Same Day, Different Agenda?
A Comparison of News Coverage Across Print, Television, and Online Media Outlets

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Abstract
Do citizens who attend to different news sources get the same cues about which topics are most important? The U.S. media system includes a wide variety of news outlets, including newspaper, television, and internet sources. Within most of these media types, we argue, individual outlets have incentives to adhere to a common agenda of hot topics. Yet because each type of media is governed by distinct institutional constraints, we expect different media types to produce fundamentally different agendas. We test this idea by tracing attention to policy topics over a six-month period in each of 14 newspapers (national, regional and local) and 5 television news stations, as well as within internet news and blog “memes.” We find that “the” U.S. media operates via not one, but rather two or three primary agendas, which differ not only in which topics get talked about on a day-to-day basis, but also in terms of the overall diversity of topics discussed and the volatility of change over time. The “new media” of television and internet news, for example, is much more homogenous than traditional newspaper news. Thus, while our study validates the use of one or two key sources (e.g., The New York Times, ABC News) as proxies for other sources of that type, our main finding is that the view of the world citizens receive strongly depends on the type of news media they utilize.
Introduction
The importance of the media agenda is well established in the United States. From the vast population of policy problems unfolding in the world each day, news outlets only have room to focus on a few at a time. The few policy topics that are selected to receive the media’s attention affect the rest of the political system. The media agenda also directly influences (and is also influenced by) the public and governmental agendas, shaping which policy problems citizens think about and public opinion in response to those problems (Behr and Iyengar 1985; Iyengar and Kinder 1987; Entman 1989; Iyengar 1991; Dearing and Rogers 1996; Jaspersohn, Shah et al. 1998; Jacoby 2000; McCombs 2004; Iyengar and McGrady 2007), as well as which problems policymakers think about and government policy in response (Birkland 1997; Wood and Peake 1998; Edwards and Wood 1999).

Less clear, however, is whether “the media agenda” is a real phenomenon. Even on the shifting tide from newspaper readership to online news consumption, the U.S. media system remains a diverse body of news sources, including an estimated 1,422 daily newspapers (Neuharth 2008), as well as several major television news networks and online news sites and blogs, not to mention radio news stations, talk radio, and magazines. Yet, the high N of sources run by differing groups of journalists, editors, and corporate management entities begs the question of whether “the media agenda” exists. Specifically, does news coverage across the U.S. center on one common agenda? Two primary agendas? Or perhaps a number of agendas closer to N?

Our question is one of general interest for news consumers. Whether we rely primarily on our hometown newspaper, a national newspaper, the evening news on TV, or online sources for our daily news, most of us would like to know whether the view about the

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world we’re receiving is consistent with what we would get from another source. And, if different sources offer different portrayals of which topics are most important, we would like to know precisely what those differences are.

Perhaps more importantly, our question also touches on core principles of agenda-setting theory. Research on information cascades suggests that even diverse news outlets should be susceptible to the buzz factor surrounding hot topics *du jour*, producing a common agenda to which most news sources generally adhere (Bikhchandani, Hirshleifer et al. 1992; Hamilton 2004). Yet when we consider information cascades in the context of the institutions literature, we should expect various news outlets to respond differently to information cascades by virtue, if nothing else, of the different institutional constraints under which they operate (Baumgartner and Jones 2009). While examining news outlets’ individual-level responses to information cascades is beyond the scope of this paper, simply by comparing the patterns of attention across news sources and identifying any commonalities that may exist, we can determine the extent to which different news sources are or are not processing the same basic influx of real-world information in a uniform manner.

What our question does not address is the probable amount and direction of agenda influence between news sources (Vliegenthart and Walgrave 2009), between media agendas and governmental agendas (Wood and Peake 1998; Peake 2001; Eshbaugh-Soha and Peake 2004; Peake and Eshbaugh-Soha 2008), nor between media agendas and the public (Ucinski 2009; Verhulst and Walgrave 2010). We certainly believe the agendas we study here both influenced and are influenced by other institutional agendas and public concern and mood, but these questions are simply beyond the scope of this paper.

Also beyond the scope of this paper is whether the full portrayal of world events captured by the news is consistent across media sources. Two sources can report on the
same topic, for example, but frame that topic in very different ways. Differences in the frames and the tone of coverage employed in discussing a topic—whether the result of biased journalism or simply good journalism—can have a profound effect on public perception of the topic (e.g., Snow and Benford 1988; Iyengar 1990; Iyengar 1994; Nelson, Clawson et al. 1997; Druckman 2001; Druckman 2004; Entman 2004; Callaghan and Schell 2005; Kent 2006; Chong and Druckman 2007; Hammond 2007; Baumgartner, De Boef et al. 2008; Schaffner and Sellers 2009). Nevertheless, understanding the levels of commonality and difference in news attention between sources simply in terms of the topics being discussed will bring us a long way toward understanding whether the agenda-setting process functions in a fundamentally similar or dissimilar way across individual news sources and broad types of sources.

To parse out how many distinct agendas tend to be at work in the national media, we analyze newspaper, television, and internet news, tracing the number of stories (or in the case of the internet news, the number of quotations, or “memes”) about each topic in the Policy Agendas Project topic coding scheme over a six-month time period, from August 2008 through January 2009. We start by developing and vetting a series of specific keyword strings that accurately retrieve observations relevant to each topic. Then we use each keyword string to search each news outlet during our six-month time period, using the LexisNexis archives for the newspaper and television outlets and the MemeTracker dataset we describe below for internet news and blogs.

By comparing the proportion of each source devoted to each topic each day, we gain a rich view of how attention operates in each context and, thus, the extent to which different sources contribute to one or more common national agendas. We focus in particular on investigating how different “types” of sources—national newspapers, local and regional newspapers, television news, and internet news—are generally unified by an agenda.
common to that type. We also compare source types with regard to scope (that is, how concentrated or diversified their coverage is across different topics) and with regard to volatility (that is, how susceptible each source is to sudden and dramatic change).

On a practical level then, our study offers—to the best of our knowledge—the first empirical comparison of newspaper, television, and internet news sources simultaneously. Our measures are blunt, as we will discuss, but they constitute an important first step in understanding whether the U.S. media follows one or more common agendas. Whether we find that all these sources march to the same beat, one source has no agenda overlap whatsoever with the next, or something in between, our study provides an empirical basis for what we hope will be an increasingly active line of research comparing media agendas across institutional contexts, both within the U.S. and across countries.

**Information Cascades and Institutional Constraints**

Relatively few extant studies compare patterns of news coverage across multiple news sources, and even fewer such studies have been conducted in recent decades. Those studies that have addressed this question have generally found support for the idea of a national media agenda of the trickle-down variety, where key national newspapers set the agenda for local and regional papers (Winter and Eyal 1981; Althaus, Edy et al. 2001; McCombs and Reynolds 2002; Soroka 2002; Van Belle 2003; Druckman 2005) and even for television news (Brown 1971; Crouse 1972). For example, Smith’s (1992) study of media coverage in times of crisis indicates that the New York Times and the Washington Post are the two most important sources of detailed and reliable information for policy makers in the wake of crisis events. Also, Baumgartner, De Boef and Boydstun (2008) compare coverage of the death penalty as well as use of a specific frame in that debate across several different national and regional newspapers and find high correlations in both the level of attention and the use of this key frame.
Each of these studies contributes to our understanding of the similarities and differences between media outlets, yet as far as we know no work looks systematically at the patterns of attention across national and local newspapers, television news, and/or internet news. But we can use what we know about attention and how it operates in different institutional contexts to piece together a theory of the extent to which different news outlets in different contexts should contribute to a common agenda. We draw here on literature about information cascades, institutions, and media in general to explain how, with the exception of local newspapers, we should see the individual sources within a type of source follow a generally unified agenda, but between different types of sources we should observe very different agendas with different properties.

All else being equal, what we know about human behavior and complex systems suggests that we should expect to see news outlets riding the bandwagon when it comes to selecting news items for the agenda. When a topic catches society’s interest, it does not do so gradually but rather on a wave of public awareness—an information cascade (Granovetter and Soong 1988; Bikhchandani, Hirshleifer et al. 1992; Gladwell 2000).

Media dynamics in particular have been shown to exhibit information cascades, both in the context of newspaper coverage to specific issues (Veldkamp 2006; Baumgartner, De Boef et al. 2008) and in the context of internet and blog attention (Götz, Leskovec et al. 2009; Franco and Kawai 2010; Lerman and Ghosh 2010). In a competitive media market such as the U.S., news outlets have strong incentives to mimic one another, both to avoid getting scooped by a competitor and to satisfy their constituency (i.e., the readers/viewers) by covering the hot topics everyone else is talking about (Gans 2004; Hamilton 2004), such as the economic crisis in 2008, Michael Jackson’s death in 2009, or the British Petroleum oil spill in 2010. Thus, news outlets gravitate toward the current hot topics not only by virtue of the frenzy of interest about these topics that infects journalists and editors just like other
citizens but also by virtue of their business strategy. The mimicking agenda behavior that news outlets exhibit is one of the reasons that news coverage—like other agenda arenas—tends not to change incrementally but rather in fits and starts, fluctuating between relatively long periods of stasis (equilibrium) and short but intense periods of dramatic change (punctuations) (e.g., Baumgartner and Jones 1993; Jones, Sulkin et al. 2003; Jones and Baumgartner 2005).

However, the same institutional constraints that we might expect to produce agenda mimicking between media sources in general in fact vary across sources. Different news sources with different institutional constraints will have different incentive structures. The institutions literature demonstrates how institutional structure impacts operations and output, suggesting that the institutional structure in which a given news outlet operates will affect the outlet’s agenda.

At a broad level, we know that each institution’s agenda is shaped by the constraints and preferences of that institution (Baumgartner and Jones 2002). And even within institutions, different combinations of constraints produce different results, both in terms of agenda-setting and in terms of political output such as policymaking or judicial rulings (March and Olsen 1984; Grafstein 1988; Krehbiel 1991; Cox and McCubbins 1993; Cox and McCubbins 1997). Moreover, institutional constraints and the preferences of individuals within those institutions can interact to produce structure-induced equilibrium (Shepsle 1979; Shepsle 1984; Muthoo and Shepsle 2004). Although the work of Shepsle and co-authors has focused on Congress specifically, studies on the Presidency (Skowronek 1993; Jones 1994; Moraski and Shipan 1999) and the Supreme Court (Knight and Epstein 1996; Epstein, Hoekstra et al. 1998; Epstein and Knight 2000) confirm that institutional constraints strongly determine both institutional operations and output.
Additionally, institutional constraints and resulting agenda operations of distinct institutions may influence one another. Flemming and colleagues, for example, find that by conferring and withdrawing benefits and thus rearranging the distribution of political influence and expanding the scope of the conflict for the underlying issue, “politically significant” Supreme Court decisions produce large and enduring shifts in system-wide attention to these issues (Flemming, Bohle et al. 1997; see also Rogers 2001). Other multi-directional causal links between different institutions at the national level have also been demonstrated, most notably links between the media and the Presidency (Edwards and Wood 1999; Flemming, Wood et al. 1999).

In the particular context of news outlets, institutional constraints vary predominantly according to the type of outlet. We focus here on four main types of news sources—national newspapers, local and regional newspapers, television news broadcasts, and internet news and blogs—but of course other types of sources exist as well, such as radio, magazines, and comedy news periodicals and television programs. These news outlets are all linked by a general set of common objectives, including profit and journalistic integrity. And thus in many ways these sources should be linked in the topics they are most likely to pay attention to, since regardless of media context some topics, like crime, will always “sell more papers” than other topics, like agriculture (Gans 2004).

However, in working toward these objectives each outlet faces different challenges, many of which are the result of the particular institutional context in which the source operates. For example, the corporate organization of a media source, its financial solvency and structure, the nature of its constituency of readers/viewers, and at a very basic level the size of its agenda should all affect the source’s behavior in several ways, including the composition of its daily news agenda. While usually these institutional factors vary only
slightly between individual news outlets of the same type, outlets of different type should yield agendas that differ in significant ways.

Thus, different types of news outlets will use different means toward the same basic ends. In particular, we expect different source types to vary in terms of the distribution of their agenda (i.e., how attention is divided across topics), the scope of the agenda (i.e., the extent to which each agenda is spread across many topics or concentrated on only a few), and the volatility of the agenda (i.e., how susceptible it is to patterns of punctuated equilibria as opposed to incremental change). In the context of information cascades and institutional constraints offered above, we discuss each type of news source in turn, identifying our expectations for each source in terms of the distribution of attention across topics, scope, and volatility.

By virtue of their size, relative financial depth, and broad constituency base, national newspapers are positioned to take a diverse approach to the news. Just like every other news type, national newspapers need to keep their audience’s attention. The fact that they serve citizens of all stripes from across the country incentivizes national newspapers to present a broad survey of policy topics, from international issues to domestic policy concerns and from federal-level economic initiatives to local-level education developments, and to pay attention too to non-policy topics like sports and weather. In the context of a relatively large agenda space and journalistic norms that have traditionally encouraged in-depth reporting, national newspapers strive to meet public demand for new news by covering a wide range of topics. Because it takes time to develop and write in-depth articles, however, the agenda of national newspapers takes a bit longer to change than those of its new media cousins. We thus expect national newspapers to have the widest scope of all the sources we compare here, but also the lowest volatility. Although we expect
to see considerable variance across individual national newspapers, we expect to see these papers linked by a general adherence to these properties.

By contrast, we do not expect to see local and regional newspapers connected by common properties except for one: marching to their own drum beat. Most local/regional papers have always operated under the expectation of keeping their readers informed about the local community, and this constraint is becoming more pronounced as people turn more and more to new media sources as an easier way to stay abreast of national and world events. In order to compete for its market share, local/regional newspapers are turning increasingly to focus on those “home town” events and issues that matter to citizens and that citizens can only get through local/regional news. Thus, compared with national newspapers, we expect local/regional newspapers to focus more on local-level domestic policy topics and on non-policy topics. And we expect that the smaller the newspaper, the less that source will adhere with other local/regional newspapers or with national newspapers, television, or internet news to contribute to a common agenda. Additionally, like national newspapers, we expect local/regional newspapers to exhibit a wider scope but a lower volatility than television and internet news.

The television news programs we examine here are geared toward a national audience, meaning that like national newspapers these television sources have strong incentives to cover a variety of topics. However, the organizational structure of television programming puts added pressure on television news shows to focus on policy-related news and focus less on non-policy topics, which are covered in more depth by competing stations and programs. Most television news programs last approximately 30 to 60 minutes, resulting in these sources being highly constrained by both their relatively limited agenda space and the fact that viewers at home have rival sources immediately available at the push of a remote button. Whereas newspapers work to retain their audience on a day-to-day basis.
day basis, expecting readers to evaluate the news source on the merits of its full product, television news programs must capture viewers’ attention immediately. Thus, these sources are incentivized to focus much more narrowly on a few topics, repeating the most sensational of these topics throughout the broadcast to capture viewers who are “channel surfing.” The result is that the scope of the television news agenda should be lower than that of national newspapers. And because television news sources operate at a much faster pace than newspapers, we expect television sources to experience agenda overhaul more frequently and, thus, exhibit a higher level of volatility.

Finally, we expect internet news and blogs to behave differently still. These news sources cater to the widest constituency of all, and thus we expect them to focus more on federal-level policy topics broadly applicable to people not only in the U.S. but around the world, and focus less on local-level policy topics and non-policy topics. Additionally, while some internet news and blogs are profit-seeking enterprises, in general these news sources are not incentivized by financial profit to the same extent that newspaper and television news outlets are. As a result, although internet news and blogs still operate strongly under the goal of capturing viewership, we expect these sources to focus less than these other sources on topics “that sell,” like crime. In terms of the scope of the agenda, we might think that the internet—with seemingly infinite agenda space—would be the most diverse of all news sources, offering the widest spread of coverage across all topics. However, although the internet “space” is enormous, the internet as a network world is actually quite small. (Mention links between blogs and network analysis of internet sites stuff – Trey). The journalistic norms of in-depth reporting that still exist for newspapers have not been, for the most part, ported over to online news. Without financial incentives for journalists to offer detailed exposés, most stories are written as shorter, “lighter” summaries of topics than would appear in a newspaper, and in many cases online news reports and especially

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blogs serve less to produce news and more to recycle news already reported in other online or offline sources. In fact, for all the space it offers, we argue that the internet serves as a kind of “echo chamber” in which a relatively small amount of substantive news gets bounced around, amplified, and redefined. And because internet news and blogs operate at an even faster pace of change than does television, we expect it to have the highest volatility of all, with frequent punctuations in the agenda.

**Measuring Media Agendas**
One of the main reasons so little research has been done comparing media agenda is, we think, because the task of capturing media agendas empirically is no small task. Collecting large volumes of news items can be quite daunting, as can categorizing them by topic, or issue, or whatever substantive unit of analysis is desired—not to mention defining a sensible system of these units in the first place.

This study is no less challenging in terms of the unwieldy nature of the data. We examine news coverage across all policy (and some non-policy) topics identified by the Policy Agendas Project topics codebook for 14 newspapers, 5 television news programs, internet news and blogs. In all, our data consists of more than 62,000 newspaper stories, 13,000 television news transcripts, and 1.3 million internet news items. Based on the large scope of this endeavor, we elected not to employ manual content analysis in order to categorize the full census of these news items (or even a sample). Rather, we identified each relevant news item that made it into our datasets by searching the respective news outlet archive for a specific set of keywords we found to be highly indicative of each topic during the six-month time period between August 1, 2008 and January 31, 2008. For the 14 newspapers and 5 television news programs, we utilized the LexisNexis archives. For

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2 We use this time period both because it represents a tenable volume of data and because the MemeTracker data is currently only offered in reduced “meme” form for this period.
internet news and blogs we used data from the MemeTracker project (Leskovec, Backstrom et al. 2009), which extracts “memes” (i.e., phrases embedded in quotation marks) from “complete online media coverage.” Specifically, Memetracker crawls over 900,000 daily posts from 20,000 mainstream media sites listed in Google News and 1.6 million blogs, forums and other media sites, and generates a downloadable set of 71,658 memes that occur 8,357,586 times across our period of study. Using our search scheme, we select 11,232 unique memes (15.69%) that correspond to 1,204,975 unique occurrences (14.24%) over time. Between August 1, 2008, and January 31, 2009, these memes are found, on average, in 4,187 internet news stories and 3,367 blogs posts each day.  

Within both the LexisNexis and MemeTracker archives, we conducted a series of keyword searches, each designed to retrieve all news items relevant to a given policy (or non-policy) topic. Before beginning this process, we developed and tested these keyword strings thoroughly using comparisons with manual searches, making sure that each keyword set was accurately retrieving nearly all relevant news items while not accidentally retrieving irrelevant ones beyond a small margin of error. The keyword strings are far from perfect, but because our pilot tests of these keywords suggested that the potential for error (either in the form of “false positives” or in the form of “false negatives”) is equally distributed across news sources, time periods, and even topics, we are confident that these data provide an accurate portrayal of our main subject of interest: the relative proportions of attention given by each source to each topic in each time period. A full list of keywords in Boolean search form appears in the Appendix (Tables A1 and A2) for both datasets.

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3 The number of memes occurring in stories and posts reported here represent the mean number of iterations per day for each type as recorded in the Memetracker data. For the online news the mean is reported above with standard deviation of 1,469. The minimum number for stories is 372 and the maximum number of stories is 7,954. Similarly, for those occurring in blog posts the standard deviation is 975 with a min. of 739 and a max of 5,625.
After compiling the results from these searches across each news source into a single time-series of counts across topics, we generate corresponding within source proportions of attention at the daily level. While the total frequency of news items varies widely between TV, print and online sources, proportions support cross-sectional comparisons of attention dynamics across topics and sources.

To identify how many major agendas are at work across these many individual news sources, we subject these proportions to factor analysis\(^4\) in order to learn two things. First, this analysis allows us to calculate how much of the total variance across all sources can be explained by the top key trends, or “factors,” that capture shared variance in the proportion of attention different sources give to each topic over time. We use the principal factor method as opposed to the principal factor approach because this method does not assume that all the variance in our dataset can be explained by common trends. With so many news outlets operating in such a complex environment, even if we had strong reason to believe that all news sources adhere to one common agenda we would expect this coherence to manifest itself in a very “noisy” way. Thus, we are more interested in the relative amount of the total variance explained by each factor and how many major factors exist than we are by how close the explained variance captured by each factor is to 100%.

Second, the factor “loading” of each individual news source on each factor tells us the extent to which the given source hangs together with the given common agenda. Thus, we can test our expectations regarding individual news sources of the same type hanging together but different types varying more widely. And again, even if two or more sources reflect a common agenda, we would not expect the coherence to be perfect. By examining variance in factor loadings not only across sources, but also across topics, we can see what

\(^4\)Specifically, the principal factor method in STATA with the varimax rotation option.
kinds of topics are most likely to be prioritized for citizens in the same way across media outlets.

Next, in order to compare the relative overall scope of attention across each source, we utilize a measure of diversity or “issue entropy” that originated from thermodynamics and information research and is now commonly utilized in media and agenda-setting studies (Shannon and Weaver 1971; Chaffee and Wilson 1977; McCombs and Zhu 1995; Talbert and Potoski 2002; Bevan 2008; Wolfe, Boydstun et al. 2009). For each source type, we calculate a daily Shannon’s H entropy score that is scaled to range from 0 to 1. Here, higher values indicate a distribution of proportional attention to issues that is broad in scope (i.e. a large number of issues receive similar attention), while lower values represent an agenda that is more focused in nature (i.e. a single or small number of issues receive comparably more attention).

In addition to measuring the scope of attention we are interested in the level of volatility in attention. We measure this by using the proportions mentioned above to calculate daily changes in attention across all media types for all topics (%attn_t - %attn_{t-1}). This allows us to compare changes in attention regardless of topic area. These changes in attention create a series of daily distributions of change. The most widely accepted distributional measure in the agenda-setting literature to capture policy punctuations is kurtosis, where high values indicate a distribution with a narrow central peak and abnormally high numbers of extreme values. While it is possible to calculate this measure for our daily distributions of changes in attention, kurtosis scores can be misleading when applied to small samples as they become highly sensitive to extreme values (Hosking 1998). In order to correct for this we calculate l-kurtosis scores for each source type. By utilizing the l-moments method of calculating distributional descriptive statistics l-kurtosis becomes scaled between 0 and 1 and is less susceptible to influence by
outliers (Groneveld 1998; Hosking 1998; Breunig 2003; Wolfe, Boydstun et al. 2009). Here, high values indicate higher levels of volatility (i.e. there are more punctuations in attention illustrated by more extreme values in the distribution) and low values suggest more stability (i.e. there are more observations in equilibrium, as there are fewer extreme changes in the distribution).

**Hypotheses**

We have theorized that individual news sources have strong incentives to follow the flow of hot stories within the parameters of their institutional constraints. But because these constraints are so different depending on the type of the news outlet, different types of outlets will behave quite differently. Evidence in support of this theory would come in the form of cohesive agenda behavior across sources within each institutional “type,” but disjointed agenda behavior across different types. Specifically, we hypothesize the following:

**H1a—Common Media Agenda Within Each Type of Source:** When comparing news sources within the same type (national newspapers, television news, internet news), in general we expect to see signs of a strong common agenda (indicated through a large amount of variance explained by the top factor and high factor loadings by sources on that factor), common degrees of scope (indicated through high entropy values), and common levels of volatility (indicated through high l-kurtosis values). However, we expect local/regional newspapers neither to adhere to one another nor to the other types of sources.

**H1b—Different Media Agendas Across Different Source Types:** When comparing news sources between different types of source, in general we expect to see signs of multiple agendas (indicated through a smaller amount of variance explained by the top factor and high factor loadings on different factors by sources of different type), disparate degrees of scope (indicated through low entropy values), and disparate levels of volatility (indicated through low l-kurtosis values).

**H2—Distribution of Attention:** We expect the national newspaper agenda to be distributed widely across a variety of policy topics (both foreign and domestic, federal and local) and non-policy topics. By contrast, we expect: individual local/regional newspapers’ agendas to focus more on local-level domestic policy and non-policy topics; the television news agenda to focus more on policy topics of all kinds and less on non-policy topics; and the internet news/blog agenda to focus more on federal-level policy topics (both foreign and domestic) and less on local-level policy topics and non-policy topics.
H3—Agenda Scope: With the move from traditional to “new” media types, we expect the scope of each media agenda (as measured by entropy values) to decrease. Thus, we expect the newspaper agendas (national and local/regional) to be the most widely diffuse across topics, the television news agenda to be more narrowly concentrated on a few topics, and the internet news/blog agenda to be the most narrowly focused.

H4—Agenda Volatility: With the move from traditional to “new” media types, we expect the volatility of each media agenda (as measured by l-kurtosis values) to decrease. Thus, we expect the newspaper agendas (national and local/regional) to be least susceptible to agenda overhaul (though still exhibiting punctuated equilibrium dynamics), the television news agenda to be more susceptible to agenda overhaul, and the internet news/blog agenda to be the most susceptible, experiencing the most frequent occurrences of dramatic change.

Results
In general, we find strong support for our expectations. We present our results from testing each of our hypotheses in turn below.

Testing Hypothesis 1A and 1B—Agenda Coherence
In order to determine whether news sources tend to adhere to one common agenda or whether they present to the public divergent views of what topics are most important at the moment.

[Table 2 about here]

Specifically, Table 2 shows the results from five separate tests we performed to evaluate Hypotheses 1a and 1b, which stated in a nutshell that individual news sources should have less in common with other sources than they do with sources within their same type. The values in Table 2 show how the amount of variance in the table offers a comparative view of how news sources vary widely across the country but remain much tighter within their own group. Specifically, Table 2 shows—averaged across sources for each topic but then broken down by source—the percentage of variance explained by the first factor identified. In short, the higher the value in the table, the more the component sources of that type (e.g., for national newspapers; the New York Times and Washington Post) “hang together,” producing one or two key agendas.
The table shows in particular how factor analysis performed across all topics (first column on the left) yields a much weaker top agenda. However, when we compare individual sources strictly within the source’s type we see much higher factor analysis results, we see that individual sources really can be indicative of the broader population of sources of the same type. Thus, the *New York Times* for example, will likely adhere to the broader common agenda as compared with television or internet news but will perform rather poorly in the role of representing sources from other types.

**Testing Hypothesis 2: Distribution of Attention**

Tables 1a and 1b show many similarities across all sources in terms of agenda distribution, such as the relatively low amount of attention given to topics like agriculture, labor, and foreign trade. We see important differences, however, in which topics are prioritized as big ticket items. Newspaper and television news, for example, gives much more attention to crime than does internet news, which makes sense given the fact that internet news and blogs, being less profit-driven, are less incentivized to focus on topics that not only attract attention but attract newspaper purchases and television news program loyalty.

Consistent with Hypothesis 2, we see that national newspaper attention is spread across a range of foreign policy topics including defense and international affairs, domestic policy topics including macroeconomics and banking, and non-policy topics (sports especially). Local/regional newspapers focus a bit more on domestic policy topics such as the environment and energy, as well as non-policy topics. Like national newspapers, television news focuses heavily on domestic policy topics like macroeconomics and banking and focuses on foreign affairs as well, but focuses less than we had expected on other foreign...
policy topics, namely defense. As predicted, television news also deemphasizes non-policy topics. Finally, internet news and blogs prioritize macroeconomics even more than the other news sources and like television news focuses much less on non-policy topics.

For the readers’ interest we also include Figures 1-6 that show the relative proportion of attention given to each of six issues, respectively, by each type of source over time. These issues include macroeconomics; healthcare; defense; foreign affairs; government operations; and law, crime and family. Broadly speaking, some recurring similarities and differences emerge across each series. First, national print and regional/local newspaper sources appear to follow one another closely, often overlapping, for most issues, but exhibit a visible gap in their corresponding coverage of foreign affairs issues. Second, each media type appears to exhibit strong punctuations in their patterns of attention to these six issues, presumably as a result of information cascades stemming from the media and public’s response to key events. One key example is evident in the massive punctuation in online media attention occurring in the government operations issue series as a result of election coverage around and immediately following November 4th, 2008. However, we note that these sharp punctuations in attention occur at a higher frequency and magnitude in television news media than any other source type.

Testing Hypothesis 3: Agenda Scope

In order to test our hypothesis concerning the scope of the media agenda across sources, we utilize daily entropy values to generate single source means over time and perform basic difference of means and variance ratio tests for each dyadic pair. Table 4 reports the mean entropy scores, along with their corresponding standard deviations. While the range of these means is limited, a distinctive pattern is visible: national print media has the broadest, on average, scope of attention across topics (.846) followed by regional print media (.819), online media (.788), and television (.751). Even though the television media is the
most focused over time, the within source variation is highest among the four source types with a standard deviation of .065. Interestingly, the online media source type has the smallest standard deviation in entropy values (.034). Rank ordering these mean values does provide a baseline comparison of the scope of these four agendas, though we now turn to difference of means tests to further empirically examine cross-source variation.

Table 4 also reports the results of from six difference of means and variance ratio tests that compare the mean entropy values and standard deviations between each source pair. The difference of means tests are all statistically significant (p<.01) and indicate that the scope of each source type’s agenda is, in fact, distinguishable from all others by varying amounts. The largest difference occurs when comparing the mean entropy values for national print media and television media (.095), with the smallest difference between national print media and regional print media (.028). These results also indicate that the average scope of the online media agenda is fairly similar to each of the three other sources, with difference values falling in the middle of the distribution (.030, .037, and .058). The variance ratio tests, which examine the null hypothesis that the ratio between the standard deviations is one to one, are each statistically significant (p<.01) except for the national print media and regional print media dyad. Here, we can conclude that the within source variation in entropy values is different (not a one to one relationship) between all pairs aside from print media sources.

[Insert Table 4 about here]

[Insert Figure 8 about here]

Since aggregate measures provide only a summary view of these results, Figure 8 plots the daily entropy values over time for each source. In this figure, the daily nature of our data provides a jagged trend across the time series, though some conclusions are evident. First, the overall rank ordering of scope provided by the mean values above is...
apparent over time as the national print media are consistently the broadest in scope and television the most focused, with a moderate amount of overlap. Second, the time series of television media entropy values is surprisingly volatile: on at least nine dates, there is a sharp drop in entropy (i.e. a significant disproportionate increase in attention to a single or small set of issues) that is not visible in any of the other sources. Despite this abnormality, in most instances steep drops in entropy across the four sources can be attributed to increases in attention to one of the major issues represented in Figures 1-6. For example, the single largest decrease in entropy in the online news source corresponds to a rapid rise in attention to federal government operations on Election Day (November 4th, 2008) as would be expected.

Taken in sum, these results provide mixed evidence in support of hypothesis 3’s acceptance, which suggests that “new” media types will exhibit lower entropy values in order from national print media to online news media. The mean entropy values and the plotted daily time-series show that, as expected, the national news media consistently, and on average, has the broadest agenda scope of the four sources – followed closely by regional print media. Though both television and online media are both considered “new” media relative to print sources, our expectation is that the agenda of the online media will reflect the most focused agenda. Our results, however, indicate that while online media is significantly different and more focused than print media, the agenda of television news media has, consistently and on average, the most focused agenda.

Testing Hypothesis 4: Agenda Volatility
Turning our focus to volatility, Figure 7 illustrates the distributions of the daily changes in attention across our four major media types. The first point of note is that each of the four types exhibits an abnormally large central peak around zero. This is not counter to our
expectations as attention is more commonly prone to be in states of equilibrium than punctuation. However, the distributions of the national and regional/local newspapers depicted in Figures 7A and 7B approximate the contours of a normal distribution much more so than their more modern, television and online counterparts. In particular, the shoulders are much more pronounced and there appear to be comparably fewer extreme values which, in turn, indicate fewer punctuations in the patterns of attention. Yet, a simple visual evaluation of the distributions of changes in attention does not offer sufficient evidence to support or reject the expectations we set forth in Hypothesis 4.

[Figure 7 About Here]

In order to conduct a more thorough test of attention volatility, as discussed above, we calculate the daily l-kurtosis scores and present their mean values in Table 4. Before we discuss the mean values, however, a graphic representation of the daily l-kurtosis values across the media types is presented in Figure 9. As the figure illustrates, the l-kurtosis series are all quite erratic, but with the online media series line appearing to exhibit high l-kurtosis values more frequently, which suggests more punctuations. Yet we note that as we examine our series of l-kurtosis scores, we do not expect any of our media types to exhibit more extreme or more simultaneous punctuations which would be observable through higher l-kurtosis values. Rather, we are interested in the number of times there are high l-kurtosis values, as this also indicates numerous punctuations in attention and would suggest a higher amount of volatility in attention for that media type. Unfortunately, the figure does not provide a clear indication of how frequently l-kurtosis values are observed, as the chaotic movements of the series lines are largely unintelligible graphically.

[Figure 9 about here]

In order to address this issue, then, we turn our attention to the mean l-kurtosis values presented in Table 4. The clearest observation that can be made is that the average l-kurtosis
value for the online media is higher than the other media sources. In fact, it is significantly higher as indicated by the two-tailed difference of means tests also provided in the table. While it is possible for a mean value to be skewed by outlying extreme values, if we again examine Figure 9, we can see that there are no abnormally high values for the online media series that could single-handedly account for the higher mean. Therefore, the summation of all the evidence presented in Figure 7, Figure 9, and Table 4, we are left to conclude that the online media is the most volatile of our four media types. Upon closer examination, the mean l-kurtosis values presented in Table 4 follow the exact ordering that we expect, indicating support for Hypothesis 4.

Discussion
If ever there was a myth of a monolithic U.S. media agenda, we believe this study has debunked it. Prioritization of real-world events varies in important ways across different types of U.S. media sources. We do not have “the media agenda”; we have at least two or three main media agendas at any point in time.

In particular, different news sources talk about different things, with each news source setting its agenda based in large part to the particular institutional constraints at work. Additionally, “new” media sources (television and internet) are both more narrowly concentrated across a few key sources and more volatile than are traditional sources (newspapers). Internet and television news, for example, demonstrates—to our eye at least—all the symptoms of an echo chamber. Rather than serving as an unlimited host of diverse topics, the internet appears to be more like a place to recycle news, comment on the news, and repeat until something more sensational comes along.

At the same time, our study should be rewarding to scholars who often use just one or two individual sources, such as the New York Times, to serve as an accurate representative of that source type.
This paper leaves open several questions that we look forward to addressing. Most especially, we plan to conduct more stringent tests of our keyword-based data, testing the major topic level keywords that we developed for the MemeTracker data but will use now for searching the newspaper and television transcripts. We need to make sure that the major topic keywords will behave at the major topic level in a way that is commensurate to how the subtopic keywords we use for this paper behave.

We feel confident that with these more robust instructors our findings will hold and we will be able to parse out in greater detail the patterns within and between source types that will lead us to a more complete understanding of the conditions under which two or more news sources will contribute to a dominant frame. For now, we have strong, suggestive findings: Researchers will appreciate knowing they can often use a single news source to represent other sources of that type, and citizens will (we hope) appreciate knowing that consulting more than one type of news source is probably worth the time in terms of the informational payoff.
References


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