from one another. The experiment provides incentives for individuals to become informed, but these incentives must be assessed not only relative to information costs but also to the noise and bias attached to the information. Thus the subjects confront

challenges and dilemmas that parallel those faced by citizens in democratic politics.

1. Expertise, information costs, and interdependent citizens

Due to the individually variable costs of becoming informed, one might expect democratic politics to be driven by a cadre of self-appointed experts within the electorate – individuals for whom the problem of information costs are either greatly reduced, or for whom these costs do not apply. These experts are self-appointed because their roles are self-defined by their own interests and preferences in relationship to the value of political information. Having already paid the costs of becoming informed, the well informed are more likely to be politically engaged across a range of political activities, including the process of communicating their views to others (Huckfeldt and Mendez, 2008).

Such a view is premature for several reasons, and it runs the risk of exaggerating the net influence of single experts. First, the problem is not that experts are lacking in influence, but rather that many individuals receive multiple conflicting messages from experts with divergent viewpoints. Second, the recipients of messages are active participants in the communication process even when their supply of information is quite limited, and hence it becomes important to take into account the role of both the senders and recipients of information in the communication process. In particular, individual information processing strategies play a central role within communication networks, making it important to focus on the “nodes” as well as the “edges” – to address the role of individual recipients and communicators, as well the relationships that tie them to one another. This becomes particularly important relative to the value that recipients place on the information provided by alternative informants.

Downs' (1957) analysis assumes the importance of politically expert associates with compatible political orientations, but important problems relate to the identification and verification of an informant's expertise and trustworthiness (Boudreau, 2009; Lupia and McCubbins, 1998). Snowball surveys of naturally occurring communication networks show that individuals *do* communicate about politics more frequently with individuals whom they judge to be politically knowledgeable. Just as important, their perceptions of expertise among others are driven by the objectively verified expertise of potential informants. That is, they are typically quite accurate in recognizing the political preferences of those who are politically expert and engaged. These snowball surveys also show that the perceptions of expertise held by others, as well as the reported frequencies of political discussion, are only modestly affected by political agreement (Huckfeldt, 2001; Huckfeldt et al., 2000).

Moreover, when subjects in laboratory experiments are given the opportunity to obtain political information from other subjects, they place a greater emphasis on the expertise of other subjects rather than the presence of shared political preferences (Ahn et al., 2010). Similarly, in field experiments that address the natural formation of communication networks, both Lazer et al. (2010) and Levitan and Visser (2009) identify the minor role played by compatible political views in the formation of associational networks. In short, there is scant evidence to suggest that individuals effectively avoid any association with individuals holding preferences that are different from their own (see Huckfeldt and Sprague, 1995; Huckfeldt et al., 2004). Thus we turn to the role of the communication process itself to understand the manner in which noise and bias are filtered by the communication process within associational networks.

2. Memory constraints on the process of becoming informed

Time and the organization of human memory produce their own constraints on political communication and the process of becoming informed. Limitations on the capacity of working memory mean that individuals are continually storing and retrieving information in long-term memory, and information that is seldom retrieved becomes increasingly more difficult to recall. Time is certainly not the only factor affecting the accessibility of information from long term memory. Some information is more compelling (and hence retrievable) than others, both due to the inherent characteristics of the information, as well as to the correspondence between information characteristics and the cognitive map of the individual (Fazio, 1995; Berent and Krosnick, 1995). While time might play a potentially important and systematic role in the process, expectations diverge regarding the exact nature of the role, as well as the direction, of temporal effects.

First, as a counterfactual baseline, to the extent that individuals engage in memory based processing with infinitely accurate recall, the first piece of information obtained in reaching a judgment should be as important as the last piece of information. More realistically, to the extent that individuals engage in memory based processing with finite recall, we would expect a recency effect in which more recent information should have the greatest consequence.

Second, if the process of becoming informed is autoregressive (Huckfeldt et al., 2004), new information is processed in the context of old information. Hence, new information is less likely to be influential to the extent that it diverges from old information. In the context of memory decay, however, a persistent shift in the message being communicated ultimately swamps earlier signals in favor of more recent ones. In this way, an autoregressive process in the context of memory decay produces a complex moving average of messages, autoregressively upweighting earlier messages but simultaneously downweighting due to decay.

Finally, an on-line processing model employs an auto-regressive framework in which new information is judged in the context of old information (Lodge and Taber, 2000), but in this instance the effect of old information is summarized and consolidated in the form of a tally – an attitude or judgment that the individual brings to the interpretation of new information. When an individual receives new information in the on-line model, it is judged relative to prior judgments based on earlier information. In this case we see a primacy effect in which new information is less likely to be influential to the extent that (1) the pre-existent judgment is held more confidently and (2) the new information diverges from the old information. Here again, the primacy effect of earlier messages must compete with memory decay.

We rely on the early insights of McPhee et al.'s (1963) analysis in addressing the implications of social communication, political expertise, and memory decay for the political communication process. In his computer simulation, agents take information from sources in the environment, such as the media. They form prior judgments on the basis of that information and share their opinions with others. Based on these communications, they update these priors and communicate the information again. We pursue McPhee's contributions in the context of an experimental design and analysis that is inspired by a continuing stream of work in the study of social dilemmas.

3. The experimental design

Studies of political communication through social networks are beset by two related problems. First, social networks involve

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