

# The Gatekeeping Function: Distributions of Information in Media and the Real World

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*There are vast literatures on the ways in which media content differs from reality, but we thus far have a rather weak sense for how exactly the representation of various topics in media differs from the distribution of information in the real world. Drawing on the gatekeeping literature, and utilizing a new automated content-analytic procedure, this article portrays both media content and “reality” as distributions of information. Measuring these allows us to identify the mechanism by which the distribution of information in the real world is transformed into the distribution of information in media; we can identify the gatekeeping function. Reporting on unemployment serves as a test case. Subsequent analyses focus on inflation and interest rates and on differences across Democratic and Republican presidencies. Results are discussed as they relate to negativity, to economic news, and to the broader study of distributions of information in political communication and politics.*

Media gatekeeping has been well studied. We know that journalists and editors have to select from a wide range of stories. We know that their selection is systematically biased, driven by a combination of organizational factors, news norms, and audience interests. And we know that the resulting news content is skewed towards stories that are, for instance, more sensational, and/or unusual, and/or conflictual, and/or geographically proximate.<sup>1</sup>

We have, in short, accumulated a considerable body of work on many different causes and consequences of gatekeeping. That said, we have across a wide range of issues only a vague sense for the actual difference between news and reality. (Though there are some notable exceptions, discussed below.) A big part of the difficulty is that we often do not know what the “real world” looks like.<sup>2</sup> Nor have we typically been able to deal with the entire body of news content. Getting an accurate sense of the gatekeeping effect requires both—it requires that we

compare the distribution of a given phenomenon in real life to the distribution of news on that phenomenon in mass media.

The current article has two objectives. First, and most importantly, the article builds on past work to develop a “distributional” approach to understanding the factors that influence news selection in mass media. Second, the article uses that distributional approach to examine the tendency for mass media to focus on negative over positive information. Automated content analytic methods are used to capture the distribution of tone in stories on unemployment from 1980 to 2008 in the *New York Times*, and this is compared to the distribution of upwards and downward changes in the unemployment rate. Analyses reveal systematic differences between economic conditions in real life and economic conditions as captured by mass media; more importantly, they reveal the gatekeeping function—a distribution function showing the probability with which media select and present stories across a range of tone.

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<sup>1</sup>An online appendix for this article is available at <http://journals.cambridge.org/JOP> containing supplemental analyses and methodological information. Data and supporting materials necessary to reproduce the numerical results in the article are available at the author’s website ([snsoroka.com](http://snsoroka.com)).

<sup>2</sup>Of course, even with the relatively simple economic subjects explored here it is not clear that we can ever really know what the “real world” looks like (see, e.g., Habermas 2003). To the extent that “reality” is contestable, so too are the gatekeeping functions explored below.

This illustrative example is then followed by a number of extensions, examining coverage of inflation and interest rates, and potential partisan bias in both the *New York Times* and in the *Washington Post*.

The approach taken here is intended to contribute to work on media content, but also to work on communication and information flows in politics more generally. On the one hand, tendencies or biases in media content are of relevance across a wide range of political science subfields. Media content matters to campaign dynamics and voting behavior (e.g., Bartels 1993; Johnston et al. 2004; for a review, see Weaver 1996); it matters to public attitudes and political and policy preferences more generally (e.g., Iyengar and Kinder 1987; Jordan 1993; Nadeau et al. 1999); and it matters to policymaking itself (e.g., Edwards and Wood 1999; Soroka 2003). So too do tendencies in the selection, by media as well as other political actors, of particular language and frames (e.g., Edelman 1988; Lasswell 1949; Iyengar 1991). The nature of media content as it is explored below may thus be of critical importance to the way in which we understand political communications and politics.

That said, the approach used here has applications well beyond media studies. Differences in the distribution of information before and after some form of mediation or filtering—by individuals or institutions—are of importance throughout political science. The flow of political information has played an important role in the study of, for instance, the political importance of social networks (e.g., Huckfeldt and Sprague 1987; Katz and Lazarsfeld 1955), new technologies and legislative politics (e.g., Frantzich 1982), and policy implementation (e.g., Placek 1974–75). Indeed, information processing has played a fundamental role in theories of the policy process, beginning with early work on bounded rationality in policymaking (Lindblom 1959). And distributions are at the forefront of recent research by Baumgartner and Jones (1993; see also, e.g., Jones 2001; Jones et al. 2009). These authors examine distributions of policy change, not information per se. But policy change distributions are viewed as reflective of the way in which information is processed by the relevant governing institutions. That is, there is a given (unmeasured) distribution of information which, fed through policymaking institutions, produces a distribution of policy change. The explication that follows borrows from and contributes to this growing body of work.

## Gatekeeping, New Institutionalism, and Negativity

The basic idea of gatekeeping has been cogently stated in Shoemaker's valuable review of the literature: "Simply put, gatekeeping is the process by which the billions of messages that are available in the world get cut down and transformed into the hundreds of messages that reach a given person on a given day" (1991, 1). Gatekeeping as a theory of communications began with Lewin's (1951) work on community dynamics and a notion of gatekeeping that was laid out in terms of food consumption—the selection process by which certain foods reach the dinner table, or not. Lewin saw this as a product of "communications channels" and "gates," metaphors well-suited to a theory of news selection in mass media. Media gatekeeping was then more fully developed in White's (1950) classic case study of a wire editor at a small-town daily newspaper. White catalogued the news stories provided by wire services, and the news stories that ended up in the newspaper, and explored the editor's reasons for including or excluding certain stories. Relatively simple in design, this work emphasized the potential agenda-setting role of wire services, but, moreover, the effect that a single editor's ideas about news could have on media content.

Note that this early work, and indeed much of the gatekeeping literature since, focuses on the selection of one event or another, rather than the selective framing of a single event. Events are of course open to interpretation, and there is a large and valuable literature on issue framing (e.g., Chong and Druckman 2007.) Indeed, some gatekeeping work views selection and framing in tandem (e.g., Donohue et al. 1972). The somewhat more parsimonious view, however, and the one adopted here, is that gatekeeping theory focuses on the selection mechanism. And it is the identification of broader trends in news selection—across individuals, and media outlets, and time—that have made gatekeeping a particularly fruitful theory of news selection. Gatekeeping is in this view more than just a product of an individual's preferences, whims, or errors. Regardless of the editor, or the media outlet, certain types of stories will be selected, while others will not. There is thus a strong possibility that there will be *systematic* differences between news content and the real world.<sup>3</sup>

<sup>3</sup>Though note that this is not necessarily the case. There can be systematic biases in selections that nevertheless produce a broadly representative sample of news content.

Biases in news selection have been portrayed as a function of a variety of factors, including, for instance:

- organization-level factors such as administrative characteristics, working procedures, and cost and time constraints (e.g., Bass 1969; Berkowitz 1991; Donohue, Olin, and Tichenor 1989; Gieber 1964; Jones, Trohldahl, and Hvistendahl 1961; Shoemaker et al. 2001)
- story-level factors such as the geographic proximity of the story, visual features (for television), the clarity (ready interpretability) of the story, and story types—disasters, economics, crime, etc. (e.g., Abbott and Brassfield 1989; Galtung and Ruge 1965)
- extraorganizational, or professional, factors such as journalistic values and norms, and views of “newsworthiness” (e.g., Gans 1979; Johnstone, Slawski, and Bowman 1972).

Much of this work is drawn together in research by Shoemaker and colleagues, which makes clear that the process of gatekeeping occurs at multiple levels—individual, organizational, and so on (Shoemaker 1996; Shoemaker et al. 2001; Shoemaker and Vos 2009).

Note that there are links between extraorganizational accounts of gatekeeping and the recent and growing body of new institutionalist theory in political communications. This recent literature focuses on the ways in which institutions, defined broadly to include journalists’ practices, values, and routines, affect the production of news content. The seminal new institutionalist accounts are found in Cook (1998) and Sparrow (1999). Their work takes a somewhat broader perspective than the gatekeeping literature—it deals not just with the impact of current institutions, for instance, but with the timing and evolution of (and equilibrium in) those institutions, due to a range of sociological and economic factors.<sup>4</sup> Like work on gatekeeping, then, new institutionalist accounts raise questions about the impact of factors such as work routines, economic imperatives, and journalistic norms, among many others, on news content.

Distinguishing between the relative impact of these various factors is, of course, difficult, and this

article makes no effort to do so. That is, the article examines differences between media content and “reality,” where the differences are almost certainly driven by some combination of the many factors outlined above. Even so, the dimension across which information is explored points towards (theoretically if not also empirically) extraorganizational or new-institutional factors, particularly those surrounding views of “newsworthiness.”

In short, this article explores the degree to which newsworthiness may be linked to tone, positive or negative, and the consequent systematic differences between news content and the real world. That newsworthiness may be linked to negativity across a wide range of subjects is readily evident in the literature on mass media (e.g., Altheide 1997; Harrington 1989; Iyengar and Reeves 1997; Patterson 1994; Shoemaker, Change, and Bredlinger 1987; Soroka 2006). These findings are buttressed by literatures on individuals’ disproportionate attentiveness to negative versus positive information, across many (but certainly not all) subjects, in psychology (e.g., Van der Pligt and Eiser 1980; Vonk 1996; Weinstein and Crowds 1968), economics (e.g., Kahneman and Tversky 1979), evolutionary biology (e.g., McDermott, Fowler, and Smirnov 2008), and neurology (e.g., Herwig et al. 2007). These literatures suggest that, for a variety of reasons, negative information is in certain situations viewed as being more important than equally positive information. We thus regularly pay more attention to negative over positive information; or, in media terms, are more likely to select negative over positive stories. The consequent gatekeeping effect may be a systematic difference in the degree of negativity in the real world and in media content.

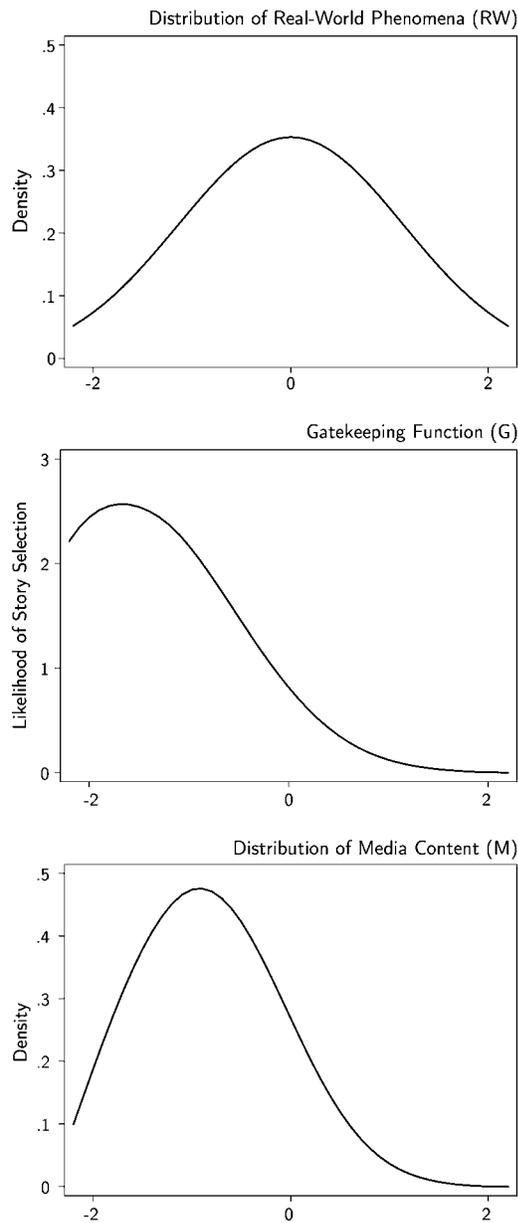
Gatekeeping has been studied by many means. Broadly speaking, one might distinguish between those studies that (a) explore, through interviews or surveys, the decision-making processes by journalist and editors, and (b) examine mass media content itself. This study follows the second approach, described below.

## A Distributional Perspective

This article uses simple probability distributions to understand and then empirically examine the effects of gatekeeping. The basic thrust of the argument is captured in Figure 1. The top panel shows a hypothetical probability density function of some

<sup>4</sup>Sparrow’s work emphasizes economic factors, while Cook’s emphasizes more sociological factors; see a discussion of the differences between the two in Cook (2006). See also, for example, Schudson (2002) and Ryfe (2006).

**FIGURE 1 Gatekeeping: A Distributional Perspective**



real-world phenomenon that is distributed across an as-yet-unnamed dimension  $x$ . (Dimension  $x$  could be low to high, near to far, positive to negative, or otherwise.) For the sake of simplicity, the distribution of the real-world phenomenon across the range of  $x$  is Gaussian, with a mean of zero and a standard deviation of one.

If we were to receive all of this information directly, our experience would look exactly like the

top panel of Figure 1, labeled  $RW$  (for “real world”).<sup>5</sup> But if we receive it at least in part indirectly, through mass media, there is necessarily some kind of filter applied to the information before we receive it. That filter, or gatekeeping, can be depicted as a distribution as well—a distribution of the likelihood with which a given piece of information is selected for mediation. In the example depicted in the second panel of Figure 1, labeled  $G$  (for “gatekeeping”), this likelihood of selection varies systematically with dimension  $x$ .

Note that the illustration of  $G$  in Figure 1 owes much to Groeling and Kernell’s (1998) analysis of networks’ decisions to both commission and report on in-house polling on presidential approval. The authors examine whether networks are more likely to report on in-house polls with particular results; doing so allows them to plot the probability of reporting across varying degrees and directions of change in presidential approval. One strength of this work, and an advantage of the current line of analysis as well, is that it shows likelihoods of reporting across the entire range of possibilities in  $x$ . Results provide a very clear picture of the outcomes that are regarded as newsworthy; and those results do not depend on any a priori decisions about thresholds on dimension  $x$ .

This last point is critical. The distributional approach does not depend on any a priori decisions about the thresholds between, for instance, positive, neutral, and negative. Where presidential approval is concerned, for instance, does news selection vary based on upward shifts being regarded as positive, downward shifts regarded as negative, and stasis regarded as neutral? Or does news selection vary based on the expectation of a slow and steady decline in popularity, and thus minor downward shifts are no more newsworthy than stasis, while equivalently minor upward shifts are as newsworthy as major upward change? (Note that Groeling and Kernell discuss related difficulties, framed as issues of construct validity.) This issue is not exclusive to presidential approval ratings, of course—across a wide range of variables, we do not have a clear a priori sense for the points at which positive turns to neutral and neutral turns to negative; put even more broadly,

<sup>5</sup>Note that by “receive” we mean that the information input would be exactly as it appears at the top of Figure 1. Whether our brains would process all that information equally is another matter—and there are literatures in psychology and neurology (noted above) that suggest that we would not. That is, we might “receive” all of this information, but our brains may systematically privilege information at one (or both) ends of the continuum.

we do not always have an a priori sense for the points at which not-newsworthy turns to newsworthy.<sup>6</sup> As a consequence, (when  $x$  is an interval-level variable) there may be real advantages to an approach to gatekeeping that allows probabilities of selection to vary at every point in the distribution of  $x$ .

For the example below, dimension  $x$  is “tone”—negative to positive. In the second panel of Figure 1, then, editors or journalists are much more likely to select and publish a negative piece of information than a positive one. The likelihood of selection for a negative piece of information is about 2:1; put differently, a single negative event is likely to produce about two media stories. Conversely, the likelihood of story selection for a positive piece of information is about 1:4; put differently, only one in four positive events produce a story. This is a purely hypothetical example, of course, but one that fits with the existing literatures on gatekeeping, on the tone of media content generally, and on human reactions to negative versus positive information.

Returning to Figure 1, the consequences of gatekeeping ( $G$ ) are depicted in the bottom panel, showing media content ( $M$ ). This distribution is produced by multiplying the distribution in the top panel by the selection mechanism in the second panel. That is,

$$M = RW * G. \quad (1)$$

Note that media content in the bottom panel of Figure 1 is not dominated by very negative stories, since there are actually relatively few very negative stories to begin with. But moderately negative stories are more plentiful, and the multiplication of  $RW$  and  $G$  produces an  $M$  in which moderately negative stories clearly dominate.

This perspective on gatekeeping is not new in either process or outcome, but it is more formalized in its theoretical explication than much past work. This has advantages and disadvantages where both theory and empirical analysis are concerned. Empirically speaking, the advantage of this distributional account is that it provides a model that can in principle be applied to real data, in a roughly comparable way across media outlets and countries and policy domains. The gatekeeping function, ( $G$ ), is of course not often directly observable, but we can in certain circumstances measure both real-world indicators ( $RW$ ) and media content ( $M$ ). By doing so,

we can (following from equation 1 above) solve for  $G$  as follows,

$$G = M \div RW. \quad (2)$$

To be clear: given sufficient measures of both the real world and media content, we can directly measure the selection mechanism that turns the former into the latter. We can thus directly observe the gatekeeping function.

There are several difficulties. We must find an issue for which the “real world” is readily observable and clearly varies across a dimension that is reliably measurable. There must also be a corresponding, and measurable, dimension in media content. These are by no means insignificant problems, and there may as a consequence be a range of issues for which this distributional perspective is theoretically interesting but empirically useless.

There are nevertheless a good number of issues (and related dimensions) that are readily and reliably measured in both the real world and in media content. The simplest of these may be macroeconomic trends, regularly reported in media and readily available in the real world, already in the form of interval-level data series.<sup>7</sup> The unit of measurement is different in media than in macroeconomic variables, of course: we cannot measure media content in percentage points of unemployment. But we can look at the distribution of unemployment in standard units, the distribution of media tone in standard units, the differences between these two distributions, and—most importantly—the selection function which is required to convert one into the other.

## Estimating the Gatekeeping Function

### Data

Data are of course readily available for several macroeconomic indicators, but for the sake of parsimony this article focuses in the first case on unemployment. Monthly unemployment data for the United States are drawn from the FRED database, at the Federal Reserve Bank of St. Louis. The media measure is based on an exhaustive database of all stories on economic news in the *New York Times*,

<sup>6</sup>This issue of identifying thresholds related to asymmetric effects has come up in economics as well (see, e.g., Galbraith 1996).

<sup>7</sup>This is of course somewhat of an oversimplification, given that “reality” is (to varying degrees) always contestable. See note 2.

from June 1980 to October 2008. The complete database includes 17,490 stories, an average of just over 51 per month, covering a wide range of national economic issues. The current unemployment-focused analysis relies just on those articles that mention, at least briefly, employment issues. The working dataset thus includes 8,284 *NYT* stories.<sup>8</sup>

These data are coded for topic and tone using *Lexicoder*, new automated content analytic software which implements a relatively simple bag-of-words approach—that is, it counts the number of specific words, using a preestablished dictionary, in each article.<sup>9</sup> Extracting employment articles is relatively simple—the dictionary includes a battery of words dealing with employment and jobs.<sup>10</sup> The measure of tone is similarly simple, at least in principle: it relies on just two categories of words, positive and negative.

The reliability of this automated measure relies entirely on the quality of the dictionary of positive and negative words. Since the 1960s, scholars have been developing lexicons in which words are classified as positive or negative. There are numerous machine-readable dictionaries available for research (e.g., Hart 1984; Mergenthaler 1996; Pennebaker, Francis, and Booth 2001; Whissell 1989). There is also a vast literature by computational linguists interested in developing sentiment lexicons (e.g., Subasic and Huettner 2001; Turney and Littman 2002).<sup>11</sup> The one used here, the *Lexicoder Sentiment Dictionary*, was developed to address some of these shortcomings. In particular, it seeks to expand the scope of coverage without compromising accuracy. The LSD is the product of manually sorting and merging hundreds of affect and emotion categories from three of the largest and most widely used lexical resources for automated content analyses, Roget's Thesaurus (Roget 1911), the General Inquirer (GI, Stone et al. 1966), and the Regression and Imagery Dictionary (RID, Martindale 1990).

<sup>8</sup>A more detailed discussion of the media database is provided in the online appendix at <http://journals.cambridge.org/jop>.

<sup>9</sup>*Lexicoder* is a multiplatform Java-based content analysis utility. The software, as well as the dictionary discussed below, are available at [www.lexicoder.com](http://www.lexicoder.com).

<sup>10</sup>More specifically, employment mentions are captured using the following keywords: employment, unemployment, employed, unemployed, jobs, and jobless.

<sup>11</sup>There is also some debate about whether it is possible to design a context-independent sentiment dictionary. Recent work by political scientists considers, for instance, “machine learning strategies” as an alternative means of automating the sentiment in text. See van Atteveldt et al. (2008).

For the current purposes, suffice it to say that the final dictionary includes 6,016 words scored for positive or negative tone alongside the preprocessing of over 1,500 words. “Tone” for each article is then the percent of positive words minus the percent of negative words. The measure can in principle range from  $-100$  (where every single word in the article is negative) to  $+100$  (where every single word in the article is positive). Practically speaking, in these data the measure ranges from roughly  $-10$  to  $+10$ .

To test the strength of the dictionary for the kind of economic news content used here, results from the automated coding were first compared with results from human coders. Analyses suggest a strong link between human coding and results based on the LSD. The results are available in their entirety in the online appendix; the LSD is also described and tested in much more detail in Young and Soroka (2012).

## Analysis

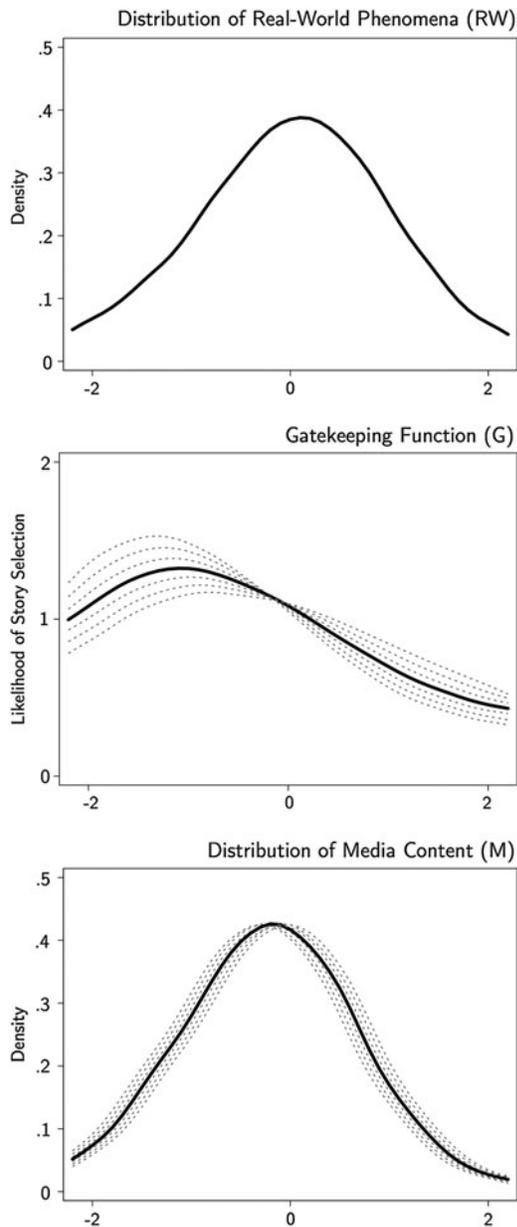
Having generated bodies of both real-world (*RW*) and media (*M*) data, it is possible to estimate the gatekeeping function (*G*). First, both the *RW* and *M* measures have to be converted into more directly comparable units, by dividing each by its standard deviation (and thus converting them both into standard units). The resulting distributions are illustrated in the top and bottom panels of Figure 2. In each case, the illustrations show smoothed (Epanechnikov) kernel density estimates, where the half-width is relatively low—just enough to produce a smoothed plot without obfuscating the underlying distribution.<sup>12</sup>

The distribution for unemployment is shown in the first panel. Recall that these monthly *changes* in unemployment have several advantages over levels: they are, roughly speaking, normally distributed, and—most importantly—they have a natural neutral point, zero. There is also good reason to believe that media respond to change in, rather than levels, of unemployment (see the discussion in Nadeau et al. 1999, 118).<sup>13</sup> The direction of change is reversed here, so that decreases in unemployment (“positive” changes) are on the right-hand side of the distribution.

<sup>12</sup>.1 for *M*; .3 for *RW*; .4 for *G*.

<sup>13</sup>Though note that even working with a comparatively simple measure like unemployment, there are some difficulties in building a measure that adequately captures “newsworthiness.” For instance, even though changes may be more relevant than levels where newsworthiness is concerned, a high unemployment rate for an extended period may well be newsworthy as well. This is not captured in the measure used here.

FIGURE 2 The Gatekeeping Function, Unemployment



The measured distribution of tone in media content is shown in the bottom panel of Figure 2. This panel shows not just a single distribution but a range of distributions, to account for margins of error around the estimated mean value for neutral stories. Recall that the mean for neutral stories was .04. The standard error of that mean, based on the relatively small sample of human-coded stories, is .12. So the distribution of tone is shown in Figure 2 adjusting for a range in tone—from a “negative”

value of  $-.20$  to a “positive” value of  $+.28$  (.04 plus or minus two standard errors).

Overall, the differences between *RW* and *M* are not as stark as we might expect, but we should not underestimate what even small differences between *RW* and *M* can mean for *G*; or, put differently, how powerful (nonuniform) *G* must be to have even a small effect on the distribution of information in media versus reality. That gatekeeping function is shown in the middle panel of Figure 3. To be clear: this is the selection mechanism that likely exists given differences between *RW* and *M*. As for *M*, *G* is shown here as a range of possibilities, based on the range of possibilities for *M*.

The selection mechanism is much as we would expect given the existing literature. The likelihood of story selection is almost always greater than one on the negative side of the range, and almost always less than one on the positive side of the range. Somewhat more stylized accounts are as follows: (a) a modestly negative piece of information is roughly twice as likely to receive coverage as a similarly modestly positive piece of information, or (b) a single piece of negative information produces between one and two newspaper stories, while it takes roughly two pieces of positive information to produce just one story. Both accounts draw links between individual pieces of information and individual stories, however—links which are not directly observed here, only implied. Even a more cautious account is noteworthy, however: the distribution of information in media is more negative than is the distribution of information in the real world.

That said, this more cautious account may not be necessary. By collapsing media content into monthly averages (of tone), and relying on monthly unemployment data, we can estimate a relatively simple autoregressive distributed lag (ADL) model connecting the unemployment rate to media content as follows:<sup>14</sup>

$$Media_t = \alpha_1 + \beta \Delta Unemp_{t-1} + \delta Media_{t-1} + \varepsilon, \quad (3)$$

where  $\beta$  captures the effect of change in the unemployment rate on changes in media content, and  $\delta$  captures the autoregressive component (or, put more substantively, the relationship between media tone this month and the preceding month). The model is then also easily adjusted to capture differential responses to positive versus negative trends in unemployment,

<sup>14</sup>Note that the models used here are similar to those in Soroka (2006).

TABLE 1 Unemployment and Media Content

	Dependent Variable: Media Tone <sub>t</sub>	
Δ Unemployment <sub>t-1</sub>	-.510* (.161)	
Δ Unemployment: Increase <sub>t-1</sub>		-.970* (.281)
Δ Unemployment: Decrease <sub>t-1</sub>		-.051 (.281)
Media Tone <sub>t-1</sub>	.356* (.051)	.345* (.051)
Constant	-.211* (.030)	-.159* (.040)
N	337	337
R <sup>2</sup>	.179	.189

Note: Cells contain OLS regression coefficients with standard errors in parentheses.

\*  $p < .01$ .

$$\text{Media}_t = \alpha_1 + \beta_1 \Delta \text{Unemp}(Up)_{t-1} + \beta_2 \Delta \text{Unemp}(Dn)_{t-1} + \delta \text{Media}_{t-1} + \varepsilon, \quad (4)$$

where  $Unemp(Up)$  is equal to the current change in unemployment when unemployment is increasing and otherwise equal to zero, and  $Unemp(Dn)$  is equal to the current change in unemployment when unemployment is decreasing and otherwise equal to zero.<sup>15</sup>  $\beta_1$  thus captures (short-term) responsiveness to a worsening unemployment rate, while  $\beta_2$  captures responsiveness to an improving unemployment rate.<sup>16</sup> These models provide a much less nuanced picture of the gatekeeping process, but they do go some way towards confirming a connection between, at any given point in time, the unemployment rate and media content.

Results in the first column of Table 1 confirm the connection between the unemployment rate and media tone: a one-unit increase (decrease) in the monthly change in unemployment is related to, on average, a .51-point decrease (increase) in the

monthly change in tone.<sup>17</sup> Results in the second column then reflect the same asymmetry evident in Figure 2: the effect of an increase in unemployment has a larger and significant impact, while there is no reliable effect for an equivalent decrease.<sup>18</sup> These simple regressions serve two purposes. First, they confirm that media content on the economy is systematically related to the economy.<sup>19</sup> Second, they lend support to the stylized accounts discussed above; they support the notion that the distributions in Figure 2 are a product of decisions about individual pieces of information, whereby negative trends regularly get more coverage than positive trends. Indeed, based on these coefficients, a one-point increase in unemployment is associated with an average one-point drop in media tone, while a one-point decrease in unemployment has no systematic connection to media tone at all.

## Replications and Extensions

Do the same results obtain using other subjects, or other media? How does the gatekeeping function vary across media outlets, or over time? This section provides initial tests of some of these questions, and in so doing it suggests the applicability and potential of a distributional approach to gatekeeping across a range of subjects, as well as the importance of the consequences of gatekeeping for public opinion and politics.

### Gatekeeping in Other Economic Domains

The psychological account for why negative information is selected over positive information suggests that the negativity bias should be readily evident across a wide range of subjects and mass media. At the same

<sup>15</sup>Note that we expect the sign on both positive and negative changes to be negative: upward shifts in unemployment should be associated with decreases in tone, while downward shifts in unemployment should be associated with increases in tone.

<sup>16</sup>There is one minor difference between this model and one used in Soroka (2006): unemployment is included at  $t-1$  rather than  $t$ . This is to account for the possibility that unemployment data are not released at the very beginning of each month, and thus some media content each month may have been published before economic data are available. (That said, results are very similar even when unemployment is included at  $t$ .)

<sup>17</sup>Given that the standard deviation of media tone is .51 (mean, -.32), the change is by no means inconsequential; though note that the mean monthly change in unemployment is of course relatively small (.004, though with a maximum during this period of .5).

<sup>18</sup>The coefficient for negative shifts is statistically different from zero, while the coefficient for positive shifts is not. Based on a two-tailed test, the coefficients are also statistically different from each other ( $F=3.97$ ,  $p=.04$ ).

<sup>19</sup>This link is as we should expect, and it is in line with findings in some past studies (e.g., Nadeau et al. 1999), though in contrast with others, suggesting no link between reality and economic news (e.g., Fogarty 2005). That said, there are important differences in specification across studies, and a focus on *change* in economic circumstances may be critical.

time, subjects, institutions, and markets do vary, and these may produce somewhat different gatekeeping functions. This section presents a first—admittedly narrow—cut, looking at whether the results found for unemployment also obtain for articles dealing with either inflation or interest rates. Macroeconomic measures are again drawn from monthly data in the FRED database. Inflation is captured using monthly changes in the 12-month change in the Consumer Price Index; for interest rates, monthly changes in the base interest rate.<sup>20</sup> Just as for unemployment, both are standardized, and the directions are reversed, so that “positive” information (decreases in either inflation or interest rates) appears on the right of the distributions. And media content relies on the same body of *NYT* data, though in these cases focusing on articles that mention either (a) “inflation” or “cost of living” or (b) “interest rate.”

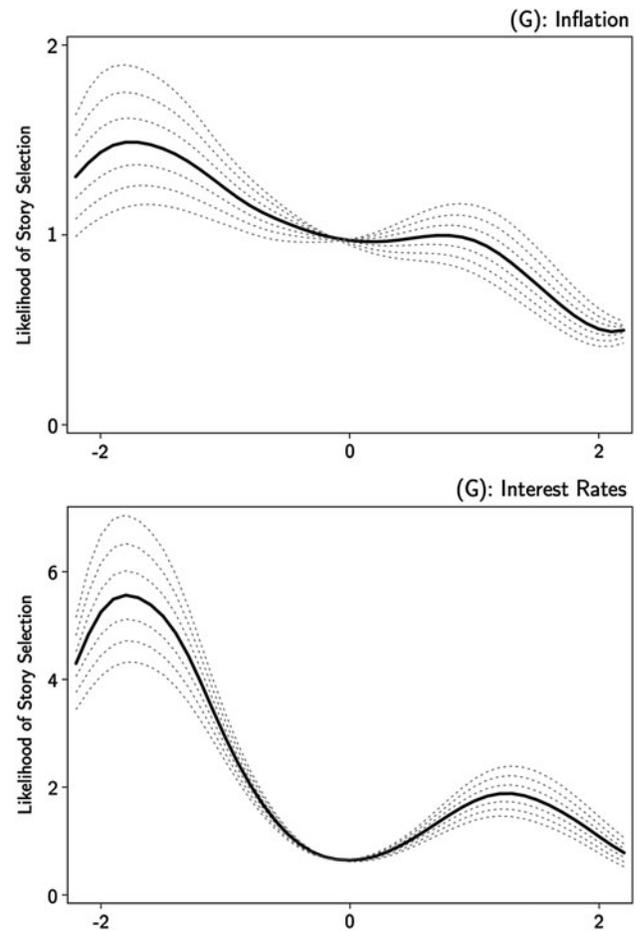
Distributions for the “real world” (*RW*) and media content (*M*) are not shown here; rather, Figure 3 shows just the most critical graphic: the gatekeeping function (*G*), first for inflation and then for interest rates. (Full results for *RW*, *M*, and *G* are included in the online appendix.) Both cases serve as a confirmation of the results found for unemployment above. Again, even taking into account measurement error for the “neutral” point in media tone, negative information is more likely to be selected into news content than positive information. That said, there are some differences in *G* across Figures 2 and 3. The gatekeeping functions for both inflation and interest rates do suggest a bias towards negative information. Particularly where interest rates are concerned, however, *G* is multi-peaked—a consequence of the *not*-selection of stories closer to neutral. Negative information on interest rates quite clearly make the news; positive swings somewhat less so; but no change in interest rates, predictably perhaps, appears to produce rather little news coverage.

### A Liberal Bias?

There has been a good deal of discussion, in both academic and popular outlets, of whether there are liberal or conservative biases in news media. The popularized view is that media (and especially the *NYT*) have tended to provide a more liberal view of

<sup>20</sup>Again, these measures come close to, but do not perfectly capture, “reality,” where either inflation or interest rates are concerned. Note, for instance, that low inflation for an extended period can be quite bad, though there was no instance of this in the time period examined here. Prolonged low-interest rates can also have negative consequences, though here the focus is just on monthly changes.

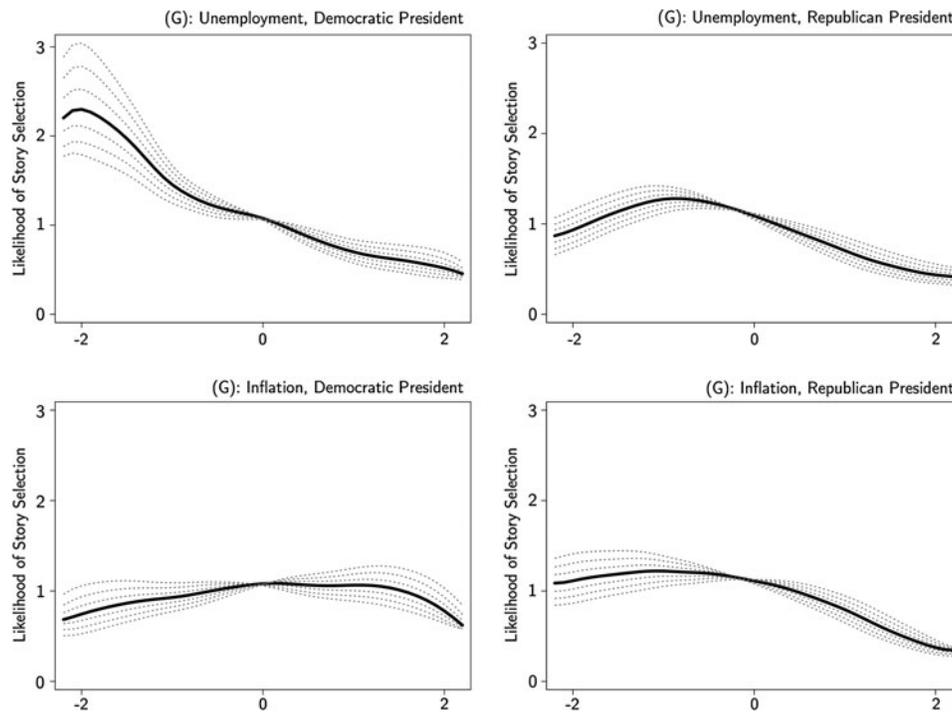
FIGURE 3 Gatekeeping Functions, Inflation, and Interest Rates



both national and world events. Whether this is in fact true is another matter. There are bodies of evidence, anecdotal and empirical, supporting both views (see, e.g., Alterman 2003; Eisenger, Veenstra, and Koehn 2007; Hamilton 2006; Goldberg 2002; Groeling 2008; Groeling and Kernell 1998; Jamieson and Waldman 2003; Niven 2002; Schiffer 2006; see also a meta-analysis by D’Alessio and Allen 2000).

If a liberal bias exists, it may be true that a negativity bias in the *NYT* will be greater during Republican administrations. Note that this—varied coverage of a topic related to partisan differences—is different from much of what has been investigated as bias before. Bias is typically investigated in terms of a bias towards coverage of one party or another, for instance, or as a tendency to focus on bad news about one party and good news about another (see citations above). Note also that there is an alternative hypothesis to be drawn from the literature on the economy and government popularity, namely, what Carlsen

FIGURE 4 Gatekeeping Functions: Unemployment and Inflation under Democratic and Republican Presidencies (*New York Times*)



(2000) has referred to as the the “salient goal hypothesis,” whereby each party is held accountable on its most salient (economic) dimension: unemployment for Democrats and inflation for Republicans (as in Powell and Whitten 1993).<sup>21</sup> Media, like voters, may be more critical of Democrats on unemployment and more critical of Republicans on inflation.

These are empirically testable possibilities; testable, that is, by looking at results for  $G$  when we divide the *NYT* data into two separate samples. Figure 4 compares the resulting gatekeeping functions, for unemployment and inflation, during Democratic and then Republican administrations. (Full results for  $RW$ ,  $M$ , and  $G$  are included in the online appendix.) Note that in each case results are based on the distribution of both  $M$  and  $RW$  during the relevant partisan administrations only. So coverage of each party is assessed taking into account only the distribution of economic information while that party was in power. Results consequently provide a particularly powerful test of the relationship between

“reality” and media content during Democratic versus Republican administrations.

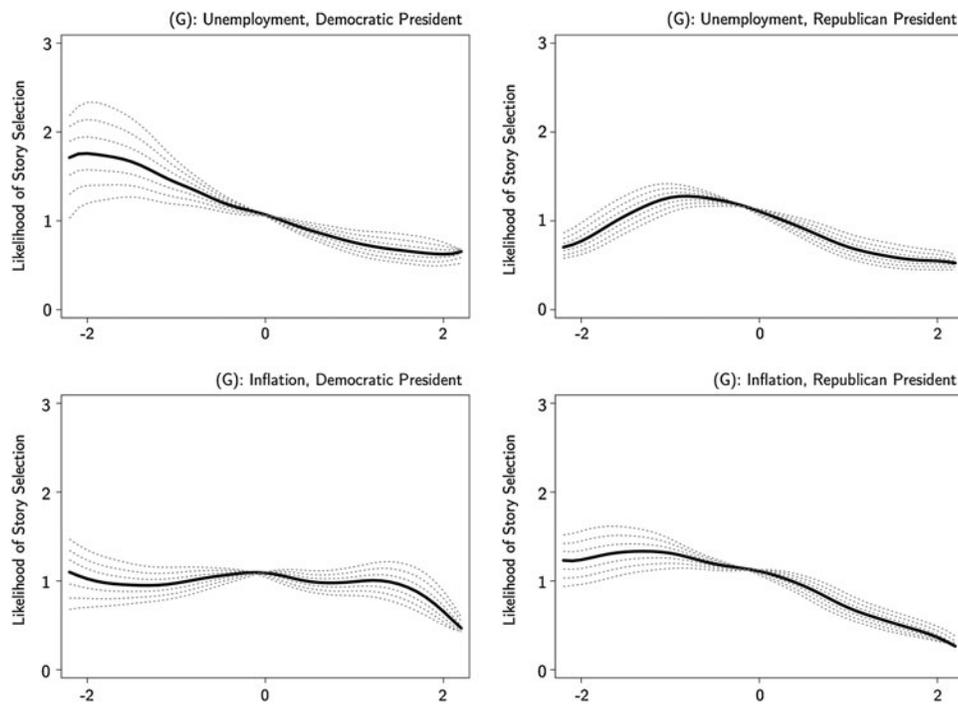
Results in Figure 4 do not support the notion of an ongoing Democratic bias in the *NYT*; more precisely, they do not suggest that there is a greater emphasis on the negative during Republican administrations.<sup>22</sup> They do support a media equivalent of the salient goal hypothesis: media content on unemployment appears to be more negatively biased during Democratic administrations. The difference where inflation is concerned is less stark, though it does lean towards the possibility of a more negative tilt during Republican administrations. But the gatekeeping function for unemployment under Democrats is by far the most striking.

There is no reason to believe that these findings are exclusive to the *NYT*, particularly given that newspaper’s reputation as pro-Democrat. But, again, this is a testable hypothesis, and so Figure 5 shows results from an analysis relying on a directly comparable sample of news stories from the *Washington Post*. (Full results for  $RW$ ,  $M$ , and  $G$  are included in the online appendix.) The sample is drawn from the

<sup>21</sup>Carlsen (2000) contrasts this with the “clienteles hypotheses,” whereby Democrats benefit from high unemployment while Republicans benefit from high inflation, regardless of who is in power (as in Swank 1993). This clientele hypothesis does not suggest any systematic difference in the focus of voting (or media content) across administrations, however.

<sup>22</sup>Though note that this does not preclude the possibility that, across a wide range of topics, the *NYT*, alongside other media, may lean towards the left.

FIGURE 5 Gatekeeping Functions: Unemployment and Inflation under Democratic and Republican Presidencies (*Washington Post*)



same time period, using the same means of data extraction and content analysis as is described above.<sup>23</sup>

Results are strikingly similar. Again, there is overall a bias towards the negative, and this on its own is important confirmation of results in the preceding sections. But it is also true that, like the *NYT*, the *Post* seems to be more negatively oriented in its reporting of unemployment when Democratic presidents are in power; and perhaps slightly more negatively oriented in its reporting of inflation when Republican presidents are in power.

## Discussion and Conclusions

The focus in the opening sections of this article was less on the economy or negativity per se, and more on the potential for a distributional approach to gatekeeping. That potential has been investigated above; results do nonetheless also have implications for work on both negativity and economic reporting.

Where negativity is concerned, results above echo past work suggesting that mass media produce content that is systematically more negative than reality. This is the case for employment, inflation, and interest rates, at least, and it seems unlikely that this selection mechanism is unique to these subjects. If this negativity bias is linked to psychology, and even evolution, as some literatures suggest, then these findings may be generalizable across cultures and countries; that is, the gatekeeping function identified here may be roughly similar across a wide range of issues and media outlets.<sup>24</sup> That said, to the extent that journalistic norms, media competition, or organizational procedures are involved, we might expect systematic differences between public versus private media, or conglomerate versus private media outlets. Certain issues may present greater or lesser negativity biases; biases may vary systematically across new outlets, or mediums, or geographic regions as well. New institutionalist accounts of news production (see the discussion above) alongside

<sup>23</sup>Overall, there are 9,153 *Washington Post* articles in the working database. These data are perfectly consistent with the *NYT* sample; see the online appendix for details.

<sup>24</sup>And note that this relative importance of negativity is connected to a work exploring, for instance, (a) negative advertising (e.g., Ansolabehere and Iyengar 1995; Geer 2006), (b) negative voting (e.g., Fiorina and Shepsle 1989; Kernell 1977), and (c) negative framing (e.g., Redlawsk 2006; Tversky and Kahneman 1981).

recent comparative research on media systems (e.g., Aalberg, van Aelst, and Curran 2010; Hallin and Mancini 2004; Iyengar et al. 2010) point towards these possibilities, as well as a host of related hypotheses that may be testable using the approach outlined here. And, of course, gatekeeping functions can be estimated for far more than just tone.

Where economic news is concerned, the implications of these findings are relatively clear. The public is not *completely* misinformed about the state of the national economy—overall, the distribution of information in reality leans just slightly towards the positive, while the distribution of media content leans slightly towards the negative.<sup>25</sup> These differences between reality and news content may matter, however. There is after all a growing body of work showing a connection between media coverage of the economy and economic attitudes (Behr and Iyengar 1985; Nadeau et al. 1999; Sanders, Marsh, and Ward 1993; see esp. Soroka 2006, as well as a replication using the data in this article in the online appendix). It follows that, if media overrepresent negative economic trends, people will tend to have a view of the national economy that is somewhat more negative than is warranted. This inaccurate view may have perverse consequences for the economy itself, as consumption may be driven by inaccurate views of the economy (e.g., Batchelor and Dua 1992; Roper 1982). It may help account for why politicians seem to suffer from negative economic shifts, but not benefit from positive ones (e.g., Bloom and Price 1975; Headrick and Lanoue 1991). And if public policy responds to either media reports, or the inaccurate preferences of citizens, policy itself may be misdirected (Dua and Smythe 1993).

The broader goal of the preceding work has been to demonstrate the potential strength of a distributional approach to gatekeeping and to the study of political communications and information flows more generally. As noted above, this work fits well with (and draws considerably from) recent developments in the study of budgetary politics, where Baumgartner and Jones (1993) and colleagues have used distributional statistics to explore punctuated equilibria in policymaking—characterized in part as

<sup>25</sup>That the difference between media and reality is in this case moderate is, of course, a good thing, and perhaps not surprising given the literatures suggesting, for instance, systematic connections between economic conditions and voting behavior and aggregate-level “rational” responsiveness to both macroeconomics and government policy. (On voting behavior see, e.g., Duch 2008; on public responsiveness, see, e.g., Soroka and Wlezien 2010.)

consequences of limitations in attentiveness and information processing. It also adds to a wide range of studies concerned with gatekeeping and information, including work on social networks and on legislative behavior and policy implementation (noted above), but also research on relationships between political campaigns’ press releases and media content (e.g., Flowers, Haynes, and Crespín 2003), or on the exercise of discretionary jurisdiction by upper-level courts in the United States (e.g., Baum 1977; McGuire and Palmer 1996), for instance. In short, the study of distributions, and the relationships between distributions, may have benefits well beyond the media gatekeeping analyses conducted here.

For the time being, this work has drawn on distributions of real-world and media data and has produced a selection distribution that characterizes the nature of gatekeeping across different values of tone. It has produced a picture, literally, of the gatekeeping function. And it has produced a template with which to study and compare gatekeeping and information flows across media outlets, individuals, institutions, countries, topics, or time.

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