



Modeling surveys effects in political competitions

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H I G H L I G H T S

- This paper shows that the effect of periodic public surveys on political opinions of a small community of voters reinforce the so-called “echo chambers”, i.e. accentuate the spontaneous clustering of voting intentions.
- The model shows that surveys can affect the final electoral result, up to the point to possibly revert elections.
- The model stress the role of strategies influencing voters: by knowing voting intentions at the beginning of the trial period and planning different survey scenarios, it is possible to infer the final distribution of votes within the community.

A R T I C L E I N F O

Article history:

Received 6 November 2017

Received in revised form 27 February 2018

Available online 13 March 2018

Keywords:

Opinion dynamics
Agent-based models
Elections
Surveys

A B S T R A C T

In this paper the impact of news media and surveys on electoral campaigns for political competitions is studied by means of an agent-based model, showing the dynamics of voters' opinions before elections. A small community of people, connected among them as a realistic social network, is exposed to the effects of periodic surveys, in order to analyze how the electoral consensus varies time, in several scenarios of a two-parties configuration. Results of performed simulations provide support to the idea that surveys and news may play a relevant role in driving political orientation.

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1. Introduction

The relation between the news media and the electoral competition has attracted growing attention in literature quite recently, as shown in [1]. The way in which the information is provided to the public may reflect a position with regard to parties or politicians. Thus, for example, [2] propose a measure of political orientation by locating different media outlets on the political spectrum on the basis of the similarity of the experts used by the media outlet and those cited by members of Congress. There exist a relevant number of studies reporting correlations between media usage and reported behavior, as those in Refs. [3–10], among others.

A more recent paper [11], compared the perception of the Iraq war between people who viewed Fox News and those who did not, in order to show that the habit to follow some informative channel can affect the perceptions of reported news. This raises a point, for people have the tendency to seek out information that agrees with their pre-existing views. Such a phenomenon, sometimes referred to as *confirmation bias*, has been firstly documented long time ago, in [12], then in [13] and, more recently, in [14]. Some theoretical work, on the hypothesis that individuals adapt their choices about media sources according to the similitude with their political perspective, has been also done by [15,16]. Cited evidence shows that a sort

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of perverse reinforcing mechanism operates without helping any improvement of knowledge and, instead, increasing the political discussion, as shown by [17,18].

Such a phenomenon lead the recent literature on social communication to investigate new methodologies, based on the concept of echo-chambers, in which a spontaneous clustering emerges among people, as the result of a self-reinforcing preferential attachment dynamics. This process has been validly replicated on the internet, where both the chances of contacts among people and the information sharing are increasingly relevant. Following the idea of “public sphere”, provided by [19] – i.e. the communicative environment in which it is possible to circulate ideas and information – some authors argue that the internet usage has boosted a passive people’s exposure to the political debate, as shown for example, in [20] and in [21]. Some other authors suggest, instead, that a selective mechanism operates for people surfing the web in a selective manner, according to their *a priori* political views. For example, as explained in [22], social networks may help in recognizing the political orientation on the basis of the shared contents. In this case, then, an active choice would operate in seeking the most appreciated information, as held for example, by [23–25]. This debate is not being put forward here: what matters, for our purposes, is the evidence that news media affect electoral participation of citizens, as shown by [26–31], among others.

The strict relationship between informative campaigns, surveys and news management on one side and the political orientation of the public on the other, operates thus similarly to advertising for consumption activities. There emerges the chance to finely tune it, by means of a series of stimuli induced to manage consensus. For example, it can be strategic to know to which extent news media can affect the chances of incumbent politicians to be elected again, or whether specific information provided can create competitive advantage for a type of politicians. The debate on both points is still open. Empirical evidence does not support unambiguously a direct or inverse causation effects, as shown in contributions by [32,33,29,28,31]. However, an increase in provided information (in terms of number of news media) is shown to reduce the advantage of incumbents and, thus, to increase both the turnover and the quality of politicians, as in [34]. This should also reduce the chance to cover corruption, even if [35] and [36] show the evidence that an increase in the supply of news media may lead to a negative effect on electoral participation due to a crowding-out effect on the existing ones.

A more delicate point, questioning whether provided information is often far from being objective, is shown by several authors, as [37–40]. More explicitly, [41] specifies that media lie about the news, by choosing what to say and what to hide (see [42]), by selecting the timing of the news diffusion (see [43]), by creating the context in which the information can implicitly suggest the desired reaction, apparently spontaneous (see [44]). In [45,46] the existence of a media bias, which descends from the way journalists gather information from their sources, is directly addressed. Such a dramatic result may derive from choices made by journalists themselves or their media owners, as explained, respectively, in [47] and in [42], but also from eternal pressures exerted on the media by politicians, as argued in [34], lobbies, as in [47,45,46,48], or advertisers, as in [49–51].

In particular, the relevance of the effect of the media bias was empirically studied in the paper of [52], who analyzed the consequences of the diffusion of Fox News in several US towns between 1996 and 2000 to show that between 3% and 8% of Fox News viewers were induced to vote Republican. Other examples of such a relevant branch of literature are, among others: [53] on the effects of US newspapers endorsement of presidential candidates on voter behavior; [54] on the variation in the reception of the sole Russian TV independent channel “NTV” to study the impact on the vote share of government and opposition parties; [55] on the evidence showing that the reception of nationalistic Serbian radios signal increases the vote share of extremist nationalistic parties in the neighboring Croatian region; [56] on the effects on public television news programs in Italy after the electoral victory of the coalition lead by Berlusconi in 2001.

The possibility to find some statistical regularities in the dynamics of the electoral campaigns, descending from a suitable management of news media is appealing for parties, but not only. The political orientation of voters should be free and self-determined. The possibility that external stimuli may play a hidden role is dangerous and should be carefully studied and eventually regulated for a conscious and responsible preservation of democratic mechanisms.

In this paper we propose a new opinion dynamics agent-based model, with the main motivation of showing whether, and to which extent, the informative signals can effectively play a role in political competitions among participating parties. In the last decades, several simple toy models of opinion dynamics, coming from statistical mechanics and based on simple rules of thumb about human behavior, have been proposed in the context of sociophysics and computational social science [57–61]. More recently, along this line, agent-based models have been also extensively adopted in order to investigate social emergent behavior and describe the implications of complex dynamics in several socio-economic phenomena as in Refs. [62–75], among many others. In this study, through both single and multi-event agent-based simulations, several scenarios will be analyzed in order to capture the influence of media bias on a small community. In particular, we will consider the effects of surveys – i.e. those statistical investigations, based on interviews, which reports the stated preference of a sample of voters during an electoral campaign.

The paper is organized as follows: in section two, the model is presented; section three contains simulation results and discussion; section four presents conclusive remarks.

2. The model

Consider a relatively small community of people during a time interval of several months before a political election. The test community is *exposed* to results of surveys, which report – through different media channels – the voting intentions of a much larger population. Our operative hypothesis is that our small community can only be influenced by the larger

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