# Developing the 'News Niche' as an Audience-Level Indicator of Fragmentation: A Theoretical Application of Community Detection Algorithms

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| Abstract: | Ideological fragmentation in news audiences has been studied by looking at either individual's media selections, or by observing aggregate patterns of attention to news organizations. While the former set of studies typically shows evidence of fragmentation, the latter generally does not. This study engages with the mixed evidence on audience fragmentation through multilevel conceptualization and analysis. We develop a theoretical approach that builds upon the classic notion of niche news, and we then test this framework with multilevel survey data from the United States (N = 1,965). While results reveal three distinct-but-overlapping audience niches, we do not find support for clear fragmentation along ideological lines. Instead, news consumption within a niche reflects competition and symbiosis among news organizations, highlighting the influence of system-level factors, rather than individual ideology, on partisan news selection. Results are discussed in light of our current knowledge about audience fragmentation in the United States. |
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# Developing the News Niche as Multilevel Phenomena: A Theoretical Application of Community Detection Algorithms

The prevalence of partisan media raises concerns about social fragmentation, and not without good reason: Ideological news has been connected to sectarianism (Finkel et al., 2020) and a communication environment in which facts are contested (Waisbord, 2019). While much of the literature on this subject has focused on the psychology of media selection (e.g., Garrett, 2009; Knobloch-Westerwick & Meng, 2009; Stroud, 2011), a parallel line of work has examined system-level patterns in audience dispersion (Fletcher & Nielsen, 2017; Majó-Vázquez et al., 2019; Mukerjee et al., 2018; Webster & Ksiazek, 2012; Weeks et al., 2016). These latter studies find that audiences are not as fragmented as previously assumed, a conclusion that contradicts claims based on the study of individual media preferences, which show, for example, that most partisans (60%) trust and pay attention to attitude-consistent news while avoiding 'mainstream' outlets (Jurkowitz et al., 2020; see also Flaxman et al., 2016).

One limitation with the audience approach is that it erroneously assumes that structural fragmentation is an indicator of ideological fragmentation. That is, ideological fragmentation may not be indicated by audience network structures. We argue that to fully interrogate the nature of fragmentation, parsing the difference between individual, group, and system-level effects is necessary (Author, YYYY; DeVito, 2017; Ohme & Mothes, 2020). This study addresses this problem by employing multilevel analysis via 'community detection' algorithms that cluster news organizations based on shared audience (e.g., Mukerjee, 2021; 2022), building upon recent studies that examine how media outlets cluster together along some shared trait (Del Vicario et al., 2017; Schmidt et al., 2017).

We forward theory in this area by revisiting and elaborating upon an older concept—*the news niche*. The concept of a news niche isn't novel—Stroud's (2011) now classic *Niche News* examined selective exposure in the United States in the mid-2000s. But our approach also borrows from the audience-centric approach (Fletcher & Nielsen, 2017; Ksiazek, 2011), which looks at the shared audience for a given set of news organizations. We propose a framework that bridges these separate-but-related literatures by conceptualizing the news niche as an audience-level characteristic that shapes an individual's place within the news audience. Drawing on open-ended survey data ($N$ = 1,965; 17 Waves), we develop a research design that parses the influence of political ideology on news selection at various levels of analysis. We then test these influences in a multilevel framework.

**Audience Overlap and Methodological Innovation**

*Audience overlap* or *duplication* is concerned with the tendency for the audience of one program to be 'duplicated' in another. This approach views news audiences as the interaction between system-level structures and individual preferences (Fletcher & Nielsen, 2017). Hence, scholarship in this area analyzes social and political division in the form of information silos created by the high-choice media environment (Prior, 2007). In contrast to selective exposure theory, which looks at personal motivations for media consumption (e.g., Knobloch-Westerwick & Meng, 2009), audience overlap studies are concerned with macro-level patterns of attention and employ concepts from network science. The advantage of this method is that it enables researchers to observe the extent to which audiences are concentrated or dispersed.

The overlap approach has uncovered several important conclusions. First, macro-level patterns of shared attention to news do not show evidence of ideological silos (Fletcher & Nielsen, 2017; Webster & Ksiazek, 2012). Citing both large-scale datasets of online linking

behaviors (e.g., Mukerjee et al., 2018) and survey responses (e.g., Weeks et al., 2016) there is considerable evidence of heterogeneous news consumption, resulting in a substantial degree of audience overlap across media channels. A second development clarifies these findings. Scholars have devised techniques for filtering the otherwise noisy data associated with larger sample sizes, revealing a core, 'backbone' structure of news audience attention (Majó-Vázquez et al., 2019; Mukerjee et al., 2018). The defining feature of the core network is a power law distribution, where a small set of legacy media organizations hold a majority share of the market, and the rest compete for small audience shares along the 'long tail' of the distribution. It follows that the number and scope of dominant organizations will vary from system to system, which implies that structural features of a media system—and not the ideologies of individuals alone—affect the degree of audience fragmentation (Fletcher & Nielsen, 2017).

**Network Position and Community Detection**

One limitation with the overlap approach is that scholars equate structural fragmentation and ideological fragmentation. This assumption represents a major oversight, as most studies that employ network analysis do not account for the editorial, ideological, or other possible organizational features that influence the valence of media content. To address this gap, recent studies have developed methods for accounting for a) the ideological valence of news organizations within the network and b) observing individuals' position within that network. Positionality—otherwise defined as *attention centrality*, a person's news selections relative to the center of the news attention network— is one factor that explains the overall ideological valence of one's news habits (Author, YYYY). This methodological innovation centers on characterizing individuals according to their roles within a broad network, bridging the gap between audience-level and individual-level studies. While media scholars tend to think of partisan news as

'peripheral' as compared to an imagined 'center' of politically neutral media, findings from positionality studies show that media outlets at the center of the attention network also carry ideologically slanted content, which means that even people with a more 'central' positionality are exposed to a healthy dose of partisan news. For example, Fox News often amplifies radical right-wing talking points (Benkler et al., 2018) and their position as a dominant force in the market means that people are exposed to ideological content without self-isolating or traveling to the extreme edges of their information environment.

This study further extends work on positionality by connecting to emerging trends in community detection algorithms (Del Vicario et al., 2017; Mukerjee, 2021, 2022; Schmidt et al., 2017). The underlying assumption is that media outlets belonging to the same structural cluster reflect a 'community' that shares some characteristic distinct from the rest of the network. This phenomenon has been observed for online news in the United Kingdom, where people formed two groups based on patterns of attention to news about Brexit (Del Vicario et al., 2017) as well as on Facebook, as users tend to cluster into communities based on regular visits to a small subset of news outlets (Schmidt et al., 2017). However, only recently have scholars identified reliable clustering algorithms for news audience projection networks (Mukerjee, 2021). In addition, there is opportunity for theory building in this area, as scholars have moved beyond the observation of structure alone, and now argue for applying concepts of audience behavior to community detection. In India, for example, so-called 'reading publics' form based shared motivations, language, and identity (Mukerjee, 2022). This study applies this logic to the question of ideological fragmentation as it manifests at multiple levels of the news audience.

**Developing the News Niche as Multilevel Phenomena**

Findings from multiple national contexts find that across different media systems, only a small percentage of citizens are in an ideological filter bubble (Arguedes et al., 2022; Fletcher & Nielsen, 2017). However, it is premature to conclude that these results provide evidence against fragmentation; rather, it is possible that fragmentation occurs in other ways that align more closely with the networked relations among individuals and media organizations. Audiences are now displaced from traditional programing as media consumption is now facilitated by networked connections and algorithmic curation of content (Thorson & Wells, 2016). These systems have an 'actuarial' dimension in that one individual's choices may affect the future selection of content for some similar individual (DeVito, 2017). This audience dynamic has important implications for audience fragmentation, as selective and curatorial processes may produce distinct audience segments, even if those segments do not manifest along political lines.

To account for these developments, and to address theoretical shortcomings with current approaches to audience fragmentation, we introduce an expanded application of the concept of the news niche. The idea of a news niche is not new. For example, Stroud (2011) conceptualized it as the product of individual-level tendencies toward partisan selective exposure and their interactions with the increasing competition and segmentation of media channels. Borrowing from this approach, we assume that a news niche is the outcome of market forces and people's positionality within a media system. We also build on past uses of the concept by incorporating a sociotechnical dimension: News niches are constituted by social and algorithmic processes of content curation in online spaces. Thus, news niches arise not only from the relations between organizations and individuals, but also from the technological infrastructure of major news platforms, including search engines, aggregators, news apps, and social media sites.

This conceptualization of the news niche allows for an audience that is unified by a shared experience but is also fragmented by the qualitative patterns of attention to unique sets of news organizations. Niches can be characterized by a high degree of audience overlap (or shared attention) within and between each niche. That is, while audiences may not be entirely fragmented along ideological lines (Fletcher & Nielsen, 2017; Webster & Ksiazek, 2012), we should be able to identify segments within the overall attention network in which individuals and organizations are tied together via the general characteristics of the network composition. Those ties create media experiences shared by those within the same audience niche, and by default these experiences will be more similar relative to those outside of the niche. Thus, the current study takes as its starting point the question of whether audience niches of this nature exist, and, if they do, seeks to understand their role in creating slanted information environments.

**The News Niche, Algorithms, and Individuals**

Two factors shape an individuals' news niche: Motivations for attending to news; and the routinized patterns of media use on various devices and channels. Politically motivated selective exposure is a well-documented phenomenon, and work in this area has coalesced around two broad conclusions. First, people select news and information they believe will align with their 'priors,' a tendency that arises from a psychological bias known as the confirmation bias (Knobloch-Westerwick & Meng, 2009). Second, people do not necessarily avoid politically incongruent media (Garrett 2009; Garrett & Stroud, 2014), a phenomenon known as non-avoidance. Thus, while people prefer content that reaffirms their preexisting beliefs, they also consume a fair amount of incongruent media, as well, perhaps due to environmental factors such as access or convenience.

Scholars have developed the concept of *media repertoires* to understand these environmental factors and how individuals navigate them. When faced with information abundance, people may tailor their routines for different purposes (Taneja et al, 2012) or gravitate towards specific platforms (Kim, 2014). Thus, people have a good deal of agency when it comes to determining their own routine. Still, systemic factors do shape the 'menu' of available options, leading to clear patterns in media use. One assumption guiding theory in both literatures is the notion that people make active decisions when consuming news. However, technological developments have raised questions about the limits of individual agency over the news content they see. Many social media sites such as Facebook and news aggregators such as Google News or Apple News use algorithms to filter and curate news content to their users (DeVito, 2017; Joris et al., 2021; Thorson et al., 2019). While much attention has been given to how these algorithms personalize content for people, less attention has been paid to the role of *other people's behavior* in informing their selection criteria. In fact, a person's social connections are one of the top criteria for Facebook's selection algorithm (DeVito, 2017; Thorson et al., 2019).

Accordingly, we argue that selection algorithms have an 'actuarial' dimension: The outcome (i.e., the selection of content) depends in part on the actions of other people who are similarly classified in terms of news preferences. For example, if a person selects a story from Fox News, and also selects a second story from Breitbart News, online platforms record this link and consider it not only for that user, but also for other users who subsequently select Fox News. The more people who co-select stories from these organizations, the stronger the link becomes over time, and the more likely a given user will be to receive a recommendation for Breitbart after having selected Fox. The selections of other individuals may shape the ideological valence

of potential selections for others with similar news interests (Ohme & Mothes, 2020). Thus, the experience of any individual will be influenced by others who fit a similar behavioral profile.

**Niche and Organizations**

As we have shown, work on both selective exposure reveals that audiences are not as ideologically fragmented as previously believe. We argue that the within niche patterns of news selection reflect relationships of *competition and symbiosis* among organizations, where segments are not bifurcated according to left and right leanings, but rather a working balance is achieved within each news niche based on platform preferences and regular habits of program switching across the political spectrum. A shared medium creates a space for audiences to form, and organizations 'compete' with each other in the same niche as they cater to individuals with similar tastes and characteristics.

For example, Fox and MSNBC share the cable television space, and people often watch both programs when they channel surf the news (Shafer, 2022). In a similar vein, those who prefer the *New York Times* usually also read the *Washington Post*. Finally, Breitbart does not take viewers away from the larger right-leaning players like Fox News, but rather they draw from the audience and even add to it by directing individuals from the fringes of the media system to more central outlets (Berry & Sobieraj, 2013; Benkler et al., 2018). Thus, an equilibrium is achieved within a news niche, where organizations cater to audiences based on a range of factors, including platform preferences, socio-economic status, and geographic location. This thinking is in line with studies that show how people carve out cross-media repertoires that anchor them to a 'nexus' of platform and place (Schrøder, 2015).

**Utility of Concept: Fragmentation, Community Detection, and the News Niche**

The concept of a news niche has great utility for the study of audience fragmentation. We have identified at least three advantages of the approach that cannot be gained without examining and comparing portions of the news audience. First, the revised niche concept allows for a more fine-grained look at the news audience, allowing researchers to identify characteristics of organizations and individuals who comprise a given niche and describe the differences between niches. These affordances give rise to a host of empirical questions about the relationships among organizations and individuals within and between audience niches.

For example, one might speculate that the organizations that occupy the same audience space share a common ideology, or what we refer to as *editorial valence*. On the other hand, an equally plausible conjecture is that two organizations occupy the same niche not because they are similar, but because they form symbiotic relationships to serve different needs of that audience segment. Thus, it is an open question whether organizations within niches are similar or different in terms of editorial valence. Likewise, it is not clear whether individuals within a niche differ in terms of the ideological slant of their news selections, which we refer to as *selection valence*. While individuals within a niche share a common experience with a subset of media organizations, this shared experience may not be defined by ideological homogeneity in news selection. Based on this logic, we have developed a set of three interrelated research questions.

RQ1: What news niches can be observed in the American attention network?

RQ2: Is variation in the editorial valence greater within niches or between niches?

RQ3: Is variation in selection valence greater within niches or between niches?

Another distinct advantage of the niche approach is that it affords researchers the ability to parse out different levels of influence on an individual's news selections. We have reviewed literature on the role of individual motivations and routines/habits, as well as the ways in which

these individual-level factors interact with organizational-level market forces and the sociotechnical structures of news curation in online spaces. With these ideas in mind, we can identify and analyze three distinct influences on an individual's selection valence: (1) their own political ideology (i.e., *individual ideology*); (2) the average editorial valence of news organizations within an individual's niche, which we refer to as *organizational ideology*; and (3) the average ideology of others in the niche, which we refer to as *audience ideology*. The niche concept helps researchers to parse these effects by structuring relevant comparisons. That is, an individual's news selections should be most affected by the organizations and audience members within their niche in addition to their own political ideology.

H1: Individual ideology will be positively related to selection valence.

H2: Organizational ideology will be positively related to selection valence.

H3: Audience ideology will be positively related to selection valence.

Finally, given the multilevel nature of the relationships under study (H1-H3), we propose an exploratory research question. If organizational and audience characteristics shape the range of choice—that is, they narrow the 'menu' options down from many to a more manageable subset—then it is plausible that individual predispositions interact with these contextual factors.

RQ4: Does (a) organizational ideology or (b) audience ideology moderate the relationship between individual ideology and selection valence?

## Methods

### Design and Data

The study is based on a 17-wave, rolling cross-sectional survey administered in the United States ($N$ = 1,965). Respondents were recruited by Qualtrics and completed the survey

online between September 3 and November 1, 2020 (Incidence Rate = 100%; Cooperation Rate (CR3) = 70%; AAPOR, 2016). Each survey wave was balanced according to quotas for age, race, gender, and census region according to the 2018 American Community Survey (Table A1 in the online appendices). Data were weighted by education and income (Table A2). Missing values were imputed using a chained equations technique (Fully Conditional Specification; van Buuren & Groothuis-Oudshoorn, 2011).

**Measures**

***Open-Ended News Use Questions***

Survey respondents were asked three times to "write the name of a news outlet (e.g., *The New York Times* or nytimes.com, Fox News or foxnews.com, WBRC Birmingham) that you used in the past week." These open-ended news use measures require respondents to engage in free recall, which is more cognitively demanding than close-ended measures relying on cued recall (Kruikemeier et al., 2018). Because of this additional demand, open-ended measures reduce random error arising from patterned response or poor recall (Prior, 2009). The responses were cleaned and categorized to indicate discrete news outlets (e.g., "*The New York Times*" or "Fox News"), with broader categories created for responses where data reduction reduced noise and enhanced clarity (e.g., television call letters, channel numbers, or network affiliations were combined into a "local television" category). After filtering the data (see below), respondents named 37 distinct outlets/categories (Appendix, Table B1).

***Editorial Valence and Organizational Ideology***

The news outlets named in the open-ended measures were coded for their editorial valence (-3 = *Very Liberal*, 0 = *Neutral*, 3 = *Very Conservative*) by three trained coders (Krippendorf's alpha > .90 for 10% of the list). Based on prior literature (Stroud, 2010), coding

adhered to a hierarchical coding guideline: (1) the editorial valence as identified by existing scholarship (e.g., Budak et al., 2016; Otero, 2018); (2) if not identified in prior literature, the outlet's stated ideology; (3) if not stated, the balance of candidate endorsements dating back to 2012; (4) if no endorsements, ideological stances in editorials. If coders could find no information based on these criteria, the outlet was assumed to be neutral. The variable ranges from -2.0 to 2.2, with a mean of -0.1 (*SD* = 0.8). Finally, organizational ideology was computed by taking the average editorial valence of the organizations within each niche (i.e., the group mean for each niche).

***Selection Valence***

Selection valence characterizes the slant of an individual's exposure or attention based on the outlets they named in the survey. We assigned each respondent the coded editorial valence scores for the organizations they named. These scores were then averaged for each respondent, creating an index of selection valence (*M* = -0.1, *SD* = 0.8).

***Individual and Audience Ideology***

Individual political ideology was measured with three survey items asking respondents to place themselves on an 11-point, L-R scale (-5 = *Liberal*, 0 = *Neutral*, 5 = *Conservative*). This item has a mean of 0.2 (*SD* = 3.0). Audience ideology was computed by taking the average ideology of respondents within a given niche (i.e., the group mean for each niche).

***Control Variables***

Regression analyses control for demographics, including age (*M* = 3.0, *SD* = 1.6 where 1 = *18-24* and 8 = *85 or older*), gender (51% female; 1 non-binary respondent was grouped in this category for analytic purposes), race (40% persons of color, not including white-identifying Hispanics), education (*M* = 4.5, *SD* = 1.8 on a 7-point scale where 1 = *No high school diploma*

and 7 = *Post-graduate degree*) and income ($M$ = 4.7, $SD$ = 2.3 on an 8-point scale where 1 = *Less than $15,000* and 7 = *More than $150,000*). Finally, analyses control for political interest, which was measured with three items asking how interested respondents are (1 = *Not at all* and 5 = *Very*) in politics, news, and community ($M$ = 3.5, $SD$ = 1.0).

## Analysis and Results

### *Analytical Strategy*

Following previous work on projection networks, we constructed a projection of audience overlap from the open-ended news use measures (Ksiasek, 2011; Mukerjee et al., 2018, 2022). Based on recommendations from prior literature, the projected network was filtered to reduce systematic measurement error by removing connections with an edge weight < 2 (Author, YYYY). While studies of audience attention networks employing close-ended survey measures use other filtration methods designed to reduce non-systematic measurement error (Mangold & Scharkow, 2020), open-ended data present a different problem, that of systematic measurement error, which arises from systematic tendencies to over- or underestimate phenomena of interest (King et al., 1994). Therefore, we rely on filtration methods tailored to this measurement issue.

### *Identifying the News Niches*

After filtering the network, and to answer RQ1, we ran a series of clustering algorithms on the projection that: a) best fit the theoretical assumptions for audience fragmentation; and b) produced the most consistent results. Louvain/Multilevel clustering met these criteria, producing three stable niches (Appendix, Figure C1). Model specification has a major influence on network composition, and we tested alternative structures and algorithms (Appendix, Table C3). We chose the Louvain approach because it produced the most straight-forward interpretation. While alternative structures yielded better modality statistics, those models do not employ projection

networks and therefore do not align with existing theory. In addition, Louvain has been shown to perform best for fragmentation studies based on multiple datasets (Mukerjee, 2021).

We have labeled the three niches according to the organizations they comprise: (1) *right-leaning cable and television*, which is characterized by high levels of attention to television news (both national broadcast and cable news on the left and right), as well as prominent right-wing or right-leaning digital news organizations (e.g., Breitbart and the *New York Post*); (2) *left-leaning elite press*, comprising prominent coastal prestige newspapers including the *New York Times* and the *Washington Post*, along with left-leaning digital news organizations such (e.g., Huffington Post and Politico); and (3) *local—aggregators*, which features heavy reliance on news aggregators, local media, and social media in addition to prominent centrist newspapers (e.g., *USA Today* and the *Chicago Tribune*). After obtaining categories, respondents were assigned a nominal code representing their news niche based on the extent to which their responses to the open-ended news attention measures aligned with one of the categories (cable: $n = 905$; elite: $n = 195$; local: $n = 344$). Respondents whose answers did not fall cleanly into one of the three categories were considered to have no niche ($n = 564$).

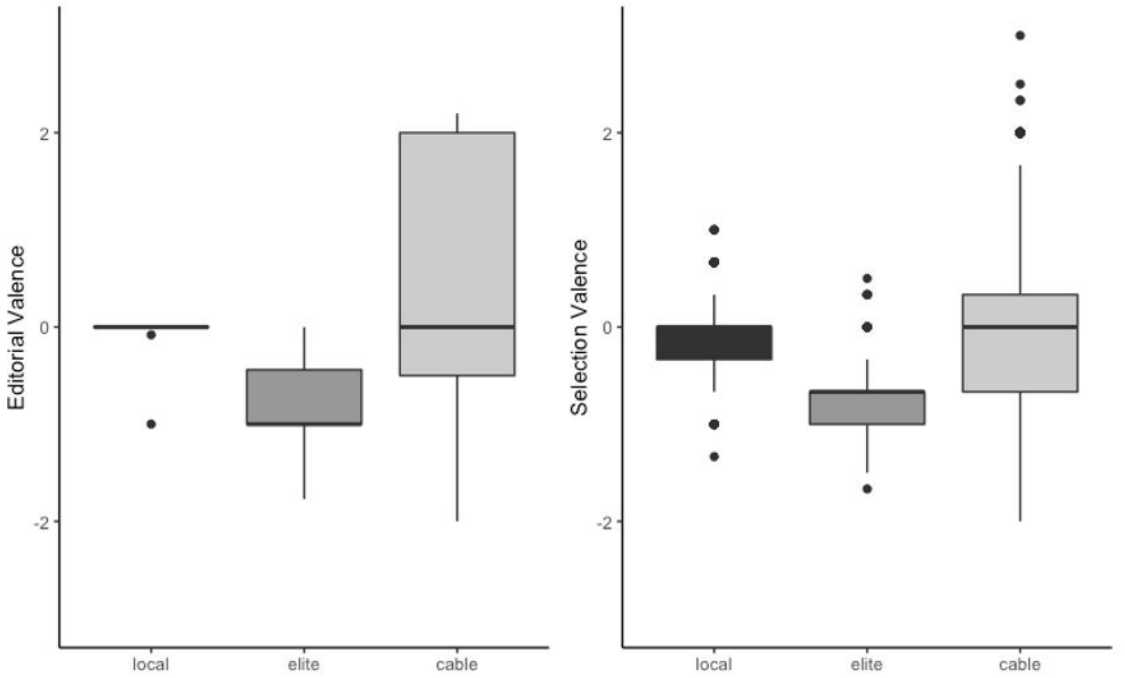
Having identified the three news niches (RQ1), one-way ANOVA was used to assess the between-group and within-group variance in editorial valence (RQ2) and selection valence (RQ3). A visual inspection of the projection network shows considerable overlap among news niches, which raises the question of whether there are differences between the niches in terms of ideology. The answer to this question is unequivocally yes. At both the organizational (RQ2) and individual levels (RQ3), the between-group variance is substantially larger than the within-group variance (see Table appendix C2 for full results), resulting in significant $F$-statistics (at the organizational level, $F(2) = 5.19$, $p = 0.011$; at the individual level, $F(2) = 81.20$, $p < 0.001$),

which can be interpreted as the ratios of between-group to within-group variance. These results indicate that differences between the news niches are larger than differences among individuals within each niche. A closer inspection of the means shows that at both levels, the mean of the *elite* group is different from the means of the other two groups (Figure 1), with a significantly more liberal editorial valence ($M$ = -0.79 versus a grand mean of -0.10) and selection valence ($M$ = -0.73 versus a grand mean of -0.10). Meanwhile, the other two groups have similar means, but different variances. The *local* group displays a small variance estimate with cases clustered around the mean (*Var*. = 0.09 for editorial valence and *Var*. = 0.15 for selection valence).

In contrast, the *cable* group displays a large variance estimate with cases widely dispersed around the mean (*Var*. = 1.88 for editorial valence and 0.79 for selection valence). Thus, the three niches are substantially different from one another: The elite niche is solidly liberal with both individuals and organizations ranging from left-leaning to solid left; the local niche is primarily centrist, with individuals and organizations clustered around the neutral point; and the cable niche is the most ideologically diverse, with a centrist average but also a broad array of individuals and organizations on either side.

**Figure 1**

*Boxplot of Mean Ideological Valence for Three News Niches at Organizational and Individual Levels*




*Note.* Editorial valence = editorial slant for all organizations within the niche; selection valence = mean ideology of selections for the audience within the nice (+ = right-leaning).

***Hypothesis Testing***

Next, we used multilevel modeling to assess the effects of individual ideology on selection valence, while also accounting for how those effects are shaped by the news niches (H1). Because the time-ordered and grouped data structure could produce measurement invariance, it is important to test whether the outcome varies across sampling frames and niches. A null multilevel model shows that it does vary across these structures (17 frames x 3 niches = 51 groups) with a standard deviation of approximately .31, and a comparison with a null linear model (which does not account for time and group structures), shows that the multilevel model is a better fit to the data ($\chi^2 = 85.94$, $p < .001$). Therefore, it is necessary to include both sampling frame and news niche as grouping variables (3 niches x 17 frames = 51 groups). Level-one

predictors are centered on the group mean to ease interpretation of the fixed effects. Results are shown in Table 1. The first model in the table shows the fixed and random effects of individual ideology. The fixed effect is positive and statistically significant ($b = 0.06$, $SE = 0.01$, $p < 0.001$). But while the intercept for selection valence varies between groups (*Var.* = 0.09), the random effect of individual ideology is close to zero (*Var.* = 0.00), resulting in a low ICC of 0.17. These results indicate that while the mean for selection valence varies across groups, the effect of individual ideology on selection valence is stable. Thus, H1 is confirmed.

The next two models in the table layer on contextual effects for organizational ideology (H2) and audience ideology (H3). These can be interpreted as characteristics of news niches: Audience ideology is calculated as the group mean of individual ideology within each niche, and organizational ideology is calculated as the group mean of editorial valence for all outlets within each niche. That is, the former captures the effects of *the ideology of other people within a niche*, and the latter captures the effects of *the editorial valence of organizations with a niche*.

As shown in the table, both effects are statistically significant and substantially larger than the effect of individual ideology. For audience ideology, the effect is $b = 0.43$ ($SE = 0.04$, $p < 0.001$), and for organizational ideology, it is $b = 1.02$ ($SE = 0.09$, $p < 0.001$). These effect sizes are compared in a dot-and-whisker plot in Figure 2, which shows that the organizational effect is the largest (Cohen's $d = .30$) and the individual effect is the smallest ($d = .16$), with the audience effect close in magnitude to the organizational effect ($d = .28$).

Table 1

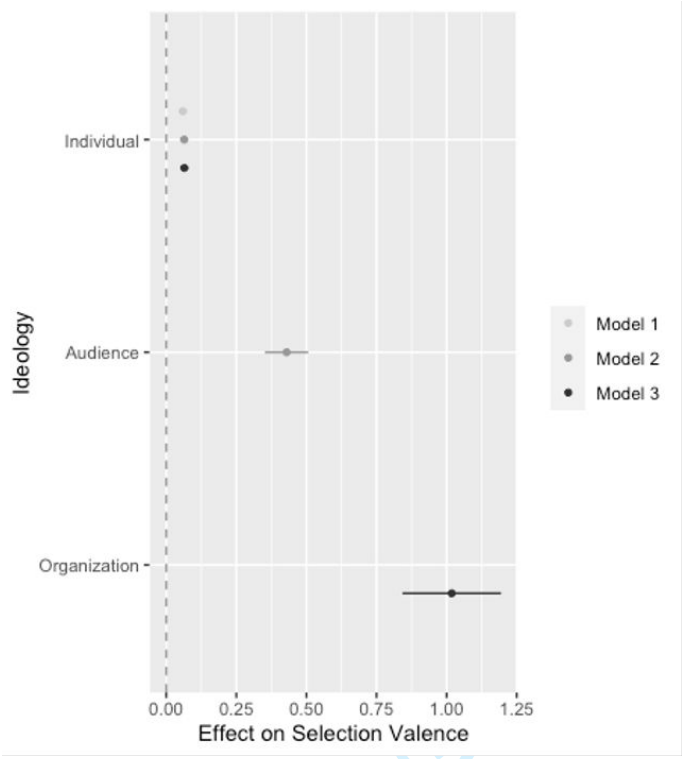
*The Predictors of Selection Valence (+ = Right-Leaning News) at the Individual, Audience, and Organizational Levels*

| | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Fixed Effects** | *b* | *SE* | *b* | *SE* | *b* | *SE* | *b* | *SE* | *b* | *SE* |
| Intercept | -0.21*** | 0.05 | -0.14*** | 0.03 | 0.00 | 0.03 | -0.14*** | 0.03 | 0.00 | 0.03 |
| Age | -0.04*** | 0.01 | -0.04*** | 0.01 | -0.04*** | 0.01 | -0.04*** | 0.01 | -0.04*** | 0.01 |
| Gender (1 = Female) | 0.01 | 0.04 | 0.00 | 0.04 | 0.00 | 0.04 | 0.00 | 0.04 | 0.00 | 0.04 |
| Race (1 = Person of Color) | -0.15*** | 0.04 | -0.15*** | 0.04 | -0.16*** | 0.04 | -0.15*** | 0.04 | -0.15*** | 0.04 |
| Education | -0.01 | 0.01 | -0.01 | 0.01 | -0.01 | 0.01 | -0.01 | 0.01 | -0.01 | 0.01 |
| Income | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 |
| Political Interest | -0.04* | 0.02 | -0.04* | 0.02 | -0.04* | 0.02 | -0.04* | 0.02 | -0.04* | 0.02 |
| Individual Political Ideology | 0.06*** | 0.01 | 0.06*** | 0.01 | 0.06*** | 0.01 | 0.06*** | 0.01 | 0.07*** | 0.01 |
| **Effects of Niche** | *b* | *SE* | *b* | *SE* | *b* | *SE* | *b* | *SE* | *b* | *SE* |
| Audience Ideology | | | 0.43*** | 0.04 | | | 0.44*** | 0.04 | | |
| Organizational Ideology | | | | | 1.02*** | 0.09 | | | 1.03*** | 0.09 |
| **Interactions** | *b* | *SE* | *b* | *SE* | *b* | *SE* | *b* | *SE* | *b* | *SE* |
| Individual Ideology * Audience Ideology | | | | | | | 0.02# | 0.01 | | |
| Individual Ideology * Organizational Ideology | | | | | | | | | 0.08** | 0.03 |
| **Random Effects** | *Var.* | | *Var.* | | *Var.* | | *Var.* | | *Var.* | |
| Intercept (Niche by Sample Frame) | 0.09 | | 0.01 | | 0.01 | | 0.01 | | 0.01 | |
| Individual Ideology | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | |
| Residual | 0.45 | | 0.44 | | 0.44 | | 0.44 | | 0.44 | |
| **Fit Statistics** | | | | | | | | | | |
| LR | -1,720.00 | | -1,686.47 | | -1,685.37 | | -1,688.34 | | -1,684.30 | |
| ICC | 0.17 | | 0.02 | | 0.02 | | 0.03 | | 0.02 | |

*Notes*: Cell entries are parameter estimates from multilevel models (MLM) with random slopes and intercepts. $N$ = 1,444. Groups = 51 (3 niches by 17 frames). $^{\#}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$. Data weighted by education and income. Variables are group-mean centered. Contextual effects are at different levels of analysis and not directly comparable.

**Figure 2**

*Dot-and-Whisker Plot Showing Effects on Selection Valence at the Individual, Audience, and Organizational Levels*



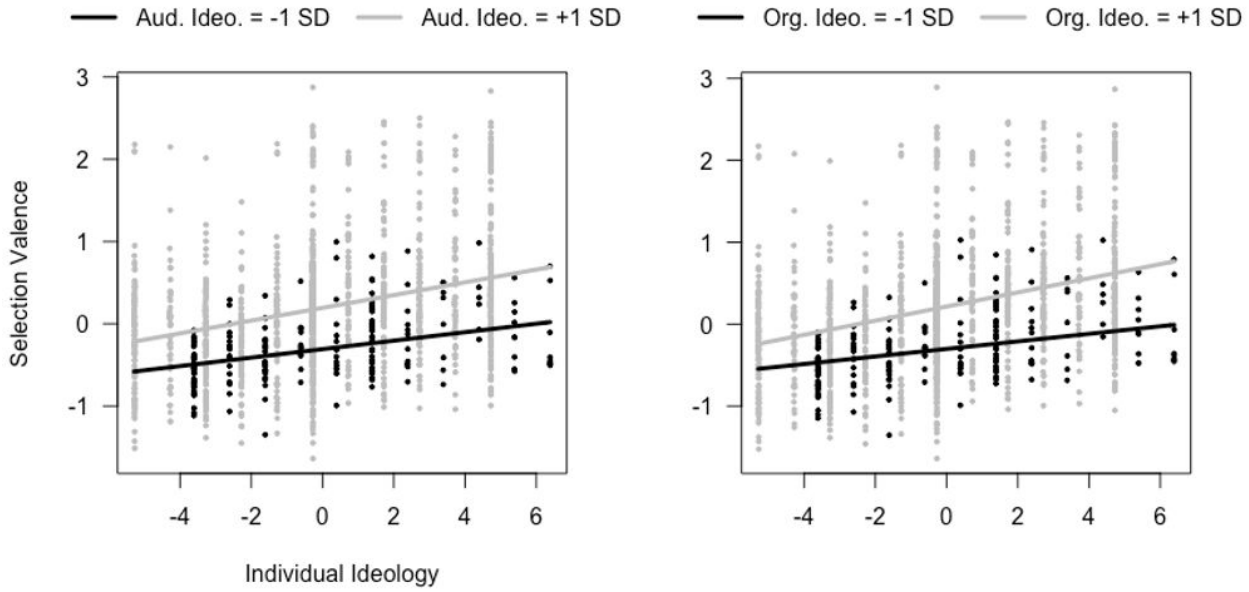

*Note.* Influence of political ideology at various levels of analysis as reported in Table 1.

Therefore, these results show that while an individual's own political ideology matters, the editorial valence of organizations and audience members within the niche have a stronger relationship with the ideological valence of their news exposure. H2 and H3 are confirmed.

To further explore the relationships among the various levels of analysis, and to answer RQ4, the final interaction models in Table 1 test whether individual ideology interacts with audience ideology and/or organizational ideology. Results (Figure 3) show a marginal but non-significant interaction with audience ideology ($b = 0.02$, $SE = 0.01$, $p < .10$), and a statistically significant interaction with organizational ideology ($b = 0.08$, $SE = 0.03$, $p < .01$). These

**Figure 3**

*Conditional Effects of Individual Ideology on Selection Valence at Various Levels of Audience Ideology and Organizational Ideology*




conditional effects are plotted in Figure 3, which shows that the positive effect of individual ideology is stronger where it aligns with audience and organizational ideology.

## Discussion

This study extends the concept of niche news beyond the original framework of market segments based on partisan motivations (Stroud 2010, 2014) to incorporate audience-level characteristics that influence exposure to ideological news. Drawing on audience overlap studies, we situate people within discrete but overlapping clusters based on community detection. Our findings point to three broad conclusions: (1) identifiable niches can be detected despite widespread overlap to the extent that; (2) the ideology of the audience within each niche is related to the news selections of individuals within that niche; and (3) individuals' news selections are related to predictors at multiple levels of analysis, and these may interact with one another. We will now elaborate about each of these conclusions.

First, it is clear from our analysis that news niches are identifiable features of the audience network, although we observe considerable overlap among them. Thus, the field is faced with a contradiction. Polarized consumption habits are observable, yet overlap is the defining structural feature of networks (Fletcher & Nielsen, 2017; Majó-Vázquez et al. 2019). We see this as a product of separately analyzing individual- and network-level data. By taking a multilevel approach, we find some support for ideological fragmentation, as some, but not all, of the niches we observed were statistically different from others in terms of their mean ideological character. That said, our observations do not fit with the idea that segmentation occurs purely on ideological grounds. For example, while both organizations and individuals in the *elite press* niche were more left leaning than their counterparts in other niches, the other two niches did not cleanly align with a particular ideological slant. The *local—aggregator* niche is centrist or perhaps even non-ideological, while the *cable* niche, while leaning right, importantly displayed a wide range of variation in terms of ideology. The *cable* niche is the most extreme but also comprises both news organizations and individuals from across the political spectrum, indicating that audience members in this niche pay attention to both left- and right-leaning cable outlets (e.g., CNN and Fox News). These findings show that it is possible to detect distinct niches that are defined not only by the ideologies of organizations and individuals, but also by audience repertoires and organizational competition/symbiosis.

Second, our findings yield some novel insights about the role of other people within the same niche in shaping individuals' news selections. This kind of audience-level influence has been overlooked by the literatures on fragmentation and selective exposure. To forward theory in this area, we emphasize two key ideas: (1) news exposure in online environments may take on an 'actuarial' quality: curation algorithms on major platforms use selection criteria that depend on

the past behavior of others with similar selections; and (2) therefore, this kind of actuarial influence means that an individual's exposure would be *most* influenced by other individuals whose past news selections were similar to their own. The niche provides leverage over this prediction, by classifying individual audience members according to their news tendencies and grouping them with other individuals who have similar tendencies. Tests of the hypothesis support our theory, and, in fact, the effect size (Cohen's *d*) for audience ideology ($d$ = .28) is greater than the effect size for individual ideology ($d$ = .16). These insights about the relative influence of audience ideology on individuals' news selections advances theory on selective exposure. While the literature has offered explanations based on individual motivations and/or psychology (Garrett, 2009; Knobloch-Westerwick & Meng, 2009; Stroud, 2011), it has not accounted for environmental factors related to sociotechnical changes, particularly the role of curation algorithms. Thus, our study adds a new layer to this conversation by showing how news selection is at least partially explained by these kinds of sociotechnical factors.

Third, our study advances theory by examining the interactions among influences at the individual, organizational, and audience levels. Prior literature has conceptualized the audience as an 'interaction' between news organizations and individuals (Livingstone, 2005; Webster, 2011). For example, Fletcher and Nielsen (2017) describe the audience as the interaction between system-level structures and audience preferences. Similarly, Stroud (2011) conceptualizes the news niche as the intersection of market competition and individual motivation. These ideas imply that news exposure is shaped by multiple levels of influence, which can perhaps be traced to independent origins (market forces, psychology, sociotechnical features of platforms), but which interact with one another. Our study tests these interactions and finds that the relationship between individual ideology and the valence of news selection is

stronger when an individual 'belongs' to a news niche in which the average organizational ideology aligns with their own. This study therefore advances theory by offering a framework for contextualizing the role of individual motivations in shaping news selection.

The conclusions of the study are limited in several ways. First, while the research design incorporates a 'rolling' time element, it does not include multiple responses from each participant. Thus, the data cannot be used to make causal inferences. Second, the study relies on self-reported measures. Survey respondents underestimate their news exposure, particularly in online settings (González-Bailón & Xenos, 2020). That said, because the open-ended measures require more cognitive effort than close-ended measures, we can be certain that respondents were, in fact, exposed to the media they named in the survey, even if that list is incomplete. Another measurement limitation is related to systematic error inherent in the open-ended measures. Whereas close-ended measures are susceptible to random error (Mangold & Scharkow, 2021), open-ended measures may capture one-time encounters with media that do not reflect habitual patterns of use. To address this issue, the study employs a data filtration method tailored to the problem of systemic error. Finally, effects observed at different levels of observation are not strictly comparable, and comparisons of effect sizes should be made with caution.

This study offers a novel approach for detecting and analyzing niches within news audience networks. Doing so offers insights about the tendencies of specific segments of news audiences and affords researchers the ability to examine multiple levels of influence on news selection. While prior research has dispelled claims about coherent 'filter bubbles' in the US news audience, our analysis suggests that, nonetheless, there are identifiable audience segments characterized by ideological difference at multiple levels of observation. Thus, even while

segmentation may not unfold along ideological lines, it could still play a role in contributing to the erosion or deterioration of social cohesion in the United States.

## References

AAPOR: American Association for Public Opinion Research (2016) *Standard Definitions: Final dispositions of case codes and outcome rates for surveys*.

Arguedes AR, Robertson CT, Fletcher R, et al. (2022) Echo chambers, filter bubbles, and polarization: A literature review. *Reuters Institute for the Study of Journalism*.

Author YYYY

Benkler Y, Faris R and Roberts H (2018) *Network propaganda: Manipulation, disinformation, and radicalization in American politics*. Oxford University Press.

Berry JM and Sobieraj S (2013) *The Outrage Industry: Political Opinion Media and the New Incivility*. Oxford University Press.

Budak C, Goel S and Rao JM (2016) Fair and balanced? Quantifying media bias through crowdsourced content analysis. *Public Opinion Quarterly* 80(S1): 250–271.

Buuren S and Groothuis-Oudshoorn K (2011) mice: Multivariate imputation by chained equations in R. *Journal of Statistical Software* 45: 1–67.

Del Vicario M, Zollo F, Caldarelli G, et al. (2017) Mapping social dynamics on Facebook: The Brexit debate. *Social Networks* 50: 6–16.

DeVito MA (2017) From editors to algorithms. *Digital Journalism* 5(6): 753–773.

Finkel EJ, Bail CA, Cikara M, et al. (2020) Political sectarianism in America. *J. J* V. W, S. C, and Druckman JN (eds) 370(6516): 533–536.

Flaxman S, Goel S and Rao JM (2016) Filter bubbles, echo chambers, and online news consumption. *Public Opinion Quarterly* 80(S1): 298–320.

Fletcher R and Nielsen RK (2017) Are news audiences increasingly fragmented? A cross-national comparative analysis of cross-platform news audience fragmentation and duplication. *Journal of Communication* 67(4): 476–498.

Garrett RK (2009) Politically motivated reinforcement seeking: Reframing the selective exposure debate. *Journal of Communication* 59(4): 676–699.

Garrett RK and Stroud NJ (2014) Partisan paths to exposure diversity: Differences in pro-and counter attitudinal news consumption. *Journal of Communication* 64(4): 680–701.

González-Bailón S and Xenos MA (2020) The blind spots of measuring online news exposure: A comparison of self-reported and observational data in nine countries.

Joris G, Grove FD, Damme K, et al. (2021) Appreciating news algorithms: Examining audiences' perceptions to different news selection mechanisms. *Digital Journalism* 9(5): 589–618.

Jurkowitz M, Mitchell A, Shearer E, et al. (2020) U.S. Media Polarization and the 2020 Election: A Nation Divided. In: *Pew Research Center's Journalism Project*. Available at: https://www.pewresearch.org/journalism/2020/01/24/u-s-media-polarization-and-the-2020-election-a-nation-divided.

Kim SJ (2014) *A Repertoire Approach to Cross-Platform Media Use Behavior*. *New Media & Society. 18*(3): 353-372.

King G, Keohane RO and Verba S (1994) *Designing Social Inquiry: Scientific Inference in Qualitative Research*. Princeton University Press.

Knobloch-Westerwick S and Meng J (2009) Looking the other way: Selective exposure to attitude-consistent and counterattitudinal political information. *Communication Research* 36(3): 426–448.

Kruikemeier S, Lecheler S and Boyer M (2018) Learning from news on different media platforms: An eye tracking experiment. *Political Communication* 35(1): 75–96.

Ksiazek TB (2011) A network analytic approach to understanding cross-platform audience behavior. *Journal of Media Economics* 24(4): 237–251.

Ksiazek TB, Malthouse EC and Webster JG (2010) News-seekers and avoiders: Exploring patterns of total news consumption across media and the relationship to civic participation. *Journal of Broadcasting & Electronic Media* 54(4): 551–568.

Livingstone S (2005) On the relation between audiences and publics. In: Livingstone S (ed.) *Audiences and Publics: When Cultural Engagement Matters for the Public Sphere*. Intellect, pp. 17–42.

Majó-Vázquez S, Nielsen RK and González-Bailón S (2019) The backbone structure of audience networks: A new approach to comparing online news consumption across countries. *Political Communication* 36(2): 227–240.

Mangold F and Scharkow M (2020) How do filtering choices impact structures of audience networks? A simulation study using data from 26 countries. *Communication Methods & Measures* 14(2): 125–144.

Mukerjee S (2021) A systematic comparison of community detection algorithms for measuring selective exposure in co-exposure networks. *Scientific Reports* 11(1): 1–1528.

Mukerjee S (2022) Rethinking Audience Fragmentation Using a Theory of News Reading Publics: Online India as a Case Study. *The International Journal of Press/Politics*.

Mukerjee S, Majó-Vázquez S and González-Bailón S (2018) Networks of audience overlap in the consumption of digital news. *Journal of Communication* 68(1): 26–50.

Nelson JL (2018) And deliver us to segmentation. *Journalism Practice* 12(2): 204–219.

Ohme J and Mothes C (2020) What Affects First- and Second-Level Selective Exposure to. *Journalistic News? A Social Media Online Experiment. Journalism Studies* 21(9): 1220–1242.

Otero V (2018) Media bias chart: Version 4.0.

Prior M (2007) *Post-Broadcast Democracy: How Media Choice Increases Inequality in Political Involvement and Polarizes Elections*. Cambridge University Press.

Prior M (2009) Improving media effects research through better measurement of news exposure. *The Journal of Politics* 71(3): 893–908.

Schmidt AL, Zollo F, Del Vicario M, et al. (2017) Anatomy of news consumption on Facebook. *Proceedings of the National Academy of Sciences* 114(12): 3035–3039.

Schrøder KC (2015) News Media Old and New. *Journalism Studies* 16(1): 60–78.

Shafer J (2022) *Democrats with a Dirty Secret—They Watch Fox*. POLITICO.

Stroud NJ (2010) Polarization and partisan selective exposure. *Journal of Communication* 60(3): 556–576.

Stroud NJ (2011) *Niche News: The Politics of News Choice*. Oxford University Press.

Taneja H, Webster JG, Malthouse EC, et al. (2012) Media consumption across platforms: Identifying user-defined repertoires. *New Media & Society* 14(6): 951–968.

Thorson K and Wells C (2016) Curated flows: A framework for mapping media exposure in the digital age. *Communication Theory* 26(3): 309–328.

Thorson K, Cotter K, Medeiros M, et al. (2019) Algorithmic inference, political interest, and exposure to news and politics on Facebook. *Information, Communication & Society* 24(2): 183–200.

Waisbord S (2018) Truth is what happens to news. *Journalism Studies* 19(13): 1866–1878.

Webster JG (2011) The duality of media: A structurational theory of public attention. *Communication Theory* 21(1): 43–66.

Webster JG and Ksiazek TB (2012) The dynamics of audience fragmentation: Public attention in an age of digital media. *Journal of Communication* 62(1): 39–56.

Weeks BE, Ksiazek TB and Holbert RL (2016) Partisan enclaves or shared media experiences? A network approach to understanding citizens' political news environments. *Journal of Broadcasting & Electronic Media* 60(2): 248–268.

## Appendix A:
## Sample Demographics and Weighting Scheme

Table A1

*Demographic Profile of Survey Sample and Target Population*

| | Current Survey | U.S. Census Bureau: 2016 American Community Survey |
|---|---|---|
| | (%) | (%) |
| Gender | | |
| Male | 49.0 | 49.2 |
| Female | 51.0 | 50.8 |
| Age (median) | 35-44 | 37.7 |
| Ethnicity/race | | |
| White | 59.6 | 62.0 |
| Black or African American Native | 15.9 | 12.3 |
| American Indian and Alaska | 1.5 | 0.7 |
| Native | | |
| Asian | 12.9 | 5.2 |
| Native Hawaiian and other Pacific | 0.2 | 0.2 |
| Islander | | |
| Hispanic | 7.6 | 17.3 |
| Household income (median) | US $60,000–75,000 | US $57,617 |
| Education | | |
| Less than high school graduate | 2.1 | 13.0 |
| High school diploma or equivalent | 15.7 | 27.5 |
| Some college or associate degree | 26.2 | 29.2 |
| Bachelor's degree or higher | 56.1 | 30.3 |

*Note*: The US Census Bureau 2016 American Community Survey is available online at

http://factfinder.census.gov/

Table A2

*Survey Weights*

| Income | |
|---|---|
| Category | Weight |
| Less than $15k | 1.02 |
| $15k to 30k | 1.00 |
| $30k to $45k | 1.00 |
| $45k to 60k | 1.00 |
| $60k to $75k | 1.00 |
| $75k to $100k | 0.86 |
| $100k to $150k | 0.95 |
| More than $150k | 0.95 |
| **Education** | |
| Category | Weight |
| None, or grades 1-8 | 5.75 |
| High school incomplete (grades 9-11) | 1.77 |
| High school graduate (grade 12 or GED certificate) | 1.33 |
| Some college, no 4-year degree (includes Associate's Degree) | 0.89 |
| Technical, trade, or vocational school after high school | 0.65 |
| College graduate (Bachelor's Degree) | 0.42 |
| Post-graduate training/professional school after college | 0.42 |

*Note*. Income measured as annual household income. Education measured in terms of highest level completed. Final survey weights created by multiplying weights for income and education.

## Appendix B:
## Lists of News Organizations Included in Study

Table B1

*List of News Organizations Named in Survey*

| *Rank* | Organization | Mentions |
|---|---|---|
| 1 | Fox News | 650 |
| 2 | CNN | 642 |
| 3 | New York Times | 318 |
| 4 | ABC News | 306 |
| 5 | Local TV News | 292 |
| 6 | NBC News | 246 |
| 7 | CBS News | 206 |
| 8 | MSNBC | 186 |
| 9 | Local News | 179 |
| 10 | Aggregators | 162 |
| 11 | Social Media Sites | 159 |
| 12 | Yahoo News | 130 |
| 13 | BBC News | 110 |
| 14 | Washington Post | 106 |
| 15 | Neutral Sphere | 66 |
| 16 | International Media | 56 |
| 17 | Wall Street Journal | 49 |
| 18 | Right-Leaning Sphere | 46 |
| 19 | NPR | 43 |
| 20 | USA Today | 42 |
| 21 | News Magazines | 41 |
| 22 | Huffington Post | 40 |
| 23 | Buzzfeed | 39 |
| 24 | MSN | 34 |
| 25 | PBS | 32 |
| 26 | CNBC | 31 |
| 27 | One America News | 21 |
| 27 | Los Angeles Times | 21 |
| 29 | Local News Websites | 19 |
| 29 | New York Post | 19 |
| 29 | Left-Leaning Sphere | 19 |
| 32 | Politico | 16 |
| 32 | Newsmax | 16 |
| 34 | Local Radio | 14 |
| 34 | Breitbart | 14 |
| 36 | Chicago Tribune | 12 |
| 37 | Univision | 11 |

*Note*. Open-ended responses coded by three-step filter a) prominence, b) if market size < 1 million, collapsed to outlet/platform, c) receiving < 10 mentions coded valanced spheres.

## Appendix C: Full Results for News Niches

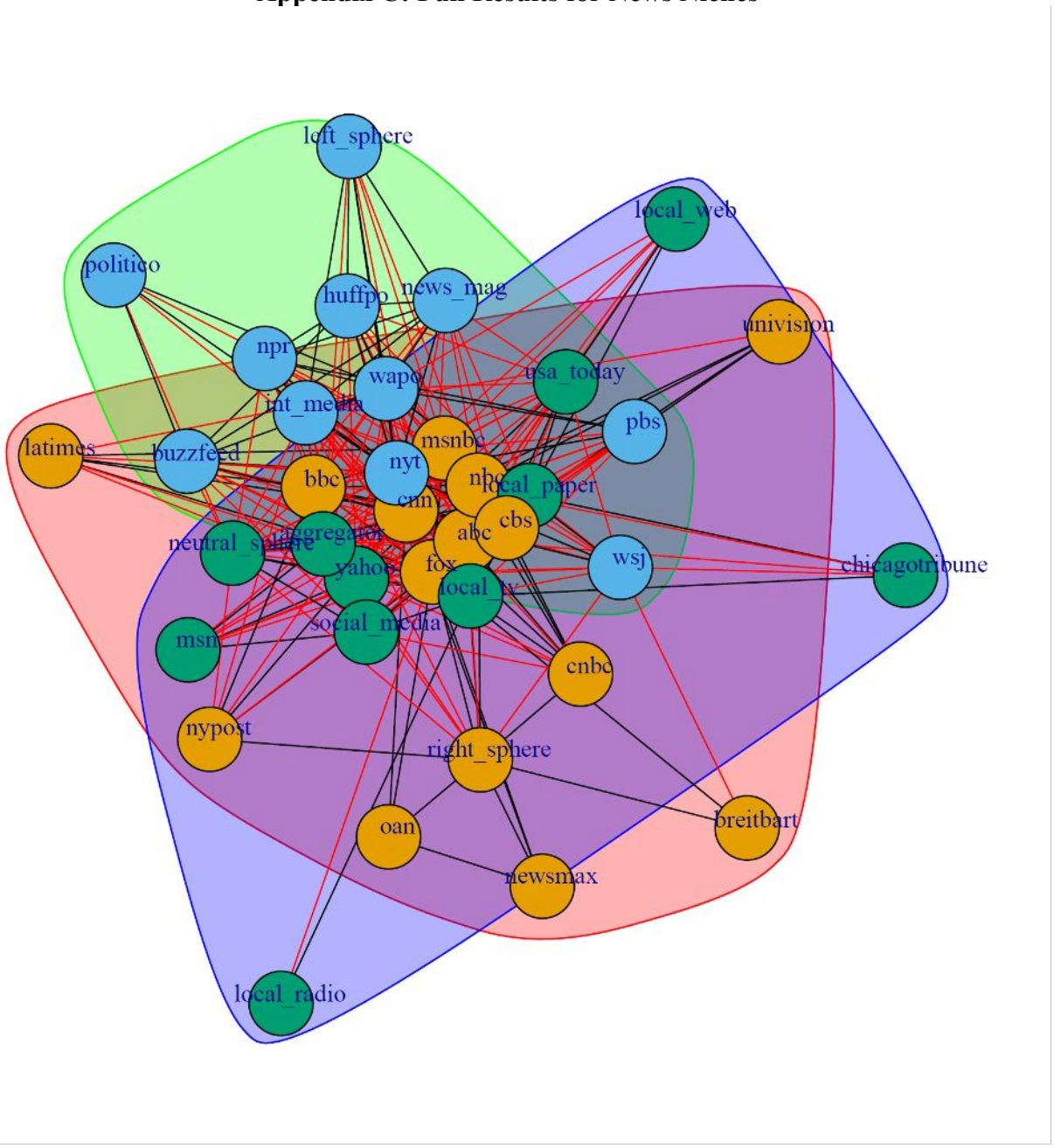



Figure C1

*Network Projection Based on Louvain Cluster Analysis*
Note: Orange = right-leaning cable & television; blue = left-leaning elite press; green = local—aggregator

Table C1

*Organizational Niche Membership*

| **Niche 1** | | **Niche 2** | **Niche 3** | |
|---|---|---|---|---|
| *Right-Leaning Cable & TV* | | *Left-Leaning Elite Press* | *Local/Aggregators* | |
| ABC* | LA Times* | Huffington Post | Aggregators | USA Today |
| BBC* | MSNBC* | NY Times | Chicago Trib. | Yahoo |
| Breitbart | NBC* | Washington Post | Local Paper | |
| CBS* | Newsmax | Politico | Local Radio | |
| CNBC* | NY Post | NPR* | Local TV | |
| CNN* | OAN | Buzzfeed | Local Web | |
| Fox News | Right Sphere | International Media* | MSN | |
| | Univision* | Wall Street Journal* | Neutral Sphere | |
| | | New Magazines* | Social Agg. | |
| | | PBS* | | |
| | | Left Sphere | | |

*Note.* * Denotes organization that does not conform to theoretical expectations based on selective exposure theory.

Table C2

*Means and Variances for Editorial Valence and Selection Valence*

| Statistic | Local/Aggregators | Elite | Cable | Full Sample |
|---|---|---|---|---|
| **Editorial Valence** | | | | |
| Mean | -0.10 | -0.79 | 0.41 | -0.10 |
| Variance | 0.09 | 0.27 | 1.88 | 1.08 |
| *N* | 11 | 11 | 15 | 37 |
| Between-Group Variance | | 4.57 | | |
| Within-Group Variance | | 0.88 | | |
| Test Statistic | | $F$ (2) = 5.19, $p$ = 0.011 | | |
| **Selection Valence** | | | | |
| Mean | -0.07 | -0.73 | 0.03 | -0.10 |
| Variance | 0.15 | 0.15 | 0.79 | 0.62 |
| *N* | 344 | 195 | 905 | 1,444 |
| Between-Group Variance | | 41.29 | | |
| Within-Group Variance | | 0.51 | | |
| Test Statistic | | $F$ (2) = 81.20, $p$ < .001 | | |

*Note.* Outcome variable has an observed range of 5.0 (Min. = -2.0, Max. = 3.0). Data weighted by education and income.

Table C 3

*Performance Comparison of Alternate Detection Algorithms and Model Specifications*

| Algorithm | Groups (N) | Modularity |
|---|---|---|
| *Co-exposure Projection (Theory-Driven)* | | |
| Louvian/Multilevel (ML) | 3 | .108 |
| Fast-Greedy | 4 | .109 |
| Walk Trap | 13 | .054 |
| Spin-Glass | 4 | .026 |
| Leading Eigenvector | 4 | .089 |
| *Bipartite Structure (Data-Driven)* | | |
| Louvian/ Multilevel (ML) | 13 | .442 |
| Walk Trap | 30 | .419 |
| Spin-Glass | 13 | .387 |
| Leading Eigenvector | 14 | .387 |

*Note.* Fast-Greedy not compatible with Bipartite specification. Bipartite specification reflects data structure, while co-exposure reflects theorical structure based on previous studies.