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Exploring E-petitioning and media: The case of #BringBackOurGirls

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ABSTRACT

The Internet and Web 2.0 have created novel forms of collective action and political participation, the dynamics of which have attracted considerable scholarly attention. E-petitioning, a genre of technology-based collective action tools, makes it possible for members of the public to address government decision makers directly with their requests for policy-related action. In this paper we explore the effects of Twitter, other forms of online media, and television news broadcasts on the accumulation of signatures in e-petitioning. We analyze the case of “Bring Back Our Girls,” a Change.org petition initiated in spring 2014 following the abduction of 276 young female students from the Government Girls Secondary School in Chibok, Borno State, Nigeria by heavily armed members of the Boko Haram, an Islamic extremist group. The petition targeted government leaders around the world. We found evidence that tweets and certain forms of online media, together with cable news items, are related to the likelihood of individuals to sign an e-petition. The results provide evidence in support of a hybrid media system in which diverse forms of media behave with diverse logics and impacts in their effects on e-petitions.

1. Introduction

Since early in its diffusion, scholars have explored the way in which the Internet may support public political participation as it has been traditionally defined (Harrison & Falvey, 2001). Indeed, individuals now turn to the Internet as the “first port of call for information on almost any subject” (Margetts, 2009) creating a foundation for informed and directed political action. More recently, the social media affordances of Web 2.0 have been used to create novel forms of collective action and participation, which are now the subject of sustained scholarly attention. “Collective action” takes place when at least two or more individuals bring private interests and desired actions into the public sphere. This kind of activity has been made more accessible by new

forms of technology-based mobilization (Bimber, Flanagan, & Stohl, 2005).

The Internet has become a locus for spontaneous political action as well as more systematic and long-term mobilizations with a substantial online element. Facebook and Twitter as well as blogs and online discussion forums are just a few of the applications that enable massive numbers of people, strangers in many cases, to mobilize or participate online by calling attention to issues. Within the social media milieu, e-petitioning is a new form of collective action tool that makes it possible for members of the public to address government decision makers directly with their requests for action that address specific issues. Using platforms like We the People (<https://petitions.whitehouse.gov>) and Change.org, initiating petitions as well as signing them, is easy.

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Although [Change.org](#) is a privately owned company, the platform enables petitioners to “target” government leaders with their calls for action. Since it can be used to quickly, easily, and accessibly mobilize vast numbers of people, e-petitioning has been referred to as “Protest 2.0” ([Petray, 2011](#)). Individuals participate in political action online without having to be part of a larger organized effort, members of interest groups, or affiliated with groups with well defined political objectives. However, e-petitioning has the potential to create a sense of collective identity among loosely coupled advocacy groups across national boundaries ([Rolfe, 2005](#); [Strange, 2011](#)).

Indeed, such was the case with [Change.org](#)’s petition to “#Bring back our girls” which was initiated in spring of 2014. On Monday, April 14, 2014, 276 young female students from the Government Girls Secondary School in Chibok, Borno State, Nigeria were abducted by heavily armed men. It was later determined that the abductors were part of Boko Haram, an Islamic extremist group based in Northeastern Nigeria, whose name means “Western education is forbidden.” Shortly after the story broke, it was learned that the girls were to be sold as slaves into marriage.

Two weeks later, on May 1, 2014, Ify Elueze, a young Nigerian girl, created a petition on [Change.org](#) entitled “All World Leaders Bring Back Nigeria’s 200 Missing School Girls #BringBackOurGirls”. By May 7, 2014, one week after being created, the petition had registered over 250,000 signatures; ultimately the petition garnered 1,104,440 signatures from individuals in many countries around the world by its ending date of May 15, 2015, over a year later. The incident itself gained substantial global media attention when then First Lady of the U.S., Michelle Obama, raised public awareness through Twitter, by posting a photograph of herself holding a sign that read #BringBackOurGirls, thus sharing the twitter hashtag campaign with more than 3.9 million followers. [Fig. 1](#) displays Michelle Obama’s post of this picture on May 7, 2014. As is apparent, the First Lady’s post on that day was retweeted over 75,000 times.

Although e-petitions are now a ubiquitous form of online collective action, very little is known or understood about the processes by which they accumulate signatures to become successful and potentially efficacious in motivating responses from decision makers. In this paper, we inquire about the processes by which e-petitions accumulate signatures through the analysis of a case study that has relevance for nationally sponsored e-petitioning platforms. We begin by discussing e-petitioning in general and the relatively sparse research on this topic, and then draw on two prominent theories of agenda setting as the foundation for our analyses. *Policy agenda setting theory*, developed by public administration scholars, focuses on the conditions under which topics compete for attention and are acted upon by government decision makers. Policy agenda setting theory acknowledges the role of media in drawing public attention to and generating support for particular issues and moving

them to the forefront of decision makers’ priorities, but media have not been the subject of extensive treatment. On the other hand, *media agenda setting theory*, the product of communication scholars and subject of more than 400 studies by 2004 ([McCombs, 2004](#)), focuses on how policy domains come to be seen as important by the public. Traditionally, media agenda setting attributes the salience of issues for the public to the attention that mainstream newspaper and television producers devote to them. Recently, however, the dynamics of a new media world suggest that such traditional agenda setting processes have been upended. Scholars are now examining the ways in which online and social media, with content generated by individual users, may play a substantial role in establishing issue salience.

We examine the dynamics of [Change.org](#)’s “Bring back our girls” petition history by exploring the effects of online and social media, along with cable television news broadcasts, on signature accumulation over time. We look specifically at the effects of tweet generation as well as the effects of other media that cover the incident itself, as well as cover the petition campaign. Our overarching research question is: **To what extent are various forms of media related to signature accumulation in [Change.org](#)’s “#Bring back our girls” petition campaign?** In the following sections of the paper we discuss e-petitioning as a phenomenon and the theoretical bases for posing a series of questions inquiring about the way that diverse media may be related to e-petition signature accumulation. We then explain our data collection, research methods, and strategy for data analysis; present the results of our analyses; and finally discuss our findings and their limitations.

2. Electronic petitioning and signature accumulation

Electronic petitioning systems are new, but citizens’ rights to petition their governments have existed for hundreds of years. Dating back to the 13th century, the right to petition has long been a way for people to communicate with local, national, or parliamentary governments. Facilitated by advances in information and communication technologies (ICTs), e-petitioning now serves as a mechanism for citizens to participate in government policy-making process in the United States, as well as in Great Britain, Germany, Scotland, Australia, Norway, and others. Proprietary e-petitioning services such as [Change.org](#), Moveon, and many others offer private platforms with some unique features. [Change.org](#) prompts initiators to specify the target for a petition, such as governments at all levels, corporations, and virtually any entity that petitioners choose to address for action. Like other platforms, [Change.org](#) also prompts petition initiators to disseminate information about their petitions using social media such as Facebook and Twitter, and enables users to move seamlessly into these platforms to do so. Thus, if desired, a petition initiator or signer may immediately tweet information about this event to their followers, in an effort to encourage others to sign their petitions.

There have been few systematic efforts to track the extent or success of e-petitioning activity, but there is little doubt that signing e-petitions has become a popular political and social activity among Internet users. The 2013 Oxford Internet Institute (OII) Survey (the last OII survey to track e-petition signing) shows that signing digital petitions is a frequent activity in Great Britain, with Internet users within a variety of “internet cultures” signing petitions at rates ranging from 6 to 17% within the past year ([Dutton, Blank, & with Groselj, 2013](#)). According to more recent data collected by the Pew Research Center ([Wike, Fetterolf, & Parker, 2016](#)), 37% of U.S. respondents have signed an online petition; online petition signing varies in eight other countries sampled from a high of 18% in Italy, to 8% by respondents from Greece, Poland, and Kenya.

It is difficult to discern the extent of e-petitioning on proprietary platforms such as [Change.org](#), the relevant platform in this research. The most popular of all private petitioning platforms, [Change.org](#) has registered more than 265 million users, who sign more than an average of 1000 new petitions initiated daily (<https://www.change.org/press>). Success or “victory” is pre-defined by the user upon the creation of a



Fig. 1. Michelle Obama’s picture posted on twitter.

petition and is viewed in terms of concrete actions taken by the petition target to address the petitioner's request or meeting signature thresholds established by the petitioner. [Change.org](#) claims over 69,948 such "victories" in 196 countries ([Change.org, 2021](#)). [Change.org's](#) "victories" range across numerous contexts, government and other, and across a variety of actions. Our efforts to categorize 236 recent U.S. targeted petition "victories" indicate approximately 30% of them target requests to US government agencies at a variety of levels, not including petitions directed at law enforcement agencies or schools ([Dumas, Harrison, Hagen, & Zhao, 2017](#)).

At this time, we know little about the conditions under which e-petitions attract signatures. Some research has suggested that the ability of British petitions to meet their target signature thresholds is heavily determined by the rate of signature accumulation during the initial day of the petition's life ([Hale, Margetts, & Yasseri, 2013](#); [Yasseri, Hale, & Margetts, H., 2014](#)). However, a study of signature accumulation for successful petitions initiated on the Obama Administration's We the People website found that successful petitions received more signatures on their second day of existence, suggesting that petitions that achieved an initial burst of signatures, perhaps through an initial broadcast about it on the first day, may die out quickly. However, those that continue to attract signatures into the second day are "intrinsically viral" and thus continue to attract signatures because individuals are diffusing information about them ([Chan, Lai, Hooi, & Davies, 2017](#)), presumably through other media. [Margetts, John, Hale, and Yasseri \(2016\)](#) suggest that social information about other users' actions, such as tweeting about one's signature, trending petitions, or trending hashtags, make it possible for others to assess the popularity of issues and ideas, which can become the basis for "feedback loops or chain reactions that draw in more people, whose actions are in turn likely to influence others" (p. 74).

Signature accumulation is also related to certain linguistic and semantic aspects of the petition itself ([Hagen et al., 2016](#)), suggesting that the content of the petition itself has something to do with signature dynamics. This research, taken together, demonstrates that beyond the intrinsic popularity of an issue addressed by a petition, there are medium-related factors that contribute to petition popularity.

The foregoing suggests that tweets and other online media will be involved in stimulating the accumulation of e-petition signatures, especially given the platform affordances referenced earlier that prompt initiators or signers to tweet about their petition. However, we know of no research that has explored the relationships between petition signature accumulation and a broader selection of media. While researchers have focused on some of the dynamics of petition signature accumulation, comparatively little attention has been paid to the social processes that may underlie these dynamics. Petition signatures are a visible outcome of collective mobilization and thus provide one index of the popularity or success of a particular instance of collective action. Below we describe some of the political and media processes that may help to explain the growth of petition signatures.

3. Policy and media agenda setting

Although not all e-petitions address policy issues, many of them certainly do. The historic right of citizens to petition their governments may be the only option through which citizens can use their own words to make a request to decision makers about an issue or action of their choosing that is unmediated by pollsters, political party, traditional news media, or researchers. Although typically addressing policy making within national contexts, policy agenda setting theory describes processes by which public problems come to be noticed and addressed in the public sphere that may be similarly applied to international issues that attract world-wide interest.

3.1. Policy agenda setting

For some researchers, the policy making process is a set of stages through which problems are recognized, attract public concern, are addressed by potential solutions, and then fade from public attention ([Downs, 1972](#)). For others, the policy process is one in which a "policy window" fortuitously emerges from ongoing streams of problems, politics, and competing policies, which, when favorably aligned, make it possible to take action ([Kingdon, 1984](#)). In more recent work by [Baumgartner and Jones \(1993, 2002, 2009, 2015\)](#)), agenda setting theory depicts policy making processes from the perspective of complex adaptive systems; the processes are characterized by dynamic interaction within an environment encompassing both stability and change. Key to each of these conceptions is the recognition that policy actions arise in *both* ongoing stable cycles of decision making, as well as in response to unforeseen circumstances that satisfy compelling needs and public demand. Stable policy systems are marked by allegiance to the status quo, by the bounded rationalities of political actors, by the difficulties of marshaling change in political systems of checks and balances, and by institutional structures that limit access to the policy process and are characterized by powerful political and ideological understandings that resist alternative interpretations ([Baumgartner & Jones, 2009, 2015](#); [Jones & Baumgartner, 2005](#)). Long periods of stability and incremental change are induced by "negative" feedback ([Baumgartner & Jones, 1993](#)), enabling policy systems to operate at "equilibrium" until something happens in the environment. Equilibrium is interrupted by a "focusing event" that compels the attention of the excluded or the disinterested, unleashing new interests and alternative interpretations with the potential to undermine the status quo. This sequence of triggering event and subsequent attention functions as "positive" feedback, helping an issue to gain access to the political agenda, and potentially leading to major policy changes that disrupt or "punctuate" the equilibrium. But such events do not inevitably subvert policy monopolies, since access to the agenda does not guarantee major change ([True, Jones, & Baumgartner, 2007](#)). Challenging groups may be checked and countered by powerful institutional counter-mobilizing forces; such moves can function as "negative" feedback, which may reassert system equilibrium ([True, Jones & Baumgartner, 2007](#); [Baumgartner & Jones, 2009](#)).

The policy agenda thus reflects the attention paid to particular issues, which can be increased by "focusing events" that can "cause issues to shoot high onto the agenda in a short period" ([Baumgartner & Jones, 2009, p.10](#)). A focusing event "is sudden; relatively uncommon; can be reasonably defined as harmful or revealing the possibility of potentially greater future harms; has harms that are concentrated in a particular geographical area or community of interest; and that is known to policy makers and the public simultaneously..." ([Birkland, 1998, p. 54](#)). Issue advocates can frame focusing events as indicators of policy failure in an attempt to broaden and mobilize their audience and move their issue to the forefront of the political agenda. On the other hand, status quo groups may well respond with counter-mobilization in an effort to preserve their interests.

More recently, policy agenda setting theorists have considered how information affects the attention processes at the heart of the theory. Indeed, the idea of punctuated equilibrium has morphed into a more general theory of government information processing, since problem identification is fundamentally dependent on information flows ([Jones & Baumgartner, 2012](#)). However, policy makers are incapable of attending to all information; their processing is "disproportionate" tending generally toward stability and under-reaction until "a scandal or crisis erupts...and they scramble to address the issue" ([Jones & Baumgartner, 2012, p. 7](#)). In such processes, media can amplify and weight some information over others, prime audiences with certain interpretational predispositions at the expense of others, and contribute to positive and negative feedback cycles. Focusing events might trigger increased news coverage, which then further stimulates the attention of

the public and decision makers (Wolfe, Jones, & Baumgartner, 2013) in a complex positive feedback cycle. Advocates can take advantage of media priming by selecting news frames that suggest policy problems to the public or new attributes of a problem that can change the focus of decision makers. While several media dynamics are conceived in this work, there are few attempts to test them.

As Wolfe et al. (2013) note, contemporary policy agenda setting is fundamentally a theory about the “politics of attention and attention dynamics in a political system” largely influenced by media, which “plays a role in allocating attention” (p. 179). Media functions to amplify attention by increasing news coverage or by introducing or emphasizing compelling frames, particularly following focusing events, contributing positive feedback to policy systems. Media can also function as an “alternative venue” that is used by advocates to increase the salience of an issue (p. 182).

3.2. Media agenda setting

These are familiar dynamics for *media agenda setting* researchers. In its traditional form, media agenda setting has foregrounded the processes by which newspapers and television communicate the salience of particular topics to members of the public, who use such cues to organize their ranking of issue priorities. Using a list of the “most important” issues during periods of national elections, the earliest media agenda setting research compared the attention that newspapers and television devoted to covering these issues (as measured in column inches, frequency of articles, news story time, etc.) with a ranking in order of importance of the same issues compiled by survey respondents (McCombs, 2004). Cross-lagged correlations were used originally to index the extent to which media and the public’s ranked issue priorities overlapped. With high correlations, this research established the strength of this function of mass communication to “set” the agenda for topics of discourse in public life. However, acknowledging that correlational analyses could not establish causality, experimental and longitudinal studies have also contributed to the view that the media sets the public agenda as a straightforwardly causal process (McCombs, 2004; McCombs, Holbert, Kousis, & Wanta, 2011).

The multiplication of public news sources provided by the Internet and social media has raised questions about the extent to which newspapers and television could continue to set the public agenda. While early research has documented the continuing ability of traditional news sources to create issue salience for topics discussed in online bulletin board discussions, it is also apparent that the time lag for traditional media coverage and the creation of subsequent issue salience for the public, found in prior research to be 1–2 months, was now reduced to approximately one week (Roberts, Wanta, & Dzwo, 2002).

More interesting questions related to online agenda setting, as Sayre, Bode, Shah, Wilcox, and Shah (2010) put it, focus on whether the Internet simply adds more channels to traditional agenda processes multiplying the effects of traditional media, or if online media and social media channels and dynamics might “reverse” such effects. This would mean online media essentially cue traditional media to cover the issues and attributes in discourse that appear online, either in online news media reporting or in the postings of social media “producers” (Bruns, 2009). The latter represents a fundamental change in traditional media processes, since both media and policy agenda setting scholars agree that traditional media favors the topics, information, and interpretations of government officials (Bennett, 2005; McCombs, 2014; Wolfe et al., 2013), while ignoring other voices. Reverse agenda setting would suggest the possibility of altering the ratio of government voices to other less powerful voices in media in ways now beginning to be explored.

3.3. Transitioning to a hybrid system

The net effect of initial studies of online agenda setting depict a media system in considerable transition. Tran’s (2014) review of 26

communication studies between 2002 and 2014 found evidence that major online news sites, such as MSNBC and Yahoo News, are affected by and in turn affect the agendas of legacy media such as newspapers and network television. Similarly, the mainstream media drive the content of political blogs, but at times blogs also set the agenda of traditional media. Increasingly such studies use time series analysis with Granger causality to probe the effects of online media content and causal directions.

Scholars are now attempting to identify conditions that may account for varying effects. For example, Sayre et al.’s (2010) investigation of the extent to which YouTube videos preceded or followed traditional news media in covering specifics of California’s Proposition 8 story suggests that agenda setting may be affected by precipitating events in the environment. Using time series analysis and Granger causality tests, they found that before the election (through which Proposition 8 became law), mainstream California newspaper coverage predicted news coverage in a variety of news outlets indexed in Google news (online news sources) together with the production of YouTube videos addressing the topic. However, after the election, as the California Supreme Court prepared to rule on the constitutionality of Proposition 8, the increased production of YouTube videos addressing Proposition 8 predicted news coverage in both mainstream California newspapers as well as online news sources. The authors speculate that YouTube video production increased in order to express viewpoints that were not being represented in the mainstream press.

Differences in agenda setting effects between traditional and online media may also vary on the basis of issue. This was amply illustrated by Neuman, Guggenheim, Jang, and Bae (2014) who compared one year of traditional media issue coverage to social media discussions (discussion boards, tweets, blogs) over 29 issue topics, using time series analysis and Granger causality tests. They found a variety of media dynamics operating simultaneously; for 18 of 29 issues, social media “Granger-caused” (see explanation later in text) higher levels of attention in traditional media, while for 11 of the 29 cases, traditional media Granger-caused social media attention. Six cases revealed reciprocal Granger causation.

Finally, online agenda setting effects may vary on the basis of social media characteristics. Jungherr (2014) has argued that Twitter is used in ways that differ substantially from other media: while users often tweet news stories from mainstream media suggesting traditional agenda setting effects, Twitter use is also characterized by special dynamics and logics that stem from users’ motivations to inform, mobilize, and cultivate media attention for their topics. Thus Twitter’s idiosyncratic logic supports Chadwick’s (2013) description of the “hybrid media system,” which is comprised simultaneously of new and old media, relatively speaking, each with idiosyncratic media logics defined by their “technologies, genres, norms, behaviors, and organizational forms.” Chadwick (2013) suggests that media researchers explore how the logics of newer and older media practices interact with each other, identifying distinctive differences between older and newer media, and noting where older distinctions may be disappearing. Such tasks are particularly important at this time of transition brought on by the diffusion of digital media. We were particularly interested in exploring and understanding the differences in dynamics and logic between Twitter, television, and online media that represents traditionally static news information, and dynamic online media that represents the temporal voices expressed in blogs, discussions, and other forms of social media.

Drawing upon this suggestion, we explored the use of Twitter, televised news broadcasts, and two different forms of online media as they affected the popularity of one particular e-petition. The specific target was a Change.org petition created on May 1, 2014 by Ify Elueze, a young Nigerian woman, entitled “All World Leaders: Bring Back Nigerian’s 200 Missing School Girls #BringBackOurGirls” (BBOG) exploring the relationships between signature accumulation over time and a variety of new and older media forms that appeared during the same period of time. We distinguished between tweets, television, and other forms of online media, and, regarding the latter, we also distinguished between

static news-oriented online media (including online mainstream news sites, other news sites, magazine sources, and websites) and dynamic social media (including blogs and other social media platforms such as Pinterest, YouTube, and discussion forums). Given the exploratory nature of this research, we posed the following first two research questions:

RQ1: What is the relationship between tweets related to the BBOG petition over time and signature accumulation over time?

RQ2: What is the relationship between static online media and dynamic social media over time and signature accumulation?

We also sought to understand the impact of two additional factors: (a) online and social media produced by individuals or organizations with a special interest in African or Black news or social issues and (b) whether or not online media items specifically mentioned the BBOG petition. We inquired whether online items with these characteristics affected the numbers of accumulating signatures. Thus, we asked:

RQ3: What is the relationship between online media showing evidence of special interest in African/Black social issues, and online media specifically mentioning the BBOG petition and signature accumulation over time?

Finally, in an effort to assess the impact of a traditional medium in these processes, we assessed the effects of cable television news broadcasts related to the abduction, asking:

RQ4: What is the relationship between televised cable news items over time and signature accumulation over time?

4. Research methods

4.1. Data collection: signatures and tweets

Our data consisted of signatures collected from the [Change.org](#) website through its API and Twitter data collected from the Twitter API. The BBOG petition was created on May 1, 2014 with an end date of May 15, 2015, more than a year later. There were a total of 1,104,440 signatures of which 194,219 (or 17.5%) were publicly available in our dataset. The date range for the 194,219 public signatures was from May 1, 2014 to October 27, 2014. The goal for “victory” was 1.5 million signatures (which was never achieved). Our analysis focused on 189,082 public signatures registered between May 1 and June 5, 2014.

Twitter data was collected from the Twitter API from May 2, 2014 (the day after the BBOG petition was created) to October 18, 2014 using the following query: “All World Leaders Bring Back Nigeria’s 200 Missing School Girls #BringBackOurGirls”. This query consists of the exact phrase that is, by default, tweeted out to a user/signer’s followers when they click on the Tweet button from the [Change.org](#) petition site. This query was chosen so we could obtain all the tweets that originated from a user who signed the BBOG petition and tweeted it for their followers to sign, as well as other individuals simply tweeting about the BBOG issue.

Our analysis focused on 4430 tweets generated between May 1, 2014 and June 5, 2014. Of the 4430 total, 2213 tweets were issued by those who had signed the petition and used the petitioning platforms to tweet to their followers. The remaining 2217 tweets were retweets or tweets that had obtained the petition URL in other ways. Out of the 4430 tweets, 4399 used English as their language (users can choose the language they would like to use in the settings of their profile account), with tweets appearing in French, Japanese, Vietnamese and Filipino. A majority of the non-English tweets contained just the title of the BBOG petition and the petition URL.

4.2. Online and social media: Collection and coding

Online media items related to the kidnapping were collected using Google Advanced Search in a retrospective search of the web. We used the search terms “Nigeria”, “school”, “girls”, “[change.org](#)”, and “petition” in consecutive searches by day beginning with May 1, 2014 and ending with June 5, 2014. In all cases, the search specified English

language items, from any region of the world, with terms appearing anywhere in the page, and in any format. The coding process was carried out by several authors and an undergraduate assistant. All items obtained from the search process were organized in a spreadsheet and then examined and initially coded by a single individual with subsequent examination by two authors. First, the coder examined the relevancy of the link. Items that did not refer to the kidnapping at all were dismissed. All items that were relevant were then coded for the following variables: media type, inclusion of a reference to the [Change.org](#) petition, and whether the item was generally related to African or Black issues. Links that were controversial or difficult to code were examined, discussed, and coded with unanimous agreement by two other authors together with the original coder. Media type was the only variable that encountered controversy in some instances. Whether or not the content referred to the [Change.org](#) petition or whether or not the content source was generally about Black or Africa-related issues was nearly always apparent.

Each link was coded as one of the mutually exclusive categories of media type: mainstream online news, other online news, online magazine, blog, social media (Facebook post, YouTube video, Pinterest, or Instagram), other petitions, non-governmental organization websites, discussion forums, or other. Mainstream online news referred to popular news and television organizations in the U.S. or abroad, such as the New York Times, Canadian Broadcasting Corporation, Fox News, Huffington Post, etc. Less familiar sources of news were categorized as “other news”. When any doubt about the media type category was identified, other authors discussed and agreed on the best category code for this variable. Each link was coded 1 or 0 for the appearance of any reference to the BBOG [change.org](#) petition (in addition to any reference to the BBOG event or topic), and also coded 1 or 0 if the source of content (e.g. the magazine or the news site) was from Africa or generally about Africa or Black-related issues. The date when the content appeared online was captured during the search process.

The search process produced a total of 661 items that were coded as described above. We created two variables to explore the effects of different types of online media. The first, Static Online Media, consisted of 353 items that included all online news media (mainstream and other, 212 items) as well as online magazines (37 items) and non-governmental websites (104 items). The second, Dynamic Social Media, consisted of 302 items including all blogs (255 items), along with other online petitions, discussion forums, Pinterest postings, YouTube videos, etc. (a total of 47 items). A total of 6 items did not appear to fall into any of these categories, so they were omitted from analysis, yielding a total of 655 total online media items.

4.3. Cable television news items

We accessed data from “Television Explorer” (https://television.gdeltproject.org/cgi-bin/iatv_ftxtsearch/iatv_ftxtsearch?), an archive of televised news broadcasts that enables researchers to use multiple keywords to search the closed captioning streams of American television news. The data are reported in the form of individual sentences that match one or more of the keywords inserted into the search. It is possible to set one or more keywords as a “context” term, so that the search keywords returned are those that occur within four sentences of the context term. In this case, we set “kidnapping” as a context term, and then used the same search terms identified previously, that is, “Nigeria”, “school”, “girls”, “[change.org](#)”, and “petition” in consecutive searches by day beginning with May 1, 2014 and ending with June 5, 2014. We searched 7 national cable networks functioning at the time of the abduction, which included: CNN, MSNBC, Fox News, CNBC, Fox Business, Bloomberg, and Aljazeera-America. The search yielded 1026 sentences produced over the 36 day time period.

4.4. General analytic strategy

Time series analysis explores the relationships between two or more time-ordered series of data. In this case, we worked with 6 time series of 36 days each; we explored a time series for (1) petition signatures (the dependent variable in all cases), (2) tweets containing the phrase used in the petition URL, (3) Static Online Media items referencing the abduction of the Nigerian schoolgirls and (4) Dynamic Social Media items referencing the abduction of the Nigerian schoolgirls, (5) a series of media items mentioning the [Change.org](#) petition (from both Static or Dynamic items), and (6) items from both Static and Dynamic item sources that seemed in particular to address African/Black topics. All of our analyses were conducted using Stata's statistical package.

A time series regression analysis begins with tests exploring the characteristics of the data, which help to determine the choice of regression model for analysis. First, we tested each series for stationarity, which assumes that the mean, the variance, and the autocovariance of the series are constant over time ([Box-Steffensmeier, Freeman, Hitt, & Pevehouse, 2014](#)). We used the Augmented Dickey-Fuller test (with 5–7 lags), which is commonly recommended to detect stochastic, trend, and deterministic non-stationarity. If the series involved in an analysis are stationary or can be corrected for non-stationarity, it is appropriate to use standard Ordinary Least Squares (OLS) regression techniques.

Following OLS regression, we tested for another assumption of time series data, which is that the error terms corresponding to different points in time are not correlated. A correlated error term generally indicates imprecision in collection and measurement of data and/or that variables have been left out of the model ([Ostrom Ostrom Jr, 1990](#)). We used the Portmanteau Q test for white noise (7 lags were tested) to determine if there was evidence of correlated error terms.

With evidence of serial correlation, the use of an autoregressive distributed lag regression model or restricted versions of this model, is recommended ([Pickup, 2015](#)); this model includes on the right side of the equation, a lag for the dependent variable, each independent variable and, if necessary, a lag for each independent variable; the procedure generally removes the error correlation. We tested to insure that there was no further evidence of error autocorrelation using the Portmanteau Q statistic.

Finally, we tested for Granger causality using Stata's VAR Granger tests, in an effort to discern which of our time series "granger-caused" the other. The idea of Granger causality is predicated entirely on statistical grounds. According to [Box-Steffensmeier et al., 2014](#), Granger causality enables the analyst to determine whether an independent variable X helps one to predict Y beyond what might be predicted solely on the basis of Y's past history of values.

5. Results

[Figs. 2 and 3](#) present graphic illustrations of each of the time series that were included in our analysis. [Fig. 2](#) graphs the frequency of petition signatures as well as the frequency of tweets. [Fig. 3](#) graphs the frequency of each media time series, including Static Online Media, Dynamic Social Media, items that mentioned the [Change.org](#) petition, items from sources that appeared to be principally concerned with African or Black issues, and the Cable News Items. Although the two figures present data at different scales, they both reveal considerable spikes in frequency for each time series between days 5 to 10 of the petition's history and then considerable attrition beginning at roughly day 17. Note also that the difference in frequencies between the Cable News items and the online media items in [Fig. 3](#) is no doubt due to the fact that Cable News consisted of individual sentences within stories that included one or more of the search terms rather than single intact stories. The number of individual sentences provides some indication of the time that was allocated to presenting news about the event.

5.1. Research question 1

The analysis of RQ1 explored the relationship between e-petition signatures and tweets. We found both time series were stationary for all three causes of non-stationarity, and proceeded to regress signatures on tweets, using standard OLS regression techniques. The analysis produced a significant $F(1,34) = 472.82, p < .01$. However, the Portmanteau Q test indicated the presence of correlated error terms at the 4th lag.

Thus, our analysis proceeded with an autoregressive distributed lag regression model (ADL) utilizing a lagged dependent variable. That produced a significant equation, but examination of the Portmanteau test again indicated the presence of correlated error terms at the 4th lag. We next included a lag for the independent variable; the model tested was: $y = a_0 + a_1Y_{t-1} + B_1X_t + B_2X_{t-1} + e_t$. This model yielded a significant $F(3,31) = 158.87, p < .01$.¹ The Portmanteau Q test indicated the remaining residuals were white noise. Only the coefficient for Tweets was significant ($38.68, p < .01$), suggesting that each additional tweet yielded slightly over 38 additional BBOG petition signatures. We tested for Granger causality (using 1 lag), finding that Tweets granger-caused Signatures (chi square (1) = 36.47, $p < .01$) and that Signatures also granger-caused Tweets (chi square (1) = 56.17, $p < .01$).

5.2. Research question 2

RQ2 addresses the relationship between e-petition signature accumulation and all 655 collected online media items related to the BBOG, divided into Static Online Media and Dynamic Social Media. Following the procedure outlined above, we first examined the stationarity of Static Online Media, and Dynamic Social Media. We found that each variable was stationary around a deterministic trend, which means that the two series would become stationary once the trends were eliminated. We examined the line graphs for both variables as well as the autocorrelation functions, which suggested that the data was characterized by a linear trend, with items decreasing in frequency with the passage of 36 days of data collection.

We thus proceeded to "de-trend" the data by regressing both variables on the time unit of "day," and then examined the residual de-trended variables for stationarity. We computed Dickey-Fuller tests on the newly created de-trended variables and found that both variables were now stationary. We then regressed e-petition signatures on the newly created de-trended Static Online Media and Dynamic Social Media variables, producing a significant $F(2,33) = 13.41, p < .01$, and a significant coefficient for the de-trended Static Online Media variable. However, the Portmanteau tests again revealed the presence of autocorrelated residuals.

We thus moved to the ADL model, including a lagged signature variable; the model tested in this case was $y = a_0 + a_1Y_{t-1} + B_1X_t + B_2X_{t-1} + e_t$. This analysis produced a significant $F(3, 31) = 17.58, p < .01$. The Portmanteau Q test indicated there was no remaining residual autocorrelation. The coefficient for the lagged signature variable was significant ($0.49, p < .01$) as well as the coefficient for the de-trended Static Online Media variable ($1269.68, p < .01$) suggesting that every new static online media item produced a daily increase in signatures of 1270.

Testing for Granger causality, however, indicated there was no evidence of significant Granger causation.

5.3. Research question 3

Research question 3 considered the effects of two additional time

¹ R-squared values are not typically reported in time series analysis since they index the extent to which the regression analysis fits the observed data, rather than the more common concern of time series analysts, which is to assess the extent to which the analysis accurately forecasts future values in a series.

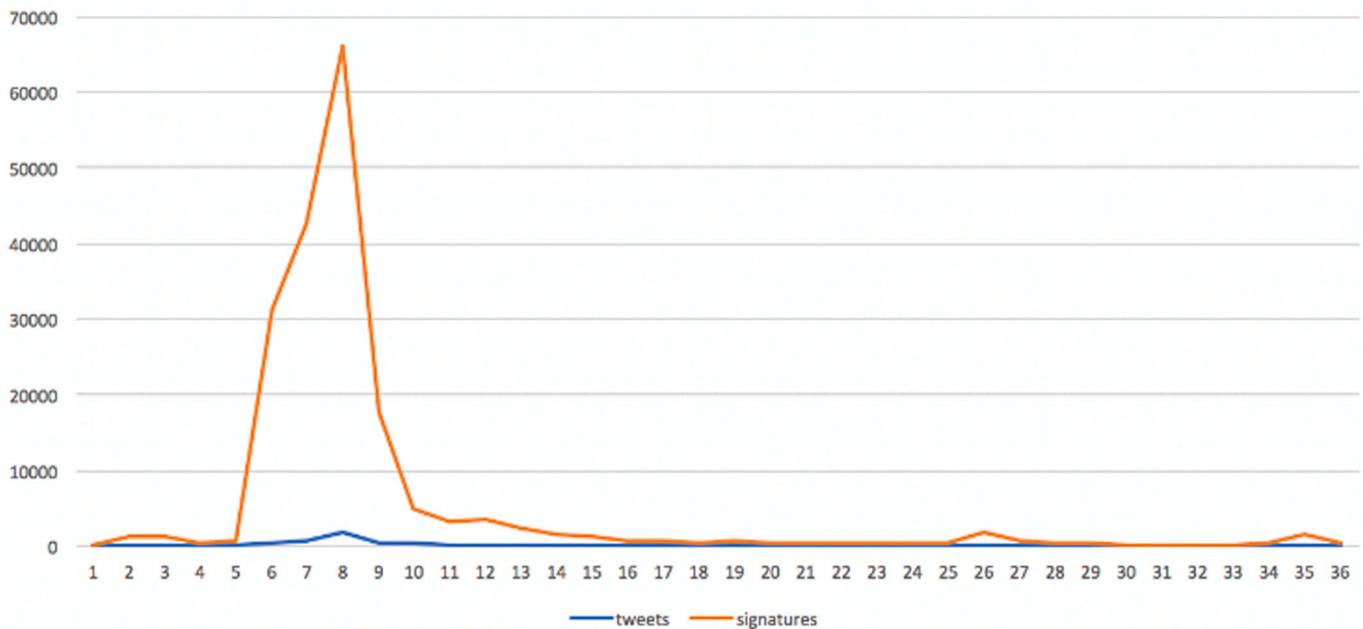


Fig. 2. Frequencies of tweets and signatures by day.

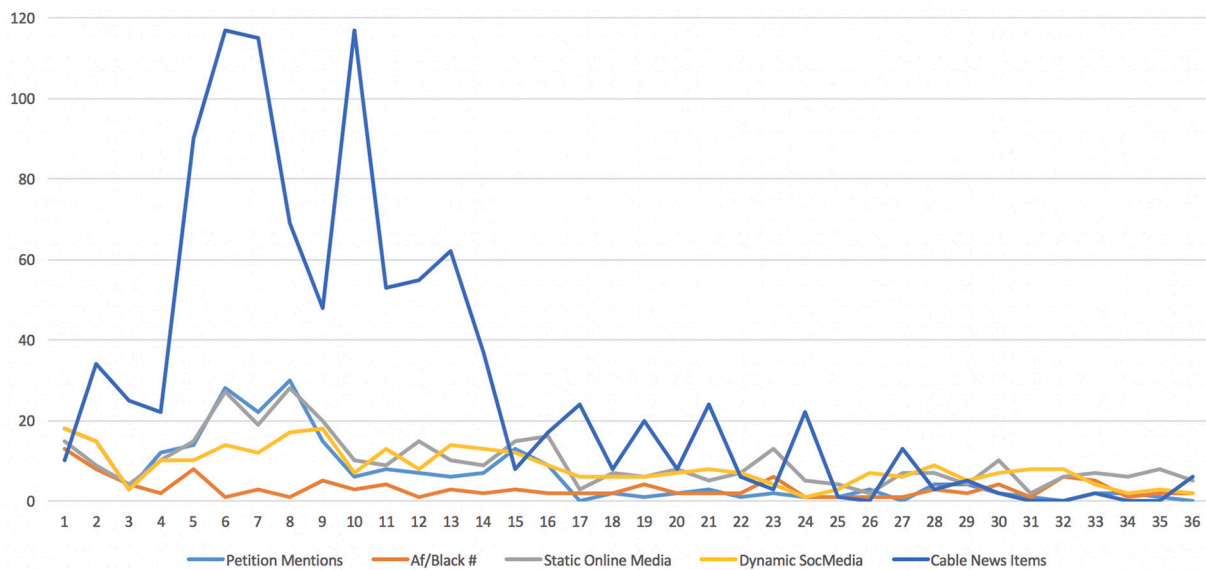


Fig. 3. Frequencies of diverse online media by day.

series that we expected might be related to the accumulation of petition signatures; specifically they were (1) a time series consisting of online items related to the abduction that explicitly mentioned the [Change.org](#) petition (Petition Mention) and (2) a time series consisting of items related to the abduction from sources that appeared to focus on African or Black issues (Afri/Black). Examining the two time series, we found that each was stationary; we proceeded to examine each time series independently.

Following our standard procedures, we regressed signatures on the time series of items mentioning the [Change.org](#) petition, producing an equation with a significant $F(1, 34) = 53.07, p < .01$. The Portmanteau test again revealed the presence of autocorrelated residuals. We thus turned again to the ADL model, $y = a_0 + a_1Y_{t-1} + B_1X_t + e_t$ which used lagged values of the dependent Signature variable.

The resulting equation produced a significant $F(2,32) = 48.67, p < .01$ and two significant coefficients. The coefficient for the lagged

Signature value was 0.33 ($p < .01$) and was significant as well as the coefficient for Petition Mentions (1139.85, $p < .01$) suggesting that each item that mentioned the [Change.org](#) petition produced a corresponding increase in petition signatures of approximately 1139 per day. The Portmanteau Q test indicated there was no remaining residual auto correlation.

We tested for Granger causality finding that the Petition Mention series granger-caused Signatures (chi square = 3.85, $p = .05$); however the reverse was not true.

We then turned to the time series of items related to the abduction from sources that appeared to emphasize African/Black issues. We regressed signatures on the African/Black time series; however, the resulting regression equation was not significant. The Portmanteau test again indicated the presence of auto-correlation. We thus turned again to the ADL model, $y = a_0 + a_1Y_{t-1} + B_1X_t + e_t$ which used lagged values of the dependent variable. The model produced a significant equation with

$F(2, 32) = 16.38, p < .01$; however, the only significant coefficient was for the lagged Signature variable. This suggested that the African/Black time series made no significant contribution to the analysis. We therefore dropped this time series from further analysis.

We conducted one further analysis to assess the inter-related effects of the significant media time series items on signature accumulation. Realizing that a standard OLS regression would produce auto-correlated residuals, we proceeded directly to the ADL model, $y = a_0 + a_1Y_{t-1} + B_1X_t + B_2X_{t-1} + B_3X_t + e_t$, assessing the contributions of the time series for the lagged Signature variable, Tweets, lagged Tweets variable, de-trended Static Online Media, and Petition Mentions to predicting the Signature accumulation time series.

This produced a significant $F(5, 29) = 155.68, p < .01$ and four significant coefficients. The coefficients for the lagged Signature variable (0.51), the Tweets time series (29.56, $p < 0.01$), the lagged Tweet series ($-20.67, p < .05$), the detrended Static Online Media (266.11, $p < .05$) and for the Petition Mention time series (316.2811, $p < 0.01$) were each significant. The Portmanteau Q test indicated there was no remaining residual autocorrelation.

We tested for Granger causality, correcting this time for small sample size. The tests revealed a substantial array of effects, presented in Table 1. We elected to present each Granger cause with a significance level of $p < .10$ or better since each of the variables had achieved a significant coefficient in a prior regression analysis and our analysis is exploratory.

Table 1 suggests, as one would expect, that the Tweet time series, and the time series of Petition Mentions and Static Online Media (both marginally) granger-cause the time series for Signature accumulation over time. The Static Online Media granger-cause Tweets, perhaps because Twitter users often tweet news items. On the other hand, we also see that the Signature time series granger-causes Tweets as well as Petition Mentions, suggesting that reciprocal causation is at work. This may be because the petition platform invites the signer of a petition to immediately tweet to followers about his/her signature, thus signatures may be said to “cause” Tweets. Signatures and Tweets granger-cause Petition Mentions, a phenomenon that may take place when the authors of online news items monitor the signature and related tweet accumulations of a popular petition and then discuss the petition in their stories, one indication of reverse agenda setting. Finally, Signatures and Tweets (marginally) granger-cause the Static Online Media time series, suggesting that the Signature and Tweet ebb and flow is related to the extent to which static online media cover petition-related activity of web-based “producers,” another indication of reverse agenda setting within the online world.

5.4. Research question 4

In our final analysis, we explored the relationship between signature accumulation and cable news items. Adhering to our standard

procedure, we regressed signature accumulation on cable news items, producing a significant $F(1, 34) = 18.66$. However the Portmanteau test again revealed autocorrelation, so we turned again to the ADL model, $y = a_0 + a_1Y_{t-1} + B_1X_t + e_t$ which used lagged values of the dependent Signature variable. The resulting equation produced a significant $F(2, 32) = 21.41$; further Portmanteau tests indicated no further autocorrelation. The coefficient for the lagged signature variable was significant ($0.52, p < .01$) as was the coefficient for the Cable News variable (141.68, $p < .01$). We tested for Granger causality, finding that the Cable News variable granger-caused signatures (chi square = 17.35, $p < .01$); however the reverse was not true.

We incorporated the Cable News item into a second composite regression analysis to assess the inter-related effects of all prior variables plus the Cable News variable. Realizing that a standard OLS regression would produce auto-correlated residuals, we proceeded directly to the ADL model, $y = a_0 + a_1Y_{t-1} + B_1X_t + B_2X_{t-1} + B_3X_t + B_4X_t + e_t$, assessing the contributions of the time series for the lagged Signature variable, Tweets, lagged Tweets variable, de-trended Static Online Media, Petition Mentions and Cable News to predicting the signature accumulation time series. The analysis produced a significant $F(6, 28) = 130.08, p < .01$; the Portmanteau test indicated no residual autocorrelation. Coefficients for the following variables were significant: the lagged Signature variable ($0.47, p < .05$); Tweets (30.06, $p < .01$); the lagged Tweets variable ($-19.64, p < .05$); de-trended Static Online Media (295.32, $p < .05$). The coefficient for Petition Mentions was marginally significant (234.87, $p = .084$) but Cable News was not significant.

We tested all of the items for Granger causality, correcting again for small sample size for this composite test. The tests revealed an array of effects presented in Table 2. We again elected to present each Granger cause with a significance level of $p < .10$.

This set of relationships replicates some of the findings presented in Table 1. Again Tweets granger-cause Signatures, and Signatures granger-cause Tweets. We see also that Cable News granger-causes Signatures, but Static Online Media does not granger-cause Signatures, unlike the result from the first composite analysis. Cable News and Static Online Media (marginally) granger-cause Tweets, in a finding reminiscent of traditional agenda setting in which news media create salience for topics later addressed in online media. We see that Cable News granger-causes Static Online Media, which may seem sensible since the cable television networks also have online versions of themselves, which were no doubt part of our sample. Interestingly, the time series for Signatures, Tweets, and Static Online Media (marginally) are related to the time series for items containing Petition Mentions, as we saw in Table 1, which reflects a reverse agenda setting process insofar as Signatures and Tweets granger-cause the Petition Mentions in online items. In another finding consistent with reverse agenda setting, we see that the time series for Petition Mentions granger-causes Cable News, suggesting that online items that call attention to the [Change.org](#) petition may cue

Table 1
Granger causation between time series.

Granger Cause (F)	Effect on Time Series
Tweets (35.69)**	Signatures
Petition Mention (3.47) [#]	Signatures
Static Online Media (2.99) [#]	Signatures
Signatures (45.05)**	Tweets
Static Online Media (5.06)*	Tweets
Signatures (4.62)*	Static Online Media
Tweets (2.94) [#]	Static Online Media
Signatures (5.89)**	Petition Mentions
Tweets (6.53)**	Petition Mentions
Static Online Media (5.23)*	Petition Mentions

** $p < .01$.

* $p < .05$.

[#] $p < .10$.

Table 2
Granger causation between time series

Granger Cause (F)	Effect on Time Series
Tweets (39.78)**	Signatures
Cable News (14.08)**	Signatures
Signatures (40.61)**	Tweets
Cable News (6.14)*	Tweets
Static Online Media (3.11) [#]	Tweets
Signatures (3.48) [#]	Petition Mention
Tweets (5.04)*	Petition Mention
Static Online Media (3.16) [#]	Petition Mention
Cable News (8.41)**	Static Online Media
Signatures (3.27) [#]	Static Online Media
Petition Mention (10.79)**	Cable News

** $p < .01$.

* $p < .05$.

[#] $p < .10$.

cable television news to the popularity or importance of this story.

6. Discussion

The data reveal a complex but consistent pattern of dynamic associations between the various media time series and the accumulation of signatures in the Bring Back Our Girls petition. On the one hand, it was not surprising to discover a relationship between the time series for tweets and the time series for signature accumulation. The speed and ease of tweet dissemination are regarded as important foundations for viral online effects in general, which gives rise to the possibility that, given an attractive petition topic, the distribution of tweets related to the petition over the 36 days of our analysis would bear a strong relationship to the distribution of petition signatures. On the other hand, it is quite useful to observe empirical support for this expectation, which had not been available prior to this analysis.

The regression analyses also reveal that, beyond tweets, there are time-related relationships between signature accumulation and static online media as well as cable television news items, but not for the dynamic online media items, which, it will be recalled, consisted primarily of blogs (but also discussion forums, Pinterest postings, and YouTube videos). Thus petition signature accumulation reflects the distribution of several different kinds of media that carried news about the kidnapping event. It is not clear why the dynamic online items were not related to signatures, but the finding does underscore the importance of Static Online Media, which includes items related to the kidnapping carried by online mainstream news sources such as *The Guardian*, CNN, ABC News online, the *Daily Mail*, and the *Washington Post*, which are likely to have substantial readerships, as well as other smaller and more specialized news carriers. In contrast, the items included in “dynamic social media” consisted principally of blog posts, which, although difficult to tell for sure, seem unlikely to command readerships comparable to the mainstream news sources and thus unlikely to wield large effects. Indeed, both sets of composite Granger tests found that static online media granger-caused the generation of tweets as does cable news, suggesting that the online and television news media are very relevant to the process of petition signature accumulation through their ability to stimulate the production of tweets. In stimulating tweets that then stimulate signature accumulation, we can see that news media, both online and television, play an important role in the popularity of a petition.

The absence of a relationship between the African/Black source time series and signature accumulation is difficult to explain. While 113 or 17% of the 655 online items were posted by sources that appeared to emphasize either African or Black issues, which would seem to be a natural constituency for the BBOG petition, this time series was remarkable for being unrelated to signature accumulation. However, the relatively flat distribution of items from such sources depicted in Fig. 3 may provide an explanation for the lack of relationship. On the other hand, it is noteworthy that the time series of Petition Mentions marginally granger-causes Signatures in the first composite Granger test; however that relationship drops out in the second Granger test, when Cable News items are included. That signatures and tweets also granger-caused petition mentions in both composite Granger tests further supports the possibility that the continuing development and success of the petition itself and tweets about it was noticed, and reported, by those covering or writing about the BBOG issue.

Thus it appears that with respect to e-petition signature accumulation in the case of BBOG, the various types of online media behave differently, supporting Chadwick's (2013) notion of a “hybrid” media system with diverse media effects, at least insofar as the media system affects this particular case of online collective action. Given international cable news networks, there is reason to expect that mentions of the BBOG event on television would be associated with e-petition signature accumulation, which our findings clearly document. The granger-causation between Cable News items and Signature

accumulation, Tweets, and Static Online Media reflects traditional agenda-setting processes in that the extent of coverage of a story on television appears to affect the likelihood of signing the petition, tweeting about the petition, and the extent of coverage in online media venues.

In contrast, the fact that the time series of Petition Mentions granger-caused Cable News (second composite Granger test), also reflects the reverse agenda-setting possibility that cable television news producers may monitor online items and choose to report on topics that are the subject of a timely petition. Further, Signatures and Tweets also granger-caused online Static Media Items in the first composite Granger test as well as petition mentions (which take place in online media) in the second composite Granger test reflecting the tendency of the online media to track “produser” generated petition popularity and report on events associated with it. Thus, we see both traditional agenda setting and reverse agenda-setting functioning in these analyses, as did Neuman et al. (2014), suggesting a media system in the midst of both kinds of agenda setting. Our results present a media world in which cable TV news and online news stories that covered the story of the kidnapping increased the salience of the petition related to it, generating more signatures and tweets. At the same time, in covering the trajectory of petition signatures and tweets related to it, cable TV news and online news journalists also appear to have adjusted their coverage of the kidnapping accordingly. These inter-related time series paint the picture of considerable interdependence among media in a hybrid media system.

It seems initially counterintuitive to observe that Signature accumulation would also be related to the Tweet time series. That is, until one appreciates the consequences of the [Change.org](#) platform feature that allows petition signers to immediately notify their followers, via Twitter and Facebook, about their signatures and to provide them with information that enables their followers to sign as well, should they be so inclined. This bears the possibility of creating a positive feedback cycle in which signatures generate tweets that may cause further signatures, an effect that underscores the importance of platform design in generating petitioning outcomes.

Our findings are exploratory, so it is too early to know if the pattern of effects we find here will be replicated with future petitions. Further, it is worth bearing in mind that our analysis of petition signatures is partial given that we were able to access only those [Change.org](#) signatures whose owners chose to make them publicly available. There is no a priori reason to believe that non-publicly available signatures would conform to a different frequency distribution than those publicly available. But clearly there is an unavoidable, but considerable, amount of missing signature data in our analysis.

Although [Change.org](#) is a private e-petitioning platform, what we learn from this case has implications for government sponsored platforms in terms of illustrating potentially related media dynamics. As we write, We the People (WtP), an e-petitioning platform created by the Obama White House and continued by the Trump Administration, has now registered over a million signatures supporting a petition calling upon President Trump to release his tax returns. The e-petition was the recent subject of a *New York Times* editorial, as well as a topic for myriad other news stories. There are 12 other petitions as well that have achieved the publicized threshold of 100,000 signatures, which, in theory, obligates the White House to respond. The WtP platform similarly supports the ability of a petition signer to disseminate information about that signature to followers on Twitter and Facebook. Thus WtP, as well as other nationally sponsored e-petition platforms, may be characterized by similar media dynamics. It would seem useful for government to understand the dynamics of signature accumulation and cultivate the ability to forecast the future of petitions of interest. Such petitions may reflect a substantial portion of public opinion expressing views about desired policies. Time series analysis of e-petition signature accumulation presents the promise of such forecasting ability.

However, it remains to be seen what happens to the credibility of

petitioning platforms when sponsoring governments choose to ignore petitions initiated by the public, even when signature accumulations are high. At the very least such actions run the risk of breeding cynicism and distrust on the part of the public that is, on the one hand, invited to express their policy preferences, and, on the other hand, ignored after having done so.

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References

- Baumgartner, F. R., & Jones, B. D. (1993). *Agendas and instability in American politics*. Chicago, IL: University of Chicago Press.
- Baumgartner, F. R., & Jones, B. D. (2002). *Positive and negative feedback in politics*. *Policy Dynamics* (pp. 3–28). Chicago, IL: The University of Chicago Press.
- Baumgartner, F. R., & Jones, B. D. (2009). *Agendas and instability in American politics*. Chicago, IL: University of Chicago Press.
- Baumgartner, F. R., & Jones, B. D. (2015). *The politics of information: Problem definition and the course of public policy in America*. Chicago, IL: The University of Chicago Press.
- Bennett, W. L. (2005). *News: The politics of illusion*. New York: Pearson.
- Bimber, B., Flanagan, A. J., & Stohl, C. (2005). Reconceptualizing collective action in the contemporary media. *Communication Theory*, 15, 365–388.
- Birkland, T. A. (1998). Focusing events, mobilization, and agenda setting. *Journal of Public Policy*, 18(1), 53–74.
- Box-Steffensmeier, J. M., Freeman, J. R., Hitt, M. P., & Pevehouse, J. C. (2014). *Time series analysis for the social sciences*. Cambridge University Press.
- Bruns, A. (2009). *Blogs, Wikipedia, second life and beyond: From production to Produsage*. New York, NY: Peter Lang.
- Chadwick, A. (2013). *The hybrid media system*. Oxford, UK: Oxford University Press.
- Chan, C. L., Lai, J., Hooi, B., & Davies, T. (2017). The message or the messenger? Inferring virality and diffusion structure from online petition signature data. In G. L. Ciampaglia, A. J. Mashadi, & T. Yasseri (Eds.), *Social informatics: Proceedings of the 9th International conference, SocInfo 2017*. Springer LNCS. Oxford, UK, Sept. 13–15. Retrieved from <https://ssrn.com/abstract=3017040>.
- Downs, A. (1972). Up and down with ecology – The "issue-attention cycle". *The Public Interest*, 28, 38–50.
- Dumas, C., Harrison, T. M., Hagen, L., & Zhao, X. (2017). What do people think? E-petitioning and policy decision making. In A. Paulin, L. Anthopoulos, & C. Reddick (Eds.), *Beyond bureaucracy: Towards sustainable government informatisation*. Springer.
- Dutton, W. H., Blank, G., & Groselj, D. (2013). *Cultures of the Internet: The Internet in Britain*. Oxford Internet Survey 2013. Oxford Internet Institute: University of Oxford.
- Hagen, L., Harrison, T. M., Uzuner, O., May, W., Fake, T., & Katragadda, S. (2016). E-petition popularity: Do linguistic and semantic factors matter? *Government Information Quarterly*. <https://doi.org/10.1016/j.giq.2016.07.006>.
- Hale, S. A., Margetts, H., & Yasseri, T. (2013). Petition growth and success rates on the UK no. 10 Downing street website. In *Proc. 5th annual ACM Web science conference* (pp. 132–138).
- Harrison, T. M., & Falvey, L. (2001). Democracy and new communication technologies. In W. B. Gudykunst (Ed.), *Communication yearbook 25* (pp. 1–43). Mahway, NJ: Lawrence Erlbaum.
- Jones, B. D., & Baumgartner, F. R. (2005). *The politics of attention: How government prioritizes problems*. Chicago: University of Chicago Press.
- Jones, B. D., & Baumgartner, F. R. (2012). From there to here: Punctuated equilibrium to the general punctuation thesis to the theory of government information processing. *Policy Studies Journal*, 40(1), 1–20.
- Jungherr, A. (2014). The logic of political coverage on twitter: Temporal dynamics and content. *Journal of Communication*, 64, 239–259.
- Kingdon, J. (1984). *Agendas, alternatives, and public policies*. Boston, MA: Little, Brown and Co.
- Margetts, H., John, P., Hale, S., & Yasseri, T. (2016). *Political turbulence: How social media shape collective action*. Princeton, N.J.: Princeton University Press.
- Margetts, H. Z. (2009). The internet and public policy. *Policy & Internet*, 1, 1–21.
- McCombs, M. (2004). *Setting the agenda: The mass media and public opinion*. Polity Press.
- McCombs, M. (2014). *Setting the agenda: The mass media and public opinion* (2nd ed.). Cambridge, UK: Polity Press.
- McCombs, M., Holbert, R. L., Kousis, S., & Wanta, W. (2011). *The news and public opinion: Media effects on civic life* (2nd ed.). Cambridge, UK: Polity Press.
- Neuman, W. R., Guggenheim, L., Jang, S. M., & Bae, S. Y. (2014). The dynamics of public attention: Setting theory meets big data. *Journal of Communication*, 64, 193–214.
- Ostrom, C. W., Jr. (1990). *Time series analysis regression techniques* (2nd ed.). Newbury Park, CA: Sage.
- Petray, T. L. (2011). Protest 2.0: Online interaction and aboriginal activists. *Online Media, Culture & Society*, 33(6). <https://doi.org/10.1177/0163443711411009>.
- Pickup, M. (2015). *Introduction to time series analysis*. Los Angeles: Sage.
- Roberts, M., Wanta, W., & Dzwo, T. (2002). Agenda setting and issue salience online. *Communication Research*, 29(4), 452–465.
- Rolfe, B. (2005). Building an electronic repertoire of contention. *Social Movement Studies*, 4(1), 65–74.
- Sayre, B., Bode, L., Shah, D., Wilcox, D., & Shah, C. (2010). Agenda setting in a digital age: Tracking attention to California proposition 8 in social media, online news, and conventional news. *Policy & Internet*, 7–32.
- Strange, M. (2011). Act now and sign our joint statement! What role do online global group petitions play in transnational movement networks? *Media, Culture and Society*, 33(8), 1236–1253.
- Tran, H. (2014). Online agenda setting: A new frontier for theory development. In T. J. Johnson (Ed.), *Agenda setting in a 2.0 world* (pp. 204–229). New York, NY: Routledge.
- True, J. L., Jones, B. D., & Baumgartner, F. R. (2007). Punctuated-equilibrium theory: Explaining stability and change in public policymaking. In P. Sabatier (Ed.), *Theories of the policy process* (2nd ed.). Boulder, CO: Westview Press.
- Wike, R., Fetterolf, J., & Parker, B. (2016, October 24). Even in an era of disillusionment, many around the world say ordinary citizens can influence government. Pew Research Center <http://www.pewglobal.org/2016/10/24/even-in-era-of-disillusionment-many-around-the-world-say-ordinary-citizens-can-influence-government/>.
- Wolfe, M., Jones, B. D., & Baumgartner, F. R. (2013). A failure to communicate: Agenda setting in media and policy studies. *Political Communication*, 30(2), 175–192, 2013.
- Yasseri, T., Hale, S. A., & Margetts, H. Z. (2014). Modeling the rise in internet-based petitions. In *Paper available in arXiv [physics.soc-ph] as 1308.0239v3*.
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