How Media Storms and Topic Diversity Influence
Agenda Fragmentation

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Political communication scholars have long warned of the danger of fragmented media agendas on public discourse and debate. This research develops a better understanding of agenda fragmentation in the American mass media by leveraging a data set of broadcast and partisan cable agendas over five years to examine the conditions under which agenda fragmentation, and agenda congruence, occurs. Using measures of agenda diversity and media storms, I demonstrate that agenda fragmentation is conditional on the broader media environment, with news outlets exhibiting congruence in agendas when coverage is skewed toward one or a few large issues and coverage that reverts to "niche" issue agendas during periods of time not characterized by issues that take up high levels of the agenda space. In particular, traditional broadcast sources show the effect over the broader media agenda, particularly when those sources exhibit media storm–type coverage. No similar effect is found for cable news sources. This research illuminates the conditional nature of agenda fragmentation and points the way forward for a more nuanced understanding of agendas in a diverse media ecology.

Keywords: agenda setting, media diversity, media storms, agenda fragmentation

The agenda-setting function of the American mass media in creating audience consensus with regard to the most important issues facing the country represents one of the most important influences of the press (McCombs & Shaw, 1993; Shaw & Martin, 1992). In the 21st century, however, this function of the media is in question. Though empirically demonstrated in hundreds of articles since publication of McCombs and Shaw's (1972) Chapel Hill study, the diversity present in the modern media environment has led researchers to raise serious questions as to whether the today's media have the capacity to influence the public agenda in the ways they have in the past, or if the fragmented media in today's communication ecology transmit disparate agendas to their audiences and, as a result, show little correspondence in what constitutes the most important issues of the day (Althaus & Tewksbury, 2002; Bennett & Iyengar, 2008; Prior, 2007; Williams & Delli Carpini, 2011).

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Agenda fragmentation is typically defined as a disconnect in the ordering of issues that make up agendas as a by-product of political polarization, among either the public or media sources themselves (Bennett & Iyengar, 2008; Gruszczynski, 2019). Although it makes intuitive sense in an era characterized by "long tail" economics of "niche" media that news sources would cater to the demands of their audiences, the actual mechanics of media agenda fragmentation have proved to exhibit a great deal of nuance. For example, research into the fragmentation of media agendas specifically has found some evidence of general correspondence between disparate sources and also nuance in the ways in which partisan media have the capacity to set the agendas of traditional media sources (Vargo & Guo, 2017; see also Guo & Vargo, 2017). Evidence likewise exists of correspondence between broadcast and cable news during the 2008 economic collapse (Searles & Smith, 2016), between online and traditional media sources' agendas (Maier, 2010), between partisan blogs and traditional media (J. K. Lee, 2007), and between blog and traditional media coverage of presidential campaigns (Gruszczynski & Wagner, 2017) and campaign controversies (Gruszczynski, 2015). However, to this point, we know less about whether and how skew in the distribution of media attention across issues as the result of exogeneous sociopolitical events can serve to constrain media agendas in a way that will drive them to exhibit lower levels of fragmentation.

This research seeks to broaden our understanding of fragmentation and congruence in media agendas though the use of a cross-sectional longitudinal study that made use of an array of media sources over a five-year (2007–2012) period. I hypothesize that although media diversity is associated with fragmentation of media agendas, the fragmentation of agendas itself is constrained by the broader political and economic environment in two important ways. First, in periods when issue coverage suddenly becomes intrusive, as in the case of media "storms" (Boydstun, Hardy, & Walgrave, 2014), the media source agendas will become more congruent. Second, decreases in the diversity of media agendas—defined as the "spread" of agenda space across a range of social and political issues—will also be associated with increases in cross-media congruence. Given that media resources are constrained—by time, reporters, and space—whether or not the agenda spaces of media outlets are spread across many, or a few, news events and topics is an indicator of not only the broader sociopolitical environment, but also resource allocations within those organizations, and this research theorizes that changes in the spread and skew of media attention across issues have substantive effects on the extent to which media outlets exhibit fragmented or cohesive agendas.

Literature Review

Given the sheer size and diversity of the media in the United States, there are serious doubts as to whether the agenda-setting function of the press continues to operate. For one, specialization of the media and the audience choice that comes with it can become fragmented along political/apolitical lines (e.g., Prior, 2007), with the politically disinterested disconnecting from politics altogether. Equally problematic is the possibility that news agendas among political media are systematically differing along ideological lines (Stroud, 2011; Williams & Delli Carpini, 2011; see also Bennett & Iyengar, 2008).

To be sure, some research has been conducted to investigate these questions for particular media types and political issues. Searles and Smith (2016), for example, found that during the 2008 U.S. economic collapse, broadcast and cable media outlets tended to correlate in the proportion of coverage given to economic news and that fragmented media tended to respond to audience demands for this news type. In a similar vein,

Gruszczynski and Wagner (2017) found the agendas of mainstream and "niche" (blog) media sources to be responsive to both each other and audience demands, though in a dynamical fashion contingent on the issue type. Moreover, Maier (2010) demonstrated the agendas of Web news sites (e.g., online news resources published by traditional media) to correlate highly with more traditional forms of reportage (see also J. K. Lee, 2007). On the other hand, a comprehensive analysis of the online media ecosystem by Vargo and Guo (2017; see also Guo & Vargo, 2017) found that intermedia agenda-setting effects were highly contingent on issue type, media type, and whether a story was "breaking." This effect was further demonstrated by Su and Borah (2019), who found that social media (Twitter) tend to heavily influence traditional media agendas during periods of breaking news, whereas traditional forms of media tend to dominate discussions of ongoing issues.

Baum and Groeling (2008) found that whereas television and newspaper agendas tended to be congruent, talk radio (a typically conservative medium) and blog (both liberal and conservative) agenda congruence tends to be highly conditional on how "damning" news items are for candidates comporting to their ideological and partisan leanings; this finding is in line with Groeling (2008), who found that network coverage tended to diverge from cable (Fox News) coverage in terms of reportage on polling, with networks exhibiting higher coverage of "good" polling results for Democratic candidates, and Fox News doing likewise for Republican candidates. Similarly, Gruszczynski (2015) found that coverage of political controversies in the 2012 U.S. presidential election correlated between mainstream sources and liberal and conservative blogs, especially when the controversies tended to be more prominent in the broader political environment.

Constraints on Agenda Fragmentation

Several notable characteristics of the American mass media environment may serve to limit the extent to which agenda fragmentation occurs. These include the bounded range of possible issues that typically occupy the media agenda at any time (Boydstun, 2013; Jones & Baumgartner, 2005), institutionalized media values, such as standards of newsworthiness (especially with regard to journalists' training; see Williams & Delli Carpini, 2011), and "indexing" of stories across media outlets (Cook, 2005).

Though the possible range of political issues within a democratic society is great, and as a consequence, the possible size of the media agenda is likewise, past research has shown that in reality, time and resource constraints lead the media to systematically favor a much smaller range of issues in their reportage. For example, Boydstun (2013) finds that the media tend to give disproportionate attention to a small number of issues, including foreign policy, international affairs, economic issues, and crime, among others.

That said, this bounded range of issues occupying the agenda does not, in and of itself, mean that the same issues will be reported on across media outlets; standards of newsworthiness, however, can lead to convergence in the set of issues reported on by different media outlets. Having similar standards of what is "news" across media outlets originates at least partly from journalists' risk aversity, which acts as a drive to avoid breaking nonexistent stories (Cook, 2005; see also Vargo & Guo, 2017), as well as the indexing of content between media outlets, particularly elite sources (Cook 2005; Golan, 2006). Given this, media sources today obviously operate with some degree of autonomy in choosing the issues on their agendas; however, it is unlikely that news sources will simply ignore some political issues systematically as a result of their ideological leanings, particularly if those issues are receiving a great deal of attention in competing outlets. Rather, it may be more

likely that such outlets will cover issues differently by way of framing (McCombs, 2004; Muddiman, Stroud, & McCombs, 2014).

Theory and Hypotheses

The Effect of Media Storms on Agenda Congruence

This research puts forth a two-tier theory of agenda congruence between American media sources. The first component of this theory relates to media "storms," defined by Boydstun, Hardy, and Walgrave (2014) as coverage patterns emblematic of "sudden, high, and sustained media attention to an event or issue" (p. 509). First, these media storms develop as responses to the development of a spectacular or attention-grabbing occurrence, which lead to news organizations diverting resources to covering those occurrences, and second, they are typically sustained by additional news outlets diverting resources to coverage in a pattern of imitation (Boydstun, Hardy, & Walgrave, 2014).

Importantly, the agenda-carrying capacities of media are zero-sum; that is to say, increased coverage of one issue necessarily takes space away from other potential agenda items, whether through reporting resources (journalists, money) and/or outlet space (available broadcast time). In other words, the process of an issue going from a limited amount of coverage to a high level of coverage substantially decreases media outlets' capacity to devote time and resources to other issues. As Boydstun et al. (2014; see also Boydstun, 2013) note, while coverage during "nonstorm" periods tends to be skewed toward a small set of issues, storm coverage tends to exhibit even greater skew as media sources devote substantive time and space to covering the issue(s) that brought on the storm coverage in the first place.

Beyond the zero-sum nature of available agenda space, media storms are also reflective of an issue (or issues) that demands attention. Searles and Smith (2016), for example, found that the 2008 economic collapse—surely one of the largest, most recent events that could be considered a storm[2]—brought with it homogenous media agendas across sources. During that time, both liberal and conservative cable outlets reported on economic issues at similarly high rates, while at the same time decreasing attention to other agenda items. With this in mind, I hypothesize that the presence of media storms will serve to both constrain (homogenize) within-media agendas by decreasing the diversity of topic coverage, and lead to imitation across sources as media organizations converge to covering the same news events.

I argue that media storms in and of themselves will have a homogenizing effect on intermedia agendas, with the presence of media storms indicating a large, prominent issue (or issues) in the broader sociopolitical environment and in turn leading to diverse media sources covering similar issues. As Boydstun et al. (2014) note, media agendas tend to be skewed to an extent during times of both storm and nonstorm coverage, with periods of storms exhibiting greater skew. Regardless of the source of skewed agendas, the skew itself presents a "friction" to the emergence of other issues onto the agenda space (Boydstun, Bevan, & Thomas, 2014). For those issues that typically receive low, or little, coverage, it may be a necessary condition for their emergence onto the agenda to be associated with the explosive, sustained coverage associated with media storms.

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[2] But see the COVID-19 pandemic starting in 2020.

H1:   The presence of media storms will lead to increases in intermedia agenda congruence.

The Impact of Agenda Diversity on Agenda Congruence

Second, I argue that shifts in the "typical" spread, or skew, of attention across issues have an important effect on the congruence of diverse media source agendas. While storm-type patterns of coverage by definition lead media organizations to exhibit exaggerated levels of skew in the distribution of topics being reported on, certainly other, less dramatic coverage skew patterns manifest in media reportage. For example, cyclic patterns of events—scheduled elections, seasonal jobs reports, holidays—should serve to skew the distributions of topics within media outlets, and given that these events are occurring within a shared universe of possible stories, this skew should manifest across media outlets, leading to greater congruence of agendas between media.

This spread of attention is operationalized as agenda diversity, a measure borrowed from information theory (Boydstun, Bevan, & Thomas, 2014; Tan & Weaver, 2013). Agenda diversity quantifies the extent to which media attention is evenly spread across issues. Low diversity is indicative of high skew toward one or a few issues; high diversity is indicative of more equitable coverage across issues.

The diversity of media agendas matters to agenda congruence for one primary reason: It is indicative of the state of the broader sociopolitical environment. If the agenda space of a media outlet is skewed heavily toward one issue or a small number of issues to an extent that is greater than typical (Boydstun, 2013; see also Jones & Baumgartner, 2005), this is indicative of those issues' prominence within the broader environment. This issue's prominence, in turn, means that it is likely more newsworthy and, as a result, more likely to be covered by a diverse range of media outlets. Moreover, if an issue is prominent, it is likely more cognitively salient to news audiences (Demers, Craff, Choi, & Pessin, 1989), who in turn will seek out information on said issue. If that issue is not being covered in news audiences' typical media source, they can easily go to other media sources to find the information sought (Iyengar, Norpoth, & Hahn, 2004). As a result, news outlets, being profit driven (Dunaway, 2008), have an economic incentive to cover those agenda-hogging issues that their audiences are seeking out (Gruszczynski & Wagner, 2017).

On the other hand, during periods when no issue is taking agenda space away from other issues, news outlets in a diverse, polarized media environment have incentives to cover those issues that are more salient to their specific audiences. This has been found to be the case with regard to coverage of climate change (Feldman, Maibach, Roser-Renouf, & Leiserowitz, 2012); outlets that are more left leaning (MSNBC, CNN) typically are more oriented toward coverage of climate change than the right-leaning Fox News; consequentially, liberals tend to be more concerned than conservatives about climate change (Kellstedt, Zahran, & Vedlitz, 2008).

I argue that decreases in agenda diversity increase the likelihood that media outlets will exhibit correspondence in their overall agendas. Importantly, as was previously discussed, the diversity of media agendas can be influenced by both sudden, sustained shifts in the volume of an issue's coverage (media storms) and by more typical, often cyclical, shifts in issue coverage. In the United States, elections are perhaps the best example of this,[3] being held on the Tuesday following the first Monday in November and having features

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[3] Other cyclical events likely include quarterly financial releases, holiday coverage, and so on.

synonymous with newsworthiness: conflict and drama (e.g., Iyengar et al., 2004; Patterson, 1994). Although election coverage in the United States tends to occupy a large portion of the media agenda, the elections themselves are not typically punctuations in and of themselves (though events within elections can be; see Gruszczynski, 2015).

As stated previously, I hypothesize that decreases in the diversity of media outlets' agenda space will lead to higher congruence between media outlets. I hypothesize that this relationship both will manifest when an individual media outlet's agenda becomes more homogeneous/less diverse (e.g., +liberal cable homogeneity → +liberal-conservative cable congruence) and will demonstrate an interactive effect, with greater increases in agenda congruence associated with periods when both outlets in question are showing increased agenda homogeneity.

H2a: Decreases in agenda diversity (increases in agenda homogeneity) are associated with increases in intermedia agenda congruence.

H2b: Concurrent decreases in agenda diversity between sources will interact to produce higher levels of agenda congruence between those sources.

Methods

This research uses the News Coverage Index (NCI) data set collected by the Pew Research Center's Project for Excellence in Journalism. The NCI represents a survey of the entirety of major mainstream media coverage across cable, broadcast, print, and online news outlets from 2007 to mid-2012; it uses coding for broad (first level, e.g., elections, the economy) and specific (second level, e.g., the Rod Blagojevich corruption scandal) topic areas, as well as the prominence of news stories (above the fold, within first 5 minutes of broadcast) and their length. For network news, the NCI data set was gathered by coding the entirety of both morning and evening 30-minute news broadcasts on ABC, CBS, and NBC. For cable news, the NCI gathered two 30-minute afternoon broadcasts, rotating among CNN, MSNBC, and Fox News, as well as early evening (6 p.m.) and primetime (11 p.m.) coverage from all three of these cable networks; slightly lower sampling was used for MSNBC (60 min/night) than Fox News and CNN (90 min/night) because of MSNBC's lower viewership numbers ("News Coverage Index Methodology," 2012). Importantly, because this research computes proportions of coverage volume across these sources, the slightly lower sampling rate should be less of an issue than it would be if only the raw coverage volume numbers were used in the analyses.

In line with Searles and Smith (2016), this research uses NCI data coding for stories in the major U.S. broadcast (ABC, CBS, NBC) and cable outlets (CNN, MSNBC, Fox News), inclusive of all included programs in those sources. Importantly, I define liberal sources as including CNN and MSNBC and the conservative source as Fox News. Obviously, a wider range of liberal and conservative sources exists in the broader media ecology, and the measurement of media slant is still contested (e.g., Groseclose & Milyo, 2005; Jamieson, 2012); however, as of 2020, 93% of Republicans and Republican-leaning adults cited Fox News as their main source of

political news, whereas 79% and 95% of Democratic and Democratic-leaning adults cited CNN and MSNBC as such, respectively.[4]

Because I am primarily concerned with attention to broad topic domains rather than specific attributes of those topics, this research makes use of the broad story topics, such as U.S. foreign policy, the economy, the environment, and defense issues.[5]

To measure variability in the proportion of attention given to each topic area across cable and broadcast news sources, the data were aggregated into rolling seven-day weekly (e.g., January 1–7, 2007; January 2–8, 2007, etc.) percentages of attention across the issues. Within each rolling window, the amount of time (measured in seconds) devoted to each topic across all programs within each source was summed and divided by the total amount of time given to all topics during each rolling week to create the proportion of attention devoted to each topic by the media sources in question.

To measure intermedia agreement, each pairing of media sources was correlated across all issues within each seven–day window; thus, each time window resulted in a Pearson's r correlation coefficient for the liberal–conservative cable pairing, the liberal cable–network pairing, and the conservative cable–network pairing across all issues. This serves to create an index of agreement between sources across all the issues in question, rather than examining how changes in the attention given to each individual issue are reflected between sources. The correlation between the different sources' agendas is the primary dependent variable in this research. Importantly, because the variance of Pearson's r is conditioned on the value of its mean, especially at high and low values of r, Fisher's z transformation was first applied to the correlations between sources by taking the inverse hyperbolic tangent of r (see Bartlett, 1993).

This research makes use of measures of media diversity to capture the extent to which a single or small number of issues dominated each source's agenda. Specifically, Shannon's h index was computed within each seven-day window (see Boydstun, Bevan, & Thomas, 2014; but see Tan & Weaver, 2013 for other measures of agenda diversity). Shannon's h is computed using the following equation:

$$h = -\sum p_i \, ln \, p_i \, .$$

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[4] See the Pew Research Center (2020) report, "Americans' Main Sources for Political News Vary by Party and Age."

[5] The topics in the NCI data include government agencies/legislatures, campaigns/elections/politics, domestic defense/military issues, court/legal system, crime, domestic terrorism, business, economy/economics, environment, development/sprawl, transportation, education, religion, health/medicine, science and technology, race/gender/gay issues, immigration, additional domestic affairs, disasters/accidents, celebrity/entertainment, lifestyle, sports, media, U.S. miscellaneous, U.S. foreign affairs, and non-U.S. foreign affairs. Two categories were removed from the analysis because of their status as "catch-alls" for miscellaneous topics: "other domestic issues" and "U.S. miscellaneous." Exclusion of these categories had an unsurprisingly negligible effect on subsequent analyses, given that they only made up 2.1% and 3.7% of the total amount of time given to all issues, respectively.

Interpretation of Shannon's *h* is such that low levels of *h* indicate lower diversity (fewer items taking up more agenda space), and higher levels indicate higher diversity (agenda space spread more evenly across agenda items).[6] This measure is appropriate for measures of agenda diversity in that it is more sensitive to incremental shifts in the dispersion of attention across issues, as compared with the inverse Herfindahl diversity measure (Boydstun, Bevan, & Thomas, 2014), another popular measure of diversity.[7]

The presence or absence of media storms was measured using a dichotomous variable (1 = storm present).[8] In line with Boydstun et al. (2014), a media storm was coded as present when an issue area received a 150% spike in the daily percent change of media attention and, additionally, occupied 20% or more of the overall agenda space for that media source type over some consecutive period.

Results

Examining the distributions of the correlations between outlets revealed positively skewed distributions of *z* values, with periodically high levels of congruence between sources. The median correlation between conservative and liberal cable outlets was $z = 1.29$ (corresponding to $r = .86$; median absolute deviation = .573),[9] broadcast and conservative outlets $z = 0.99$ ($r = .76$; *mad* = .451), and broadcast and liberal outlets $z = 1.2$ ($r = .83$; *mad* = .475). On the whole, these paired media sources tend to be fairly well correlated in coverage given to a wide range of issue areas. That said, a great deal of variability is also present in the data, ranging from effectively $r = 0.0$ at the low end (in the case of broadcast-conservative cable sources) to $r = .99$ for all three source pairings.

Figure 1 presents the seven-day rolling (*z*-transformed) correlation coefficients between the media agendas of broadcast, liberal cable, and conservative cable outlets over time. As can be seen in all three panels of the graph, the greatest period of intermedia agenda congruence was during the second half of 2008, when both the global financial crisis and the U.S. presidential election were receiving a high level of media coverage across sources. That we see high levels of agenda congruence during this period is in line with Searles and Smith's (2016) finding of high congruence between sources in the level of economic issue coverage during this period. Interestingly, the highest increase in congruence occurred between liberal and conservative cable sources, which runs counter to conventional wisdom on between-source agenda dynamics; it could be that although Fox News, CNN, and MSNBC span a large ideological space (particularly comparing Fox with the latter two), similarity in format compared with broadcast news—that is, news shows are not shown 24/7—means that their coverage patterns are similar.

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[6] The number of possible agenda items in the data used in this article was constant (e.g., "environment" was present as 0% during times with no environmental coverage, rather than being omitted from the data), and thus the unstandardized form is appropriate.

[7] Both measures were calculated in this study; the two diversity indices were correlated at $r = .93$ across sources.

[8] In these data, there were no instances in which more than one media storm was present in a source's coverage at a single point in time.

[9] Transformation of *z* scores back to standard Pearson's *r* coefficients was undertaken by taking the hyperbolic tangent of *z*.
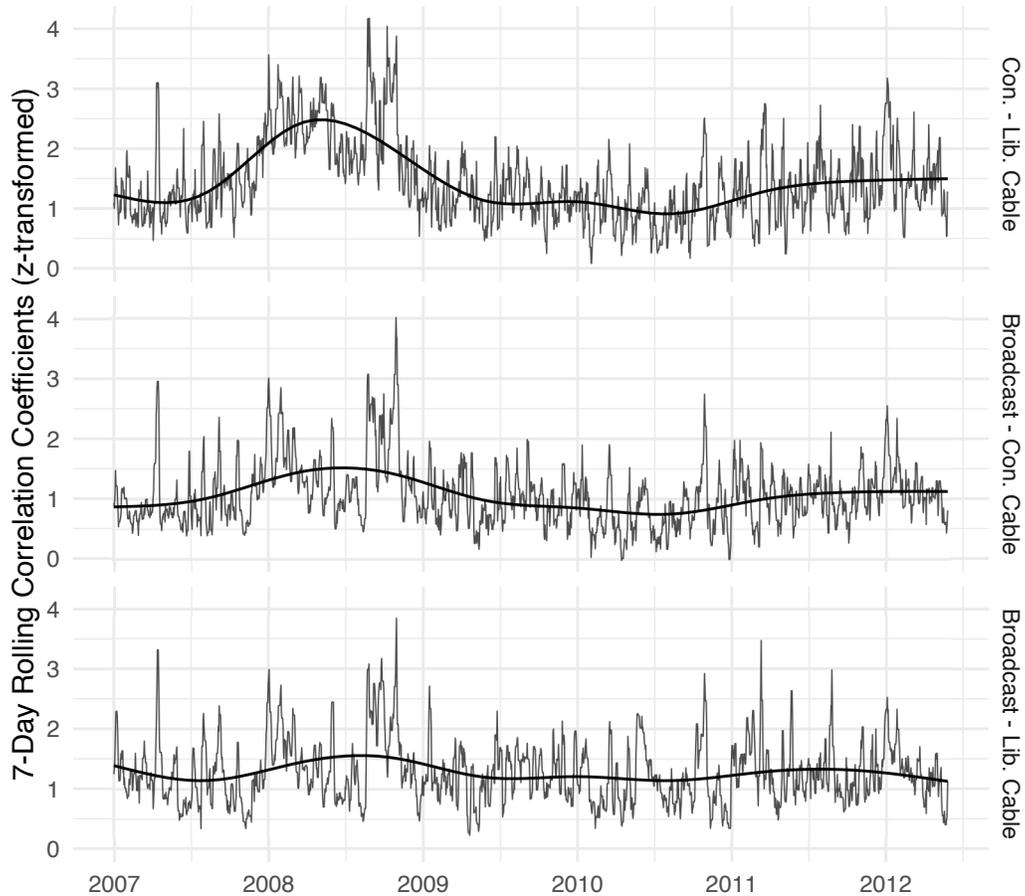
Figure 1. Correlations between media agendas, 2007–2012.

Other large spikes in agenda congruence between sources included the U.S. presidential primary period in early to mid-2008, the 2010 congressional midterms, and the killing of Osama Bin Laden in early 2011. Other than these large events, one can also easily see that congruence in agendas between these sources was also very highly variable, with frequent shifts from low to high congruence on a day-to-day basis during this period. Though this is only a visual examination of intermedia agenda congruence, it appears clear that the level of agreement in issue coverage across these sources was neither consistently high nor low, and additionally could exhibit higher congruence (at least qualitatively) when big events occurred in the broader sociopolitical environment.

To provide further context regarding this point, Figure 2 plots the relationship between the maximum amount of airtime[10] given to each issue and *z*-transformed correlation coefficients between each source pairing for each issue included in this data set. Note that a logarithmic scale is used on the x-axis (maximum weekly airtime in minutes); because of typical attentional skew across topics in media coverage (Boydstun, 2013), taking the log of airtime is necessary to linearize the relationship between time and media source correlations.

As can be seen, topics that feature a high amount of coverage—campaigns, disasters, the economy, and other high-volume issues—tend to show much higher correlations between these media outlets than those topics that tend not to receive much coverage volume at all. This lends further support to the idea that topics with a greater tendency to receive high volumes of coverage tend to occupy agenda space that might otherwise be devoted to other topics. Moreover, because of their nature, high-volume issues such as campaigns, disasters, terrorism, crime, and foreign affairs all tend to exhibit more newsworthy characteristics than do topics of education, development, and transportation, to name a few (e.g., Iyengar et al., 2004; A. M. Lee & Chyi, 2014). OLS models regressing these issue correlations (z) on log-transformed airtime are similar when considering the conservative–liberal cable pairing ($b = 0.86$, $p < .001$), the broadcast–conservative cable pairing ($b = 1.04$, $p < .001$), and the broadcast–liberal cable pairing ($b = 1.00$, $p < .001$). Although the amount of agenda space typically occupied by each of these issues does not in and of itself signify the presence of a media storm (though in issues such as terrorism, disasters/accidents, and crime, it likely does), that the high volume issues tend to show such high correspondence between source types at least suggests some level of support for both H1 (media storms will lead to higher levels of agenda congruence) and H2 (decreases in agenda diversity will lead to higher levels of agenda congruence).

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[10] This relationship was also tested for the average weekly amount of time given to each issue; the results were not substantively different.
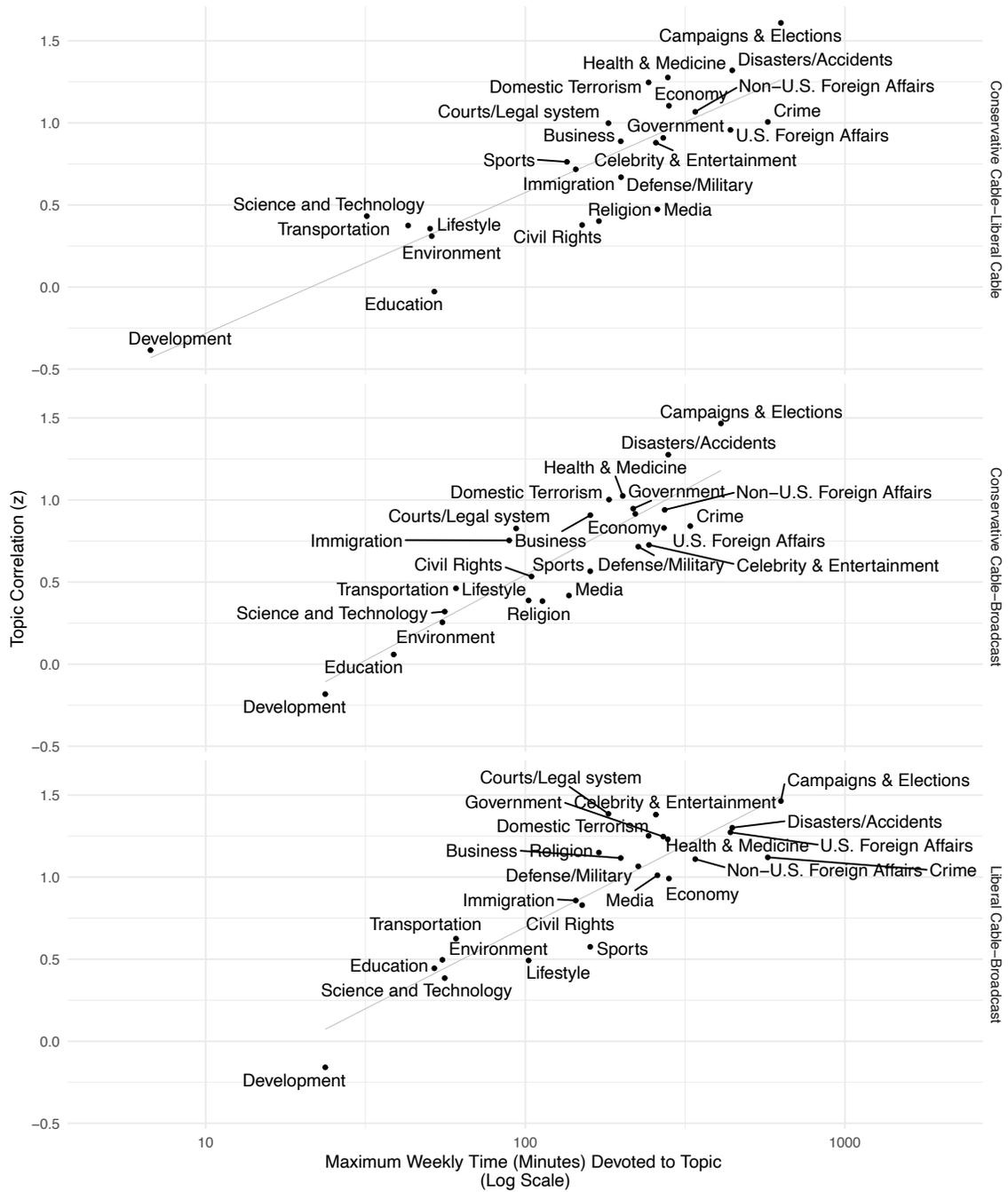
Figure 2. Maximum topic coverage volume and topic correlations.

Turning to direct tests of H1, Table 1 presents tests for the effect of media storms on agenda congruence across three models. Model 1 regresses conservative and liberal cable congruence on the presence of media storms in either conservative or liberal outlets. Interestingly, no significant effect was found for media storms in either conservative ($b = 0.077$, $p > .05$) or liberal cable news ($b = 0.075$, $p > .05$). Turning to Model 2, which regressed agenda congruence between conservative cable and broadcast networks on the presence of media storms in those domains, there was no effect of media storms in conservative cable coverage on conservative–broadcast congruence; however, media storms occurring in broadcast coverage had a positive and significant effect on conservative–broadcast congruence ($b = 0.413$, $p < .001$). This is an especially interesting finding, and in the opposite direction of previous research, which found that partisan news tended to set mainstream sources' agendas when it came to breaking news, perhaps because of a lower newsworthiness threshold among partisan sources (Vargo & Guo, 2017). Although this finding runs contrary to that research, it could be that the conservative cable news source in this research had a higher threshold of what constituted the news than did the broader range of partisan sources online.

Table 1. Regressing Agenda Correlations on Media Storms.

	Model 1	Model 2	Model 3
	Con. Cable–Lib. Cable (z)	Con. Cable–Broadcast (z)	Lib. Cable–Broadcast (z)
Con. Cable Storm	0.077 (0.034)	0.057 (0.034)	—
Lib. Cable Storm	0.075 (.0548)	—	0.052 (0.041)
Broadcast Storm	—	0.413*** (0.098)	0.278*** (0.095)
AR(1)	0.927** (0.008)	0.932*** (0.008)	0.933*** (0.008)
Intercept	−0.011 (0.077)	−0.010 (0.064)	−0.008 (0.062)
R^2	0.86	0.87	0.87
df	1,968	1,968	1,968

Standardized coefficients reported. Standard errors in parentheses. Models estimated using AR(1) autocorrelation structure.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Model 3 regressed liberal cable–broadcast congruence on media storm coverage in the liberal and broadcast sources and found a similar pattern, with no relationship between media storms in liberal media coverage ($b = 0.052$, $p > .05$) and a positive and significant relationship between broadcast media storms and liberal cable–broadcast congruence ($b = 0.278$, $p < .001$). In sum, it appears that H1, which stated that media storms would lead to greater congruence across source types, holds only when broadcast sources exhibit a rapid shift toward breaking news that is sustained over time.

Discussion now turns to H2, which posited that the level of agenda congruence between sources is related to the diversity of issues present within each source's agenda. To restate the rationale underlying this hypothesis, the spread of media attention across issues acts as an indicator of the state of the exogeneous sociopolitical environment: When agenda diversity is low (fewer issues taking up more agenda space), this is reflective of larger issues in the environment, and thus, these media sources will cover those issues correspondingly. Conversely, when agenda diversity is high (attention spread across more issues),

this is reflective of a sociopolitical environment with few or no "big" issues, which will lead to these diverse sources catering to their audiences.

Figure 3 plots the relationship between agenda diversity and agenda congruence, the former measured using Shannon's h, and the latter z-transformed Pearson's product-moment coefficients measuring correlations between each source pair used in this research. Across the source pairs, there is a strong relationship between diversity and agenda congruence. Liberal ($b = -0.698$, $p < .001$) and conservative agenda diversity ($b = -0.728$, $p < .001$) are both negatively and significantly related to agenda congruence between conservative and liberal cable outlets, meaning that for both source types, when fewer issues occupy more of the agenda, congruence is significantly higher than when attention is spread across more issues. This relationship also manifests when examining congruence between broadcast and conservative cable sources; conservative cable ($b = -0.689$, $p < .001$) and broadcast ($b = -0.623$, $p < .001$) agenda diversity are both negatively and significantly related to broadcast–conservative cable agenda congruence. Finally, liberal cable ($b = -0.504$, $p < .001$) and broadcast ($b = -0.781$, $p < .001$) are also negatively and significantly related to broadcast–liberal cable agenda congruence. It appears from these analyses that H2 is supported, though a more fully specified model will be discussed in the next section to test H2 in full models that include the effect of media storms.
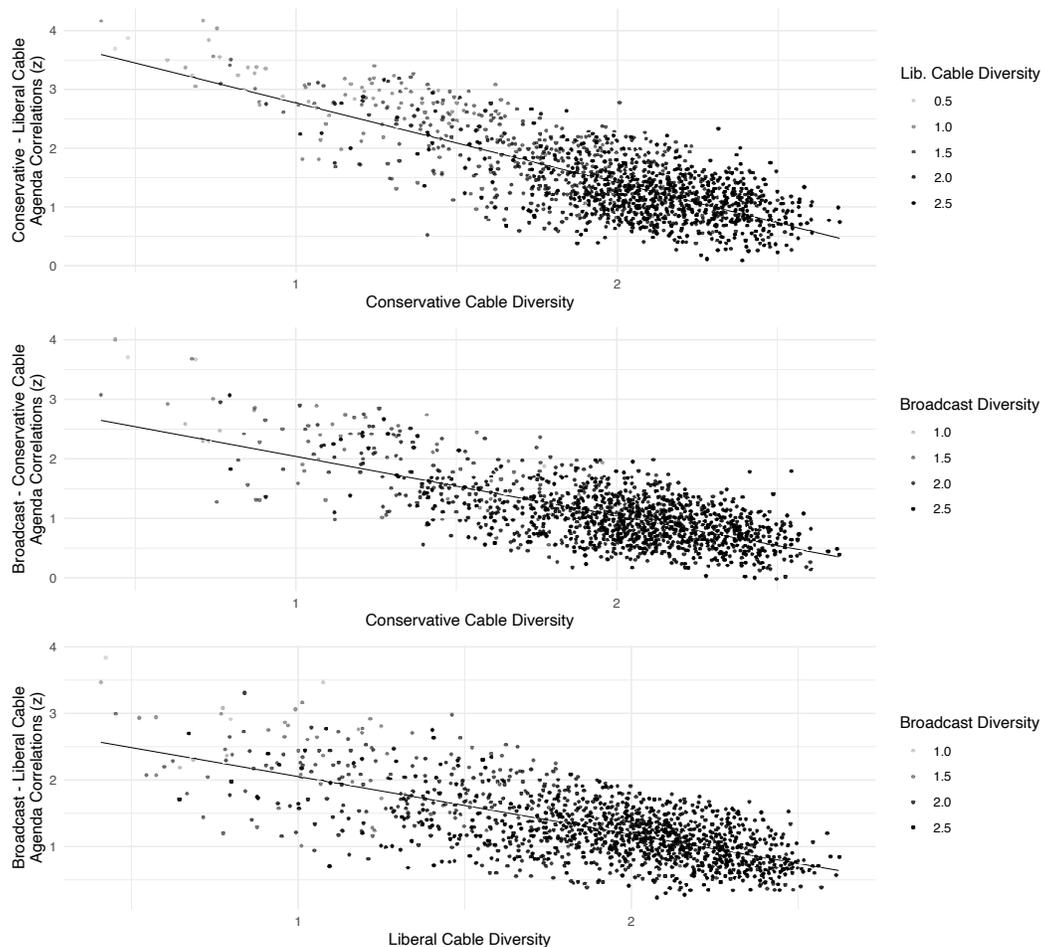
Figure 3. Agenda diversity and agenda correlations.

The last set of analyses, shown in Table 2, specifies full regression models accounting for the effect of both media storms and within-source agenda diversity on cross-media agenda congruence. Regressing conservative–liberal agenda congruence (Model 4) on media storms again showed nonsignificant effects for both conservative (b = 0.013, p > .05) and liberal (b = 0.011, p > .05) media storms. As before, broadcast media storms showed a positive and significant effect on conservative–broadcast congruence (Model 5; b = 0.287, p < .001), with no similar effect for conservative media storms (b = 0.027, p > .05). A similar effect was found for broadcast media storms on liberal–broadcast congruence (Model 6; b = 0.179, p < .05), with no effect for liberal media storms on congruence between liberal cable and broadcast sources (b = 0.027, p > .05).

Table 2. Regressing Agenda Correlations on Media Storms and Agenda Diversity.

	Model 4	Model 5	Model 6
	Con. Cable–Lib. Cable (z)	Con. Cable–Broadcast (z)	Lib. Cable–Broadcast (z)
Hypothesis 1			
Con. Cable Storms	0.013 (0.040)	0.027 (0.031)	—
Lib. Cable Storms	0.011 (0.049)	—	0.027 (0.036)
Broadcast Storms	—	0.287*** (0.090)	0.179* (0.084)
Hypothesis 2			
Con. Cable Diversity (h)	−0.513*** (0.050)	−0.234*** (0.040)	—
Lib. Cable Diversity (h)	−0.560*** (0.051)	—	−0.354*** (0.041)
Broadcast Diversity (h)	—	−0.693*** (0.056)	−0.635*** (0.057)
Hypothesis 2a			
Con. Cable * Lib. Cable Diversity (h)	0.344*** (0.069)	—	—
Con. Cable * Broadcast Diversity (h)	—	0.316*** (0.071)	—
Lib. Cable * Broadcast Diversity (h)	—	—	0.385*** (0.066)
AR(1)	0.832*** (0.013)	0.888*** (0.011)	0.888*** (0.010)
Intercept	−0.044 (0.032)	−0.028 (0.036)	−0.035 (0.034)
R^2	0.885	0.891	0.901
df	1,965	1,965	1,965

Standardized coefficients reported. Standard errors in parentheses. Models estimated using AR(1) autocorrelation structure.
* $p < .05$. ** $p < .01$. *** $p < .001$.

This unidirectional relationship between media storms and agenda congruence is telling, given that the same pattern manifested in both earlier models accounting only for media storms and these models that include both media storms and agenda diversity as predictors. It could be the case that because the broadcast media sources included in these analyses represent more traditional media forms, they have a greater capacity to set other sources' agendas; this is to say, because their newsworthiness standards are more stringent than those of the partisan cable sources, when they shift into storm coverage patterns, it is indicative of a major social or political issue that demands coverage.

Discussion now turns to the effect of agenda diversity on intermedia agenda congruence (H2). Recall that H2 posited that decreases in agenda diversity between sources would lead to increased agenda congruence, both when taken in isolation and interactively. Although this was shown in isolation in Figure 3, it also appears to be the case when examining congruence between conservative and liberal outlets in these models; decreases in both conservative ($b = −.513$, $p < .001$) and liberal cable ($b = −.560$, $p < .001$) agenda diversity are negatively and significantly associated with conservative–liberal congruence. In other words, as either conservative or liberal agendas become less diverse (e.g., fewer agenda items occupying greater agenda space), these sources tend to correlate in their overall issue coverage, controlling for the effects of media storms (which were nonexistent in Model 4).

This relationship posited in H2 holds for congruence between conservative cable and broadcast outlets (Model 5), with both conservative cable ($b = -.234$, $p < .001$) and broadcast ($b = -.693$, $p < .001$) agenda diversity negatively and significantly associated with agenda congruence between the pair of source types. The relationship likewise holds for the liberal cable–broadcast congruence relationship (Model 6); decreases in both liberal cable ($b = -.354$, $p < .001$) and broadcast ($b = -.635$, $p < .001$) are significantly associated with increases in congruence between the outlet types.

What is especially interesting about these relationships is the magnitude difference in the standardized coefficients; although decreases in agenda diversity within sources are associated with increases in congruence between sources, the effect is much larger for broadcast news sources than for either liberal or conservative cable sources. It could be the case that, as with the asymmetrical relationship between media storm coverage and agenda congruence, the broadcast sources have more capacity to shape the broader media agenda than do cable sources. This is definitely a relationship that demands further exploration in future research, given that it runs contrary to findings across online news sources, which show that partisan sources tend to set the traditional media agenda on breaking issues (e.g., Vargo & Guo, 2017) and on sensationalistic news stories (e.g., Gruszczynski & Wagner, 2017).

Finally, the interactions between source diversity shown in the Models 4–6 columns test the hypothesis (H2a) positing that agenda diversity will act interactively in producing higher levels of intermedia congruence. In other words, it was hypothesized that when both of two sources are exhibiting lower levels of agenda diversity (e.g., more attention spread across fewer issues), diversity is multiplicatively associated with higher correspondence across media agendas.

For each model predicting intermedia agenda congruence, the interactive relationship between source type is positive and significant ($b = .344$, $b = .316$, and $b = .385$ for conservative–liberal, conservative–broadcast, and liberal–broadcast, respectively; $p < .001$ for all). Because interactions between continuous variables can be difficult to interpret numerically, Figure 4 plots the predicted interactive relationships between different levels of agenda diversity and agenda congruence for each outlet type pairing.
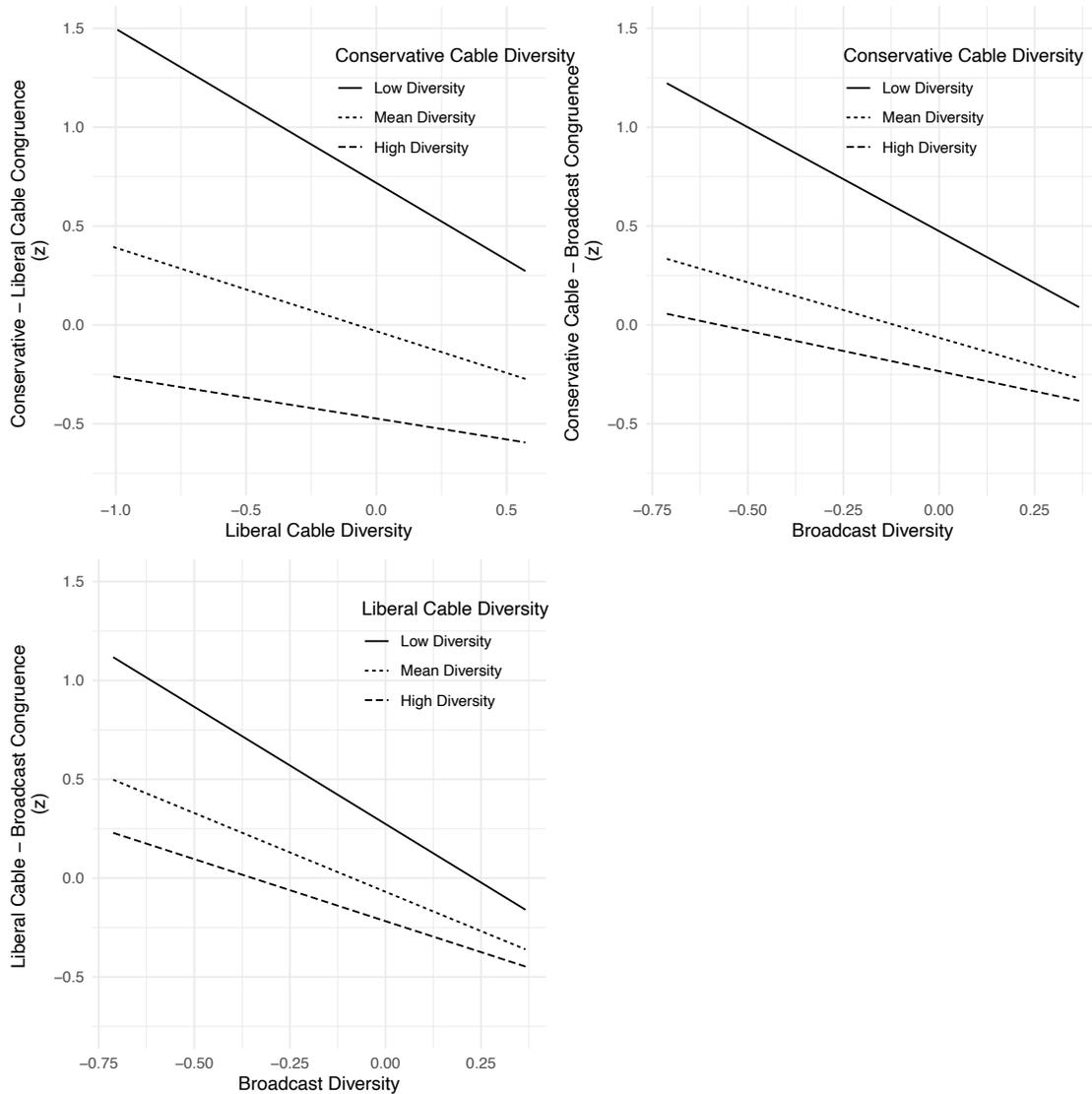
Figure 4. Interactions between agenda diversity and congruence.

The interactions in Figure 4 demonstrate the multiplicative effect of decreases in agenda diversity on intermedia agenda congruence. In each of the panels, low levels of diversity tend to be associated with higher correlations between sources; however, it is when both sources are demonstrating lower diversity in their agendas that the highest levels of agenda congruence manifest. This lends support to H2a and is evidence that although a diverse media has the capacity to cover issues oriented toward niche audiences, niche coverage patterns are constrained by the larger sociopolitical context in which these media sources operate. Put another way, sources have incentives to cover the issues their audiences demand, but when

big issues manifest in the broader environment, diverse media audiences likely demand coverage of similar issues (A. M. Lee & Chyi, 2014).

Discussion

The primary motivating force driving this research was the question of whether a diverse media has brought on fragmentation or congruence in agendas, and to what extent the broader sociopolitical environment can serve to constrain the agendas of disparate media sources. As has been shown in the results of this research, and is so often the case, the answer is much more nuanced than yes or no—but rather, that it depends.

Interestingly, the presence of media storms had only consistent effects on intermedia agenda congruence when the storms were present in broadcast media coverage. There was no such relationship between storm coverage in either conservative or liberal sources and intermedia agenda congruence. In other words, during periods when network news outlets dramatically increased, and then sustained, coverage of an issue, both liberal and conservative sources tended to converge toward coverage of that issue. When those partisan cable sources exhibited storm coverage, however, there was no systematic increase in agenda congruence between sources as a result. As discussed previously, this runs somewhat contrary to recent research on coverage patterns of online news, which found that partisan media tend to set the agenda of traditional media with regard to breaking stories, either because of lower journalistic standards (Vargo & Guo, 2017) or a proclivity to covering scandal (Gruszczynski & Wagner, 2017).

The most consistent finding in this research was that homogeneity in within-media agendas tends to drive intermedia agenda congruence. For example, when the distribution of attention was skewed to a higher degree among liberal cable sources, the correlations between liberal cable sources' agendas and both conservative cable and broadcast sources were significantly higher. This effect held across media source pairings in the analyses—analyzed both in isolation and in models controlling for the effects of media storms on intermedia agenda congruence.

The effect of agenda diversity on intermedia agenda congruence was even greater when considering the interactive effects of each source pair's level of agenda diversity. For example, when considering agenda congruence between liberal and conservative cable agendas, those periods during which both sources exhibited lower diversity in their agendas were associated with greater correspondence in their agendas, and vice versa.

In sum, this analysis demonstrates the importance of understanding the ways in which the modern media do and do not resemble new forms. It is undoubtedly true that the media of today are not facsimiles of the media from 50, or even 20, years ago. With increased incentive to cater to more homogeneous audiences comes behavior that would not have been economically expedient during the golden age of the mass media (e.g., Sheppard, 2007). At the same time, media sources do not operate in a vacuum. Pressing issues in the broader sociopolitical environment require coverage—regardless of liberal or conservative leanings—and news sources that fail to cover emergent issues will likely find their audiences going elsewhere for their news.

As has been shown, it is important to account for the broader agenda space when examining congruencies (or incongruencies) between media agendas. Though these findings help to illuminate the question of agenda fragmentation among traditional televised media sources, we know less about congruence among newer forms of media and these traditional outlets' place within them. For example, do the agendas of the online versions of these media outlets exhibit the same intermedia agenda dynamics within an online context driven by social interactions? Do wholly online news sources—for example, Huffington Post, BuzzFeed, and Axios—act in similar ways to ABC, Fox, and MSNBC? These are important questions to ask as research further explores the dynamics of intermedia agendas in the new communication ecology.

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