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BIAS IN CABLE NEWS: PERSUASION AND POLARIZATION

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ABSTRACT

We measure the persuasive effects of slanted news and tastes for like-minded news. We use cable channel positions as exogenous shifters of cable news viewership. We examine whether channel positions correlate with variables which predict viewership and voting. We estimate that Fox News increases the likelihood of voting Republican by 0.3 points among viewers induced into watching 2.5 additional minutes per week by differential positions. We estimate a model of voters who select into watching slanted news, and whose ideologies evolve as a result. We quantitatively assess media driven polarization, and simulate alternative ideological slanting of news channels.

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1 Introduction

Political observers across the ideological spectrum routinely make allegations of media bias and its detrimental effect on society. The 24-hour cable news channels, CNN, the Fox News Channel, and MSNBC, are frequent targets of such allegations. In this paper, we address two questions about cable news. First, as in DellaVigna and Kaplan (2007), how much does consuming slanted news, like the Fox News Channel, alter the propensity of an individual to vote Republican in Presidential elections, if at all? Second, as in Gentzkow and Shapiro (2010) for newspapers, how intense are consumer preferences for cable news that is slanted towards their own ideology?

The answers to these questions are key inputs for designing optimal public policy, such as merger policy, for the media sector. If consumers simply prefer news that resonates with their pre-existing ideology, as in Mullainathan and Shleifer (2005) and Gentzkow and Shapiro (2010), then the news media sector is similar to any other consumer product, and should be treated as such by public policy. However, if consuming news with a slant alters the consumer's ideology, then public policy towards the news media sector becomes more complex.[1] In particular, if news consumption alters ideology, and consumers have a taste for like-minded news, then the existence of slanted news could lead to a polarizing feedback loop: an "echo chamber" where partisans can reinforce and strengthen their initial biases.[2] Furthermore, an interested party could potentially influence the political process by owning or controlling media outlets.[3] Recent work by Prat (2014) suggests that if news consumers are not too sophisticated, the scope for such influence can be quite large. Such concerns led the Federal Communications Commission (FCC) to condition approval of the merger of Comcast Corporation and NBC Universal in 2010 on the requirement that Comcast take steps to promote independent news services.[4]

[1] Gentzkow and Shapiro (2008) detail the complexities in designing optimal regulatory policy for media markets.

[2] Gentzkow and Shapiro (2011) indicate that current media consumption tends to be balanced across ideologically slanted sources. This paper identifies trends suggesting that the "echo chamber" scenario may be increasing in relevance.

[3] Existing evidence from Gentzkow and Shapiro (2010) shows that owner partisanship is not an important determinant of newspaper slant. The sample size is too small to test this hypothesis in the cable news case.

[4] The condition required that Comcast move "independent" news channels such as Bloomberg Television into "news neighborhoods." This effectively required Comcast to move Bloomberg next to channels such as

Differentiating the taste mechanism from the influence mechanism is difficult in observational data. The analyst observes a positive correlation between the propensity to vote Republican and hours spent watching Fox News. Were Fox News viewers already predisposed to vote Republican, and the observed correlation driven by preference for watching like-minded news? Or were some fraction of those viewers persuaded to vote Republican as a consequence of watching Fox News?

The essential ingredient in our analysis is the use of the channel positions of news channels in cable and satellite television lineups as instrumental variables. Variation in channel positions causes some viewers to watch more or less of these channels. We use the corresponding induced variation in time watched to estimate whether or not watching slanted news changes voting behavior. We estimate that watching the Fox News Channel for 2.5 additional minutes per week[5] increases the probability of intending to vote for the Republican presidential candidate by 0.3 percentage points for voters induced into watching by variation in channel position. The corresponding effect of watching MSNBC for 2.5 additional minutes per week is an imprecise zero.

As with any instrumental variables design, it is critical that the channel positions for Fox News and MSNBC are exogenous, and not chosen to accord with local political tastes. In Section 2, we describe turbulence in the cable industry in the years 1994-2000 that could plausibly have induced as good as random variation in channel positions across locations. We then check the correlation of Fox News position with observable characteristics of a zip code. Fox News channel position does not predict pre-Fox voting and political contribution behavior. It is also uncorrelated with the component of both voting behavior and Fox News viewership that is predictable from observed demographic characteristics. We additionally find that the local cable channel positions of Fox News and MSNBC correlate much more strongly with the channels' viewership among cable television subscribers than with viewership by satellite television subscribers - who see a single nationwide channel position lineup - in the same zip code.

Our approach to quantifying the second object of interest, the preference for like-

MSNBC and CNN in their channel lineups. The FCC justified the condition "in accordance with the special importance of news programming to the public interest," and did not place any such conditions on non-news programming. See `https://apps.fcc.gov/edocs_public/attachmatch/FCC-11-4A1.pdf`, paragraph 122.

[5]Approximately 2.5 minutes per week is the additional time spent watching Fox News associated with a one-standard-deviation decrease in Fox News channel position.

minded news, adapts the method of Gentzkow and Shapiro (2010), who estimate this quantity in the context of US daily newspapers. We first place the cable news channels on the ideological spectrum by quantifying how similar the language employed by the channels is to the language employed by individual members of Congress. This method provides a measure of ideological slant for each channel in each year. We measure the relationship between changes in the slant measure over time and the characteristics of viewers of these channels. A key source of variation in this exercise is MSNBC's change in business strategy towards offering more explicitly liberal content around 2006. Our ideology estimates pick up this format switch - MSNBC closely tracks CNN in the early 2000s, but then moves left following the format switch in 2006. We estimate Fox News' ideology to the right of CNN throughout the sample period, although the distance between the two has been widening in the most recent years.

We conduct the analysis of these two questions in a unified framework. We model consumer-voters who choose how much time to spend watching the cable news channels; whether to subscribe to cable, satellite or nothing at all; and for whom to vote in presidential elections. Consumers' allocation of time to television channels is governed by their preferences for the channels (which are a function of their ideology, the channels' ideologies, and their demographics), and the availability of the channels (whether the cable operator carries them and, if so, the positions they occupy on the channel lineup). Consumers' ideologies evolve from their initial position depending on how much time they allocate to watching channels of different ideologies. This process culminates in a presidential election in which consumers choose for whom to vote.

We estimate the parameters of the model by simulated indirect inference. The criterion function is the distance between two-stage least squares estimates of intention to vote on demographics and hours watched of each channel, using channel positions as instrumental variables, in the actual data and in data simulated from the model. In addition to matching the second stage regression coefficients, we also match the first stage (viewership equation) regression coefficients and the "mis-specified" OLS regression coefficients. We use data covering 1998 to 2008 from multiple sources including (1) high quality channel lineup data that provides channel positions and availability by zip code, provider, and year, (2) individual level and zip code level viewership data (from independent samples) on hours watched by channel and year together with demographics, (3) individual level survey data on intent to vote Republican in presidential

elections together with demographics as well as zip code level actual vote shares for 2008, (4) county-level presidential vote shares, (5) broadcast transcripts of Fox News, CNN, and MSNBC by year, and (6) the Congressional record by year.

We use the estimated model to quantitatively assess the degree of ideological polarization induced by cable news, the effect of the entry of Fox News prior to the year 2000 election, and the level of "media power" (Prat, 2014) posessed by each of the news channels individually as well as a hypothetical conglomerate under unified ownership. We find that cable news does increase polarization among the viewing public, although the magnitude of this increase is fairly modest. Furthermore, the increase in polarization depends critically on the existence of *both* a persuasive effect *and* a taste for like-minded news. We estimate that removing Fox News from cable television during the 2000 election cycle would have reduced the overall Republican presidential vote share by 0.45 percentage points. Finally, we find that the cable news channels' potential for influence on election outcomes is large, and would be substantially larger were ownership to become more concentrated.

This paper contributes to the empirical literature on the causes and effects of the news media, particularly regarding political outcomes.[6] The closest papers to this study are by DellaVigna and Kaplan (2007) and Gentzkow and Shapiro (2010).

DellaVigna and Kaplan (2007) study the effects of Fox News by comparing vote shares in locations with and without cable access to Fox News by November 2000, as partially measured by the Cable and Television Factbook data set. Our contribution to this strand of the literature is to introduce a new identification strategy, channel positions, to measure the effects of Fox News.[7] Channel position variation allows a

[6]A number of papers have demonstrated that media usage or availability affects behavior. Amongst others, Chiang and Knight (2011) find positive effects of unexpected newspaper endorsements on vote shares for the endorsed candidate, Gentzkow (2006) finds decreased voter turnout from television access, Gerber et al. (2009) find positive effects of newspaper exposure, regardless of slant, on Democratic vote shares in the 2005 Virginia gubernatorial elections. Enikolopov et al. (2011) find that viewing an independent news channel in Russia increased vote shares for the opposition parties and decreased overall turnout in 1999. Lim et al. (2014) find that media coverage can affect criminal sentencing decisions for judges.

[7]In Appendix C, we document that the data set used in DellaVigna and Kaplan (2007) has severe mismeasurement of Fox News availability. Nearly 40% of the "control group," the locations that they consider as not having cable access to Fox News in 2000, did in fact have cable access to Fox News. 25% of the control group had Fox News availability since 1998. Their data set simply had not been updated to reflect Fox News's arrival in those locations. We detail how their results change upon correcting the measurement error in Appendix C.

researcher to examine the effects of cable news in latter years where there is negligible variation in availability of these channels. The use of channel positions as instrumental variables could be useful for studying the effects of media consumption in other contexts. In terms of results, we estimate a Fox News effect that is statistically positive and quantitatively large as in the original DellaVigna and Kaplan (2007) analysis. Indeed, our estimated counterfactual effect of removing Fox News on the change in year 2000 election Republican vote share is 0.45 percentage points which resonates well with the DellaVigna and Kaplan (2007), updated with more accurate availability data, estimated range of 0.26 to 0.36 percentage points.

Our approach follows Gentzkow and Shapiro (2010) in several dimensions, including the use of text analysis to measure media outlet slant. Like Gentzkow and Shapiro (2010), we treat that measure as a characteristic over which consumers have heterogeneous tastes when choosing media consumption levels. Our contribution is to model media consumption together with voting to separately measure tastes for like-minded news and the influence of slanted media consumption on consumer ideology. The influence effect also interacts with the existence of tastes for like-minded news. Consumers for whom both effects are present can be induced into feedback loops where they consume slanted media, their ideologies then evolve in the direction of the slant, then their taste for that slanted media increases, and so on in a loop. In this sense, this paper combines the literature on the persuasive effects of the media with the literature on self-selection into consumption of slanted media to explore media-driven polarization and to counterfactually simulate alternative ideological slant strategies.

2 Institutional Overview

During our study period of 1998-2008, most households had three options for television service: subscribe to a cable (that is, a wire-based transmission) package, subscribe to a satellite television package, or subscribe to neither and receive only over-the-air broadcast signals.[8] In 2000, the vast majority of cable or satellite subscribers were

[8]Some households, for example households in remote rural areas, did not have a cable option. Some households which did not have a direct line of sight due to physical obstructions like tall buildings, trees, or steep slopes, did not have a satellite option. And some households, mostly in urban areas, had two wire-based cable operators. In 2004 about 85% of US zip codes, accounting for about 67% of the total population, were

cable subscribers, but by 2008, satellite providers had a market share of about 30%. Different locations have different cable providers such as Comcast, Time Warner Cable, Cox, Cablevision, or Charter. The set of channels, or content, in a cable package varies across providers and within providers across locations. A typical set of cable packages would have one Basic package which retransmits the over-the-air signals, an Expanded Basic package which includes the top 40 to 80 cable channels such as ESPN, USA, TNT, CNN, Nickelodeon, MTV, Comedy Central, and similar, and a digital package which offers more niche content like the DIY Channel or the Tennis Channel. Throughout the period, there were two nationwide satellite providers: DirecTV and the Dish Network. Each satellite provider offers the same channel lineup and packages in all locations.

Cable content is produced by media conglomerates such as Viacom, News Corporation, ABC-Disney, or NBC Universal. The cable and satellite providers contract with these firms to offer their content to subscribers. This bilateral contracting is the focus of Crawford and Yurukoglu (2012), which provides more detail about the industry's structure. There was some vertical integration during our sample period: News Corporation had a controlling interest in DirecTV, and Time Warner and Time Warner Cable were integrated.

The foci of this study are the cable news channels the Fox News Channel and MSNBC. CNN began broadcasting in 1980 as one of the earliest cable channels of any genre, and pioneered the 24 hour news channel format. In our analyses we make no assumption that CNN's content is neutral or moderate. We apply the same text-based measures to estimate its ideology as we do for the other cable news channels. However, even though CNN may also be the target of accusations of bias, the focus of our analysis is on Fox News and, to a lesser extent, MSNBC which are more commonly thought to have acute slanted positions. The Fox News Channel and MSNBC both entered the market in the mid 1990's. Launched by the News Corporation in late 1996, Fox News Channel's business strategy was to provide news with a more conservative slant. This strategy and the perception of such a slant continues today. Fox News has become one of the most highly rated cable channels across all genres. It is a cultural force in the U.S. synonymous with media bias and the mixing of news and entertainment. MSNBC began as a joint venture between NBC and Microsoft. At the outset, MSNBC did not have any explicit slant. MSNBC changed its business strategy in the mid-2000's to

served by a single monopolist wire-based cable operator.

provide news with a more liberal slant as detailed in Sanneh (2013).

The channel lineup, or the numerical ordering of channels, varies by local cable system. In most cases the first ten to twenty channel positions are allocated to the over-the-air broadcast affiliates. For example, NBC4 occupies channel position 4 in Washington D.C. area cable systems. After the over-the-air channels, the cable channels begin. We assert in this paper that the ordering of a channel in the lineup can have significant effects on the viewership of news channels. The significant relationship between channel position and viewership holds for all genres, not just news. See Figure 1, which plots the relationship between ratings and channel position for a set of 34 channels, including both the news channels and other channels that tend to occupy similar positions in cable lineups. Table 46 in the Appendix documents the own-position coefficient on cable and satellite subscribers for these channels.

The obvious empirical concern is that a channel might be placed in lower positions in localities with high tastes for the channel. We later examine that concern by correlating local cable channels positions with the predictable by demographics portion of Republican voting, the predictable by demographics portion of Fox News viewing, pre-Fox News voting and partisan political donations, and viewership of Fox News by satellite subscribers. Describing the process by which channel positions were determined provides additional support for the claim that channel positions are valid instruments.

The 1994-2001 period during which Fox News and MSNBC were rolling out was a tumultuous time for the cable television industry. This period saw many systems upgrade from older analog to newer digital equipment, expanding the number of channels cable operators were able to offer their subscribers. Coincident with this technical advance, a wave of new channels (including the two cable news channels that are the focus of this paper) entered cable lineups alongside first-generation channels like CNN, ESPN, MTV, TBS, TNT and the USA Network.

However, the timing of the advances in content and technology were not coordinated: some systems invested in upgrades early, before the wave of new channel entry, and some later. Meanwhile, bilateral deals for content distribution were being struck between the numerous new channels and cable system operators, of which in this period before the early-2000s wave of consolidation there were many. As a result, the channel positioning that Fox or MSNBC ended up with on a given local system depended on

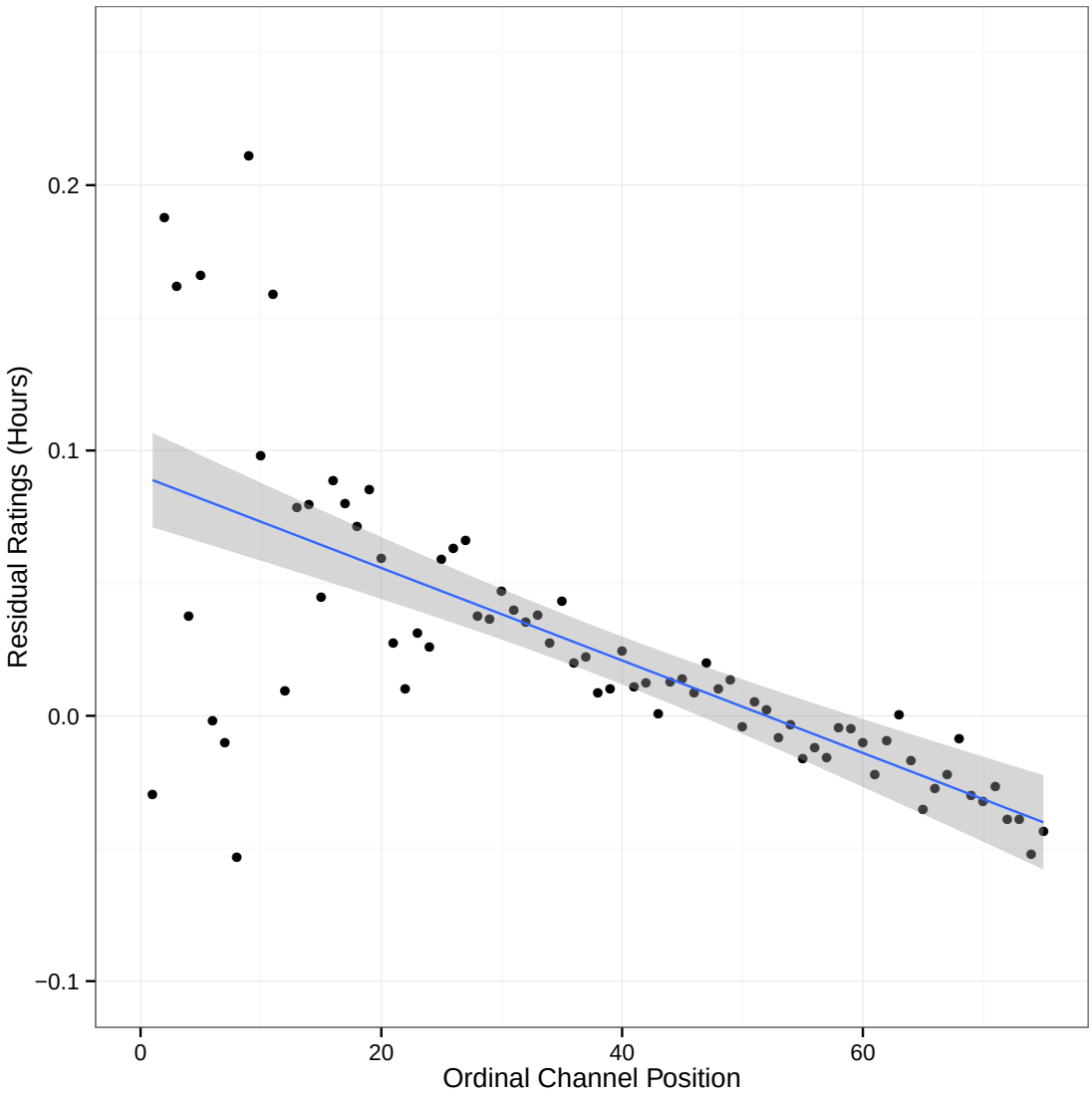


Figure 1: The relationship between the residual component of hours watched and channel position, in a set of 34 comparable cable channels whose median positions across cable system-years are between 30 and 60 and thus typically occupy similar positions to Fox News and MSNBC. Residuals are constructed by regressing hours watched per week (in the MediaMark individual-level dataset) on the full set of individual demographics plus year fixed effects. The predicting regressions are estimated separately for each channel, such that demographic effects and time trends are allowed to vary by channel. The points in the figure are averages of these residual hours across all channels located at a given ordinal position. The blue line is the least-squares fit.

the specific timing of that system's negotiations with multiple new channels as well as its decision of when to upgrade. Channels were often allocated positions sequentially, in the order in which they were added to a system.[9] Combined with the key principle in lineup design of limiting the changes in channel positions as much as possible so as to not confuse existing customers, these chaotic historical factors generated persistent cross-system variation in the positioning of Fox News and MSNBC.[10]

Figure 2 plots the growth in subscribers for a group of peer channels during this time period. The top line shows ESPN, which was available on virtually every cable system. The other channels in the graph all experienced substantial growth during this time period. Idiosyncracies in the timing of contracts and system upgrades created variation in channel positions for a given channel across locations. In some cases, if Fox News was being added to a system facing capacity constraints, its channel position was determined by the position of the channel it was replacing. On systems owned by the multiple-system operator TCI in 1996, Fox News was reported to have replaced one of as many as twelve different channels depending on the location (Dempsey (1996)).

3 Data

We use nine categories of data sets: (1) Nielsen FOCUS data on cable channel lineups by zip code by year, (2) precinct-level voting data from the 2008 Presidential election, (3) the National Annenberg Election Survey (NAES) and the Cooperative Congressional Election Study (CCES, Ansolabehere (2011)) on individual demographics, zip code, and intent to vote Republican in 2000, 2004, and 2008 U.S. Presidential elections, (4) Nielsen viewership data at the zip code level for the cable news channels from 2005 to 2008, (5) Mediamark and Simmons individual survey data on hours spent watching cable news by channel, individual demographics, and zip code, (6) County level presidential election vote share data compiled by Congressional Quarterly, (7) U.S. Census

[9] In Appendix F, we show that channel positions correlate with the best available position in the year before a channel was added.

[10] Some systems have shuffled positions over time as channels went out of business, as channel capacity expanded and as new channels came online. Some local managers pursued a strategy of moving channels with similar content or in the same genre together into "neighborhoods," when possible. In general, however, the ordering of cable channels is highly persistent from year to year: the autoregressive coefficient in a regression of channel position in year t on channel position in year $t-1$ ranges from 0.94 (MSNBC) to 0.97 (CNN).

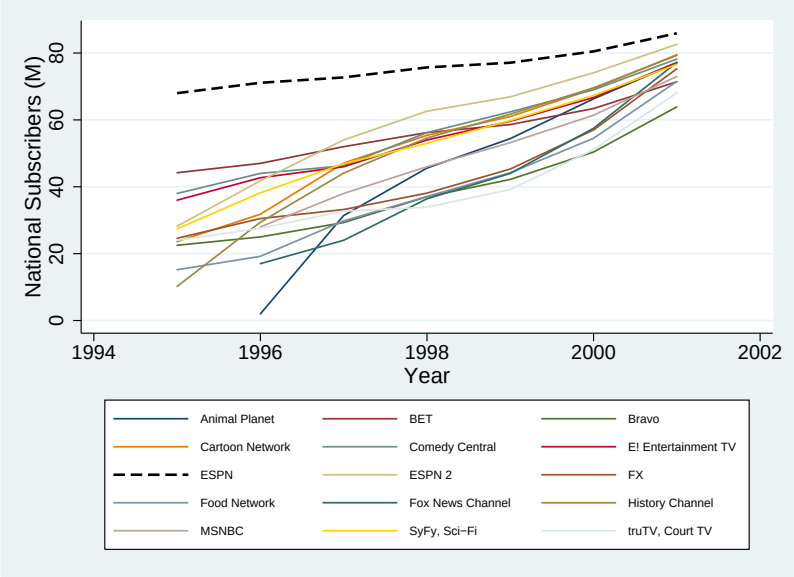


Figure 2: Number of subscribers for a group of peer channels by year for the period 1994-2001. National subscriber numbers according to SNL Kagan data.

demographics by zip code, 1996 political donation data by zip code from the Federal Elections Commissions, and the 2010 religious adherence data by county from the Religious Congregations and Membership Study (RCMS), (8) Broadcast transcripts of cable news from Lexis-Nexis, and (9) the Congressional Record. We now describe each data set and exposit several empirical relationships that are central to our results. Most of our analysis focuses on the years 2000 to 2008, but some data sets cover through 2011. In Appendix A, we provide details on how we cleaned and joined the data sets.

3.1 Cable Lineups: Nielsen FOCUS

The Nielsen FOCUS database consists of yearly observations of cable systems. The key variables in this data set are, for each system and year, the availability of CNN, Fox News, and MSNBC, the channel positions of CNN, Fox News, and MSNBC, when available, and the zip codes served by the system. In Figure 3, we document the availability of each of these news channels by year. CNN was already near-universal by 1998. Fox News and MSNBC became widespread over the sample period. Table 1 presents the mean and standard deviation of channel position for each of the three

news channel by year. CNN is generally lower than Fox, which is generally lower than MSNBC.

There are two important facts about this data set. First, the Nielsen FOCUS database contains the universe of cable systems. Second, all entries are updated on a regular basis. This feature is different from the Cable and Television Factbook used in previous studies. We detail this important difference in Appendix C.

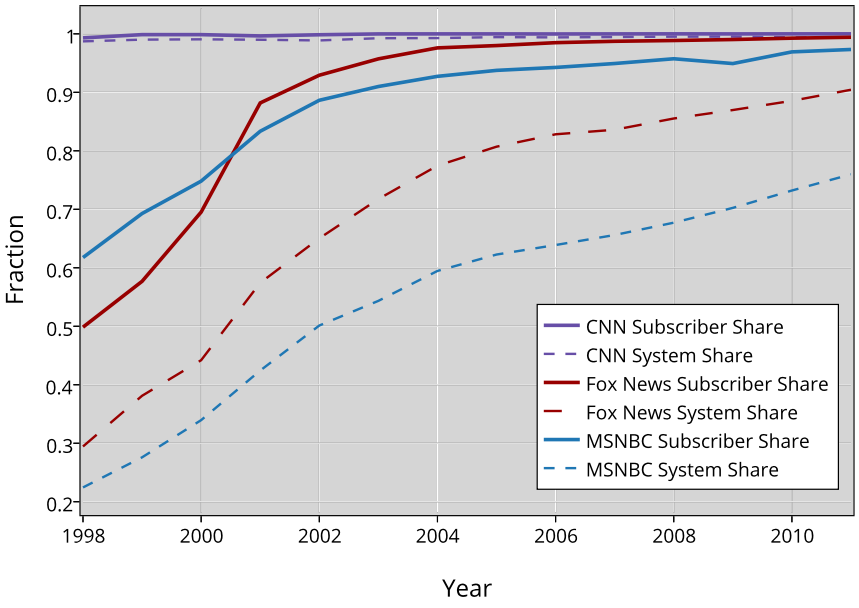


Figure 3: Availability of cable news channels by year. The solid lines represent the fraction of cable subscribers for whom the news channel was carried on their system. The dashed lines represent the fraction of cable systems which carry the news channels. By 2002, nearly all cable subscribers had access to Fox News and MSNBC.

3.2 Zip Code Level Voting Data and Demographics

We use the "Precinct-Level Election Data" from Ansolabehere et al. (2014) which provides votes cast in the 2008 Presidential election for each party, by voting precinct. We aggregate these precinct-level totals up to the zip code level, and compute the two

Year	CNN		FNC		MSNBC	
	Mean	SD	Mean	SD	Mean	SD
2000	18.30	11.03	36.98	13.59	40.91	13.24
2004	23.56	13.20	40.38	14.20	43.82	13.50
2008	26.50	14.52	39.81	14.29	45.46	18.94
2000 to 2008	22.42	13.26	39.57	14.23	43.36	14.58

Table 1: Mean and standard deviation of channel position across cable systems by news channel by year in election years, and for 2000 to 2008.

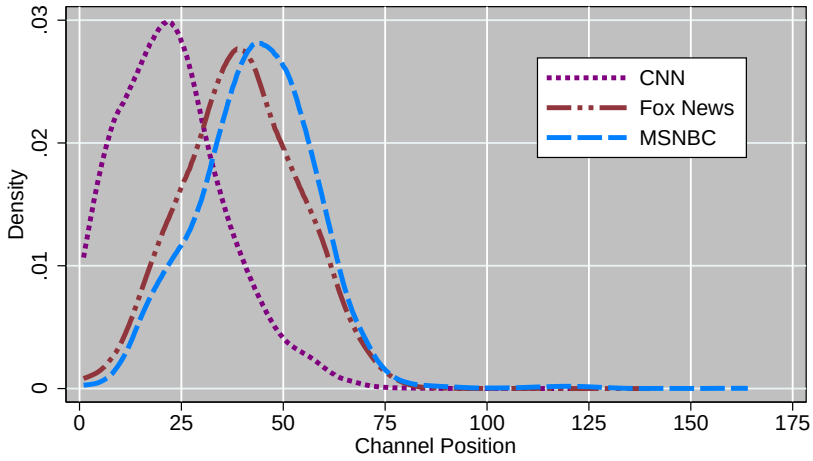


Figure 4: Kernel density estimates of distribution of channel positions by bhannel, across cable systems for 2000 to 2008.

party vote share for each zip code. We combine these with demographic data from the US Census for 2010. These data are summarized in Appendix B, Table 23.

3.3 Individual Voting Data: NAES and CCES

The National Annenberg Election Study (NAES) is a large-scale phone survey conducted each presidential election cycle which asks individual respondents a range of political preference questions, along with demographic identifiers. We use data from the 2000, 2004, and 2008 election cycles, including the confidential zip code field. The key variables are demographic variables such as race, age, and income; zip code; and actual or intent to vote in the current presidential election. The NAES surveys were conducted on a rolling basis over the course of each election, with most respondents contacted before election day but some after. We combine actual vote (from respondents contacted after election day) together with intent to vote (from those contacted before) into a single variable.

The 2004 and 2008 NAES surveys also asked respondents to report their "most watched" cable news source, if any. We use this variable in estimating OLS regressions of vote intention on channel viewership.

These data are summarized in Appendix B, Table 24. For 2008, we add data from the Cooperative Congressional Election Study (CCES) on the same variables that we use from the NAES. In all years, NAES / CCES individuals were matched to their corresponding news channel availability and positioning using their zip code of residence to identify their local cable provider in the Nielsen FOCUS data.

3.4 Zip Level Viewership Data: Nielsen

Nielsen measures television viewership from a rotating panel of households. We acquired zip code level ratings for CNN, Fox News Channel, and MSNBC from the Nielsen Local TV (NLTV) database for the years 2005 through 2008. The Nielsen data also report viewership conditional on being a cable subscriber and conditional on being a satellite subscriber. The measurements come in the units of rating points which indicate what fraction of persons were tuned in to each channel in a given time period. We convert to average hours per week by multiplying the rating by 168. These data are summarized in Appendix B, Table 25.

3.5 Individual Viewership Data: Mediamark and Simmons

Mediamark and Simmons are two commercial data vendors who survey individuals on their usage of different brands, including media usage. We use Mediamark for 2000 to 2007, and Simmons for 2008. The key variables for our study are year, zip code, individual demographics, whether the respondent subscribes to cable, satellite, or neither, and the reported number of hours watched per week of CNN, Fox News Channel, and MSNBC. These data are summarized in Appendix B, Table 26.

3.6 County Level Vote Shares and Demographics

We use county level presidential vote shares for the Presidential election in 1996 obtained from the Voting and Elections Collection Database maintained by *Congressional Quarterly*. We also use zip code level demographic statistics from the 2000 US Census. We use these data to construct county-level distributions of household income, age, race, education, and initial ideology, from which we draw a set of simulated consumer-voters for the model of section 5. For zip codes which span multiple counties, we split the zip code across the relevant counties in proportion to the county size. We also use this data to condition on the pre-Fox News county level Republican vote share in some of our regression specifications.

3.7 Broadcast Transcripts and Congressional Record

To quantify the slant of each news channel in each year, we follow Gentzkow and Shapiro (2010)[11] in comparing the language that the channels use to language that Congresspeople use. We modify their statistical procedure, and create scores for each channel for each year. This procedure does not recognize irony, satire, sub-text, nor tone, and thus likely underestimates the true dispersion in slant as the slanted outlets sometimes employ the language of the other side of political spectrum for purposes of mockery or derision.[12] We obtained broadcast transcripts for CNN, Fox News Chan-

[11]The idea is similar in spirit to Groseclose and Milyo (2005)

[12]This is one reason why we exclude Comedy Central, which features two prominent slanted cable news programs, *The Daily Show with Jon Stewart* and *The Colbert Report*, from the analysis. Their slant relies

nel, and MSNBC from the Lexis-Nexis database for the sample period 1998-2012 by downloading all transcripts per year for each identifiable cable news program from each of the three channels. Appendix D details the procedure we employ.

Each Congressperson has a measure of their ideology, derived from roll-call votes: the DW-NOMINATE score of McCarty et al. (1997), which places each Congressperson on the interval $[-1, 1]$. More positive NOMINATE scores correspond to more conservative legislators. We correlate phrase usage with the DW-NOMINATE score. There are many more two word phrases than Congresspeople, and an ordinary least squares criterion is therefore useless because there are more variables than observations. For each year, we run an Elastic Net (Zou and Hastie, 2005) regression of DW-NOMINATE score of frequency of phrase usage where an observation is a Congressperson. The Elastic Net regression is a variable selection algorithm that combines the LASSO and the Ridge Regression regularization penalties. In Table 2, we follow Gentzkow and Shapiro (2010) in showing a subset of the most indicative partisan phrases selected by the Elastic Net regression for 2000, 2004, and 2008.

We use the estimated coefficients to predict the DW-NOMINATE score for each cable news channel in each year. We then apply a three period moving average smoothing filter. The results of this procedure are in Figure 5. Fox News is consistently more conservative than the other two channels. MSNBC closely tracks CNN initially, and then becomes consistently more liberal - though by much less than the gap between CNN and Fox News - in the mid-2000's. The estimates also reveal increased polarization of cable news over time. The text based measures produce estimated ideologies for the channels that are more moderate than the median members of each party. In the modelling to come, we allow for consumers to perceive these news channels to be more or less ideologically differentiated, in proportion to these estimates. Indeed, our estimates for this scale factor put Fox News Channel very close to the median Republican voter.

heavily on satire and is not as reasonably quantified based on phrase usage. As a separate matter, Comedy Central has other highly viewed shows which are not explicitly political such as *South Park*, and our data are aggregated to the channel level.

Figure 5: Estimated Ideology by Channel-Year

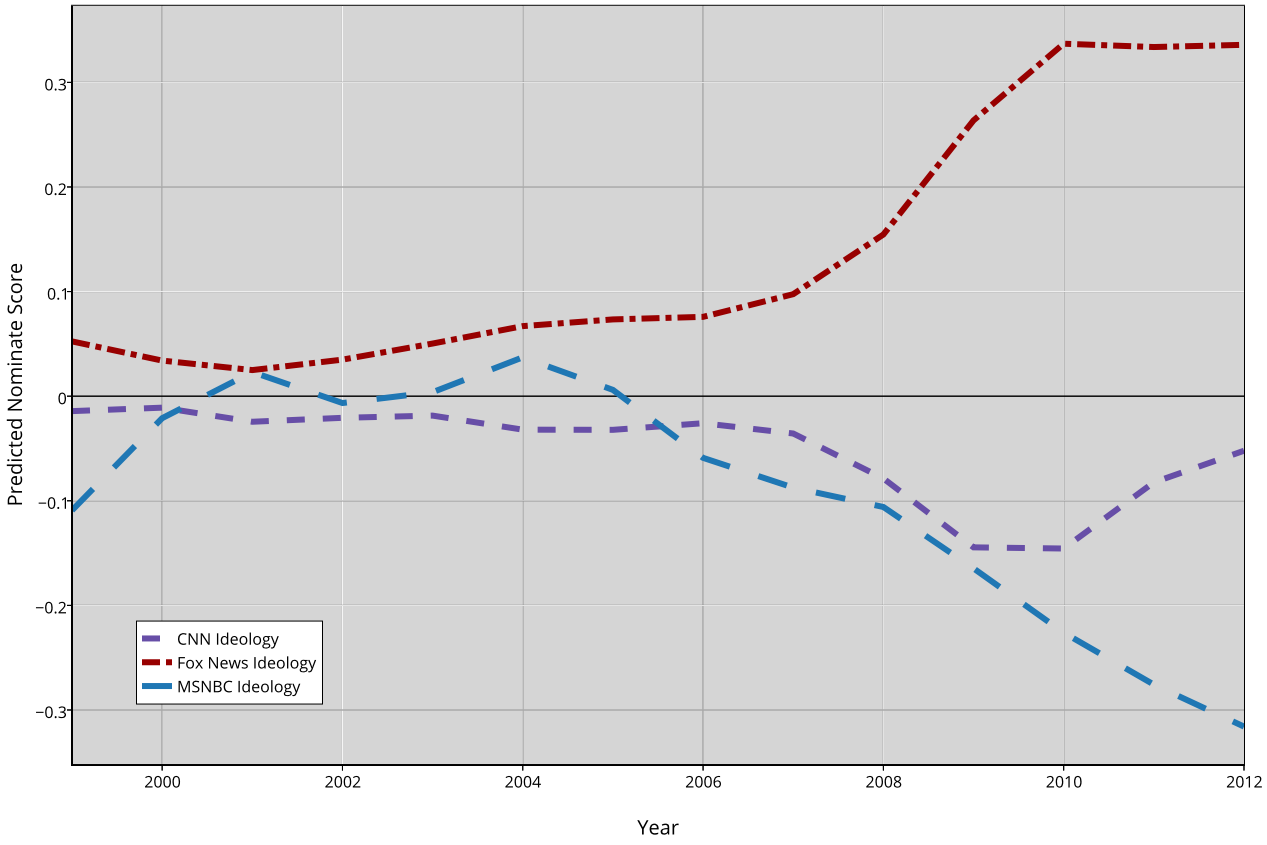


Table 2: Top 25 Partisan Phrases for Years 2000, 2004, and 2008.

2000	Party	2004	Party	2008	Party
republican leadership	D	mai 5	R	bush administr	D
clinton gore	R	ronald reagan	R	strong support	D
feder govern	R	social justic	D	african american	D
african american	D	war iraq	D	cost energi	R
civil right	D	african american	D	pass bill	D
gore administr	R	reagan said	R	will us	R
death tax	R	fail provid	D	new refineri	R
pass bill	R	illeg alien	R	civil right	D
support democrat	D	marriag licens	R	work famili	D
peopl color	D	limit govern	R	full time	D
republican propos	D	administr republican	D	democrat leadership	R
republican friend	D	presid reagan	R	democrat colleagu	R
hard earn	R	administr want	D	war iraq	D
black caucu	D	iraqi peopl	R	nuclear energi	R
republican bill	D	lost 2	D	american energi	R
congression black	D	gai lesbian	D	equal pai	D
big govern	R	administr plan	D	low incom	D
tax cut	D	presid ronald	R	presid bush	D
right organ	D	equal opportun	D	make point	R
sexual orient	D	secur plan	D	gain tax	R
american commun	D	pass bill	R	nuclear power	R
worker right	D	violenc women	D	long overdu	D
violenc countri	D	man woman	R	democrat major	R
head start	D	bush administr	D	new nuclear	R
need prescript	D	feder govern	R	bush took	D

These are the 25 phrases which have the largest absolute magnitude coefficient among those selected by the Elastic Net for the corresponding year. Word variants are stemmed to their roots.

4 Regression Analysis

In this section, we present regression results describing the relationship between cable channel positions, watching Fox News, and voting for Republican presidential candidates. These results serve as the basis for the model estimation and simulation in the following sections. However, the results in this section do not depend on the behavioral model that we specify in Section 5, and as a result this section can be read and evaluated as a stand-alone instrumental variables (IV) regression analysis.

4.1 First Stage: Viewership and Channel Position

The first stage describes how cable news viewers' hours watched vary with channel position. The idea is that lower channel positions induce more viewership for channels such as Fox News because the more popular channels tend to be in lower positions, for historical reasons.[13] A costly search model generates such a position effect. Consider a viewer who just finished watching a television program, and begins to search for a new program. Their search will begin from the channel they were watching, which is likely to be in a low position. They will move sequentially away from that channel, thereby making it more likely they stop nearer to the original channel than further away.[14] Channel position thus induces some as-if random variation in cable news viewing, unrelated to viewers' pre-existing political taste if positions are unrelated to viewers' pre-existing political taste.

The obvious worry is that cable operators might tailor their systems' channel positions to match local tastes, and make those channels that their subscribers are likely to watch more often easier to find. In section 4.3, we present a variety of evidence demonstrating that the extent of such targeting is limited, supporting the validity of the exclusion restriction. We defer these concerns for the moment and proceed first to the IV results. We present a variety of specifications which include varying degrees of

[13] In addition to the broadcast networks ABC, CBS, Fox, and NBC, the lower channel positions are generally occupied by the earliest cable entrants (eg ESPN, MTV, TNT, and USA), which also have high viewership.

[14] Bias to the top of a list or default option in search is documented in eye tracking studies for yellow pages (Lohse (1997)) and survey response (Galesic et al. (2008)). There is a theoretical literature in economics modelling such behavior (see Rubinstein and Salant (2006), Horan (2010), Masatlioglu and Nakajima (2013), and the literature on status-quo bias more generally.)

demographics and varying levels of fixed effects. All specifications condition on cable news channel availability and the total number of cable channels and broadcast channels available. These availability and number of channels variables are essential for the interpretation of higher positions causing lower viewership, and thus the exclusion restriction.[15] Additional fixed effects and demographics conceptually add credence to the assumption as well as statistical precision in some cases. However, the main coefficients do not change from specification to specification in a direction that suggests that conditioning on demographics or geographic fixed effects is essential for believing the exclusion restriction.

Table 3 presents first stage estimates of Nielsen-measured FNC viewership on the position of FNC.[16] This set of viewership data spans all states and the years 2005 to 2008. The estimating equations for a news channel c take the form:

$$h_{zt}^{c} = \delta_{ct} + a_{zct} + \alpha_c x_{zt} + \zeta_{c,FNC} p_{zt}^{FNC} + \zeta_{c,MSNBC} p_{zt}^{MSNBC} + \epsilon_{zct}^{H} \quad (1)$$

where h_{zt}^{c} is the average hours watched per week of all Nielsen households in zip code z in year t; δ_{ct} are channel fixed effects, which are allowed to vary by year, state-year, or county-year depending on the specification; p_{zt}^{j} is the cable channel position of channel j in zip code z in year t; x_{zt} are average demographic characteristics of zip code z; and a_{zct} are dummy variables for cable availability of the cable news channels in zip code z in year t.

Columns (1) - (5) of Table 3 show variants of this model with different sets of conditioning variables and fixed effects. We report specifications with year fixed effects, state-year fixed effects, and county-year fixed effects. The primary covariate of interest in these regressions - channel position - varies at the level of the cable system, which

[15] Availability is essential as we assign a position of zero when the channel is not available, thus ignoring availability would make channel position pick up the effect of availability. The number of channels variables are essential because some areas have more broadcast channels than others. This can happen in areas which are close to two different metropolitan centers, or in large population centers compared to small metro areas. Since broadcast channels typically come first in the line up, they push up all positions of cable channels.

[16] The left-hand side here includes viewership among both cable- and satellite-subscribing households, even though satellite viewers get a different, nation-wide, lineup set by the satellite provider. Section 4.3 uses this distinction to conduct placebo tests of cable positions' effect on satellite viewership. Our main specifications pool the subscriber types together to match the population in the second-stage datasets, which do not include an identifier for TV package subscription.

may span multiple zip codes. We therefore present cluster-robust standard errors in all specifications, using cable system as the cluster variable. Our preferred specification is column (4), which includes state-year fixed effects and an extensive set of demographic covariates that correlate with Republican voting and residential sorting, including measures of Republican voting and donations from 1996, effectively before Fox News.[17]

In Column (4), cable positions of both FNC and MSNBC significantly predict viewership of FNC, in the expected directions. A one standard deviation increase in FNC channel position predicts a decrease in average viewership of about two and one-half minutes per week. Within-county variation in channel position is somewhat limited, and hence power suffers when county-year fixed effects are added, but the effect magnitude is quite similar across varying combinations of demographic controls and fixed effects. The cluster-robust F statistic for the ordinal FNC position is maximized at 29 in the specification with state-year fixed effects and extensive demographics. For our baseline single-instrument and thus just-identified specification, these results suggest that the instrument is strong enough to proceed with standard 2SLS inference in the zip code level data.

Column (6) of the table adds an additional variable: the hours per week of FNC viewership reported by Nielsen among *satellite* subscribers only, in the same zip code. To the extent that satellite and cable subscribers in the same zip code have similar tastes for the news channels, conditioning on satellite viewership controls for unobserved variation in taste for FNC which, if it were correlated with channel position, would bias the estimates of the position effects. Comparing columns (4) and (6) reveals

[17]The set of basic demographic variables are zip code level fractions of the population that is black, Hispanic, Asian, and some other race; the male fraction of the population; population percentages for each 10-year age range; percentage urban and neither urban nor rural; log population density; the fraction of the population whose highest level of educational attainment is a high school degree, some college, a bachelor's degree, or a post-graduate degree; and dummy variables for each decile of median household income. The extensive demographics add the percentage of residents who own their home; median home value, median property tax rate, percentage of homes built in 2005 or after, and median number of rooms per home; the percentage of the population receiving food stamps; median social security income; the percentage of married households, same-sex partner households, unmarried households, and family households; the percentage of veterans; the fraction of 1996 federal campaign contributions from the zip code going to Republican candidates; the county's Republican vote share in the 1996 presidential election; and county level rates of church attendance for all mainline denominations, evangelical denominations, Catholic, Jewish, Mormon, and the Southern Baptist Convention.

that the position coefficients are essentially unchanged with the addition of conditioning on same-zip code satellite hours.

Table 4 presents the analogous results using the individual-level data from Media-Mark. In this version, we are able to include demographic characteristics measured at the individual level in addition to the full set of extensive zip level demographic measures. Estimating equations here take the form:

$$h^c_{izt} = \delta_{ct} + a_{zct} + \alpha^1_c x_{zt} + \alpha^2_c x_{it} + \zeta_{c,FNC} p^{FNC}_{zt} + \zeta_{c,MSNBC} p^{MSNBC}_{zt} + \epsilon^H_{ict} \quad (2)$$

Again, the FNC channel position correlates negatively with viewership, with very similar magnitude as in the independently sampled zip code level data. Unfortunately, because the individual level data span only about one-half as many clusters (cable systems) as the zip-code level data, the cluster-robust F statistics fall below ten in most cases, and the instrument loses power entirely when county-year fixed effects are included. The sample in Table 4 includes all respondents, including satellite subscribers and those who subscribe to neither wired cable nor satellite television. We use the pooled-sample first stage because the second stage dataset lacks information on individuals' subscription choices. Section 4.3 presents a first stage estimated among cable subscribers alone; among cable subscribers, the individual-level position effect is precise and consistently negative.

There are two factors which temper the threat of misleading inference due to weak instruments in the second stage. First, we are using a single instrument in the just-identified case. Second, recalling the two-sample nature of the individual data, the intent-to-vote data span many more clusters than the viewership data.

First stage results with MSNBC viewership on the left-hand side of equations (1) and (2) are very similar, though the direction of coefficients on FNC and MSNBC positions are reversed. The power of channel positions for predicting MSNBC viewership is generally even higher than for FNC. For brevity, we relegate these results to Appendix E, Tables 34 and 35.

Table 3: First Stage Regressions: Nielsen Data

	FNC Hours Per Week					
	(1)	(2)	(3)	(4)	(5)	(6)
FNC Cable Position	-0.003^{***}	-0.002^{***}	-0.003^{***}	-0.003^{***}	-0.002	-0.003^{***}
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.0004)
MSNBC Cable Position	0.001^{**}	0.001^{**}	0.001^{***}	0.001^{**}	0.001	0.001^{***}
	(0.001)	(0.001)	(0.001)	(0.0005)	(0.001)	(0.0004)
System has MSNBC Only	0.078	0.068	0.062	0.027	0.031	0.028
	(0.093)	(0.090)	(0.089)	(0.121)	(0.183)	(0.087)
System has FNC Only	0.458^{***}	0.428^{***}	0.393^{***}	0.407^{***}	0.252^{***}	0.349^{***}
	(0.042)	(0.041)	(0.038)	(0.044)	(0.055)	(0.032)
System has Both	0.369^{***}	0.364^{***}	0.312^{***}	0.309^{***}	0.204^{***}	0.233^{***}
	(0.047)	(0.047)	(0.042)	(0.048)	(0.071)	(0.033)
Sat. FNC Hours						0.315^{***}
						(0.016)
Fixed Effects:	Year	State-Year	State-Year	State-Year	County-Year	State-Year
Cable Controls:	Y	Y	Y	Y	Y	Y
Demographics:	None	None	Basic	Extended	Extended	Extended
Robust F-Stat	16.8	11.5	25.6	29	2.5	37.1
Number of Clusters	5826	5826	5816	4848	4848	4761
N	73,488	73,488	73,317	61,141	61,141	52,053
R^2	0.011	0.025	0.056	0.071	0.296	0.397

$^{*}p < .1$; $^{**}p < .05$; $^{***}p < .01$

Notes: Cluster-robust standard errors in parentheses (clustered by cable system). Instrument is the ordinal position of FNC on the local system. The omitted category for the availability dummies is systems where neither FNC nor MSNBC is available. In Column (5), the specification conditions on the average FNC ratings among satellite subscribers in the same zip code. Cable system controls include the total number of channels on the system and the number of broadcast channels on the system, as well as an indicator for Nielsen collection mode (diary vs. set-top). "Basic" demographics include the racial, gender, age, income, educational, and urban/rural makeup of the zip code. "Extended" demographics adds information on the percentage of homeowners; median housing values, sizes, ages, and property tax rates; the fraction of the population receiving food stamps; median social security income; the fraction of veterans; the fractions of married, unmarried, and same-sex couples; the share of federal campaign contributions that went to Republican candidates in 1996; the Republican presidential share of the county in 1996; and the religious composition of the county.

Table 4: First Stage Regressions: Mediamark / Simmons Data

	FNC Hours per Week					
	(1)	(2)	(3)	(4)	(5)	(6)
FNC Cable Position	−0.001	−0.002*	−0.002**	−0.002**	0.0002	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
MSNBC Cable Position	0.001	0.001	0.0004	0.001	−0.0005	−0.0002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
HH Income			0.726***	0.660***	0.673***	0.614***
			(0.050)	(0.049)	(0.051)	(0.051)
HH Income^2			−0.312***	−0.280***	−0.286***	−0.261***
			(0.027)	(0.027)	(0.028)	(0.027)
HH Income^3			0.033***	0.029***	0.030***	0.028***
			(0.003)	(0.003)	(0.003)	(0.003)
Age Quintile 2			0.183***	0.174***	0.177***	0.173***
			(0.016)	(0.017)	(0.016)	(0.017)
Age Quintile 3			0.364***	0.351***	0.353***	0.348***
			(0.017)	(0.018)	(0.018)	(0.019)
Age Quintile 4			0.525***	0.510***	0.516***	0.508***
			(0.019)	(0.020)	(0.020)	(0.021)
Age Quintile 5			1.071***	1.042***	1.047***	1.026***
			(0.025)	(0.025)	(0.025)	(0.025)
White			0.187***	0.164***	0.185***	0.180***
			(0.019)	(0.021)	(0.020)	(0.021)
Black			0.150***	0.179***	0.200***	0.217***
			(0.031)	(0.029)	(0.029)	(0.029)
Hispanic			−0.189***	−0.142***	−0.166***	−0.140***
			(0.025)	(0.023)	(0.023)	(0.023)
College Degree			−0.128***	−0.103***	−0.112***	−0.107***
			(0.016)	(0.016)	(0.016)	(0.017)
Man			0.176***	0.176***	0.177***	0.179***
			(0.013)	(0.014)	(0.014)	(0.014)
Fixed Effects:	Year	State-Year	State-Year	State-Year	County-Year	County-Year
Cable Controls:	Y	Y	Y	Y	Y	Y
Demographics:	None	None	Individual	Extensive	Individual	Extensive
Robust F-Stat	2.1	3.2	4	5.7	0.1	0.4
Number of Clusters	2589	2589	2589	2379	2589	2379
N	207,950	207,950	207,860	197,551	207,860	197,551
R^2	0.010	0.016	0.039	0.042	0.074	0.075

*p < .1; **p < .05; ***p < .01

Cluster-robust standard errors in parentheses (clustered by cable system). Instrument is the ordinal position of FNC on the local system. The omitted category for the availability dummies is systems where neither FNC nor MSNBC is available. Cable system controls include the total number of channels on the system and the number of broadcast channels on the system. "Individual" demographics are measured at the level of the individual respondent. "Extensive" demographics include all of the same individual-level measures plus all of the zip-code-level demographics included in the zip-code-level analysis.

4.2 Second Stage: Voting and Viewership

Next, we present both zip code-level and individual-level second stage regression results, in Tables 5 and 6. The zip code-level regressions take the form:

$$y_{zt} = \gamma_t + a_{zt} + \beta x_{zt} + \rho_f h^f_{zt} + \epsilon^V_{zt} \tag{3}$$

Where y_{zt} is Republican vote share in zip code z in election t, γ_t are (state-)election fixed effects, a_{zt} are indicators for availability of the channels, and β are coefficients on zip code demographics x_{zt}. We are interested in the coefficient ρ_f on the zip code's predicted average hours watched per week of the Fox News Channel, h^f_{zt}. Predicted hours are produced by the first stage estimates presented in Table 3.

The individual-level regressions are directly analogous, with the exception that the outcome y_{izt} is now an indicator for whether individual i states their intention to vote for the Republican presidential candidate in the election of year t:

$$y_{izt} = \gamma_t + a_{it} + \beta^1 x_{it} + \beta^2 x_{zt} + \rho_f h^f_{it} + \epsilon^V_{it} \tag{4}$$

Predicted hours in the individual-level regression is produced by the first-stage estimates in Table 4.

In both versions, we compute standard errors by a bootstrap, as deemed appropriate in two-sample IV settings by Inoue and Solon (2010). We use a cluster-robust block bootstrap at the level of cable systems to allow for correlation across zip codes and over time within cable systems.[18] Our estimates imply that being induced to watch an additional hour per week of Fox News by the channel position instrument would lead to an approximately 8 to 14-point increase in the probability of voting Republican in presidential elections for those induced into watching by the instrument. The most precise estimates are from the zip code sample, and are at the lower end of this range. The typical change in viewership induced by the instrument is significantly less than one hour per week. Given our first-stage estimates and the distribution of the instrument

[18] We resample with replacement from the set of cable systems in the data, with independent resamples drawn for the viewership and the voting data.

presented in Figure 4, a one standard deviation increase in channel position induces a roughly 2.5-minute-per-week increase in Fox News viewing. The implied change in probability of voting for the Republican candidate from a one standard deviation increase in channel position is thus -0.3 to -0.6 points.

Table 5: Second Stage Regressions: Precinct Voting Data

	2008 McCain Vote Share		
	(1)	(2)	(3)
Pred. Cable FNC Hrs.	0.089**	0.090***	0.076**
	(0.001, 0.204)	(0.034, 0.179)	(0.008, 0.159)
Satellite FNC Hrs.			−0.023**
			(−0.047, −0.001)
Fixed Effects:	State-Year	State-Year	State-Year
Cable System Controls:	Y	Y	Y
Demographics:	Basic	Extended	Extended
Number of Clusters	6029	4814	3993
N	22,509	17,400	12,417
R^2	0.730	0.833	0.841

*p < .1; **p < .05; ***p < .01
The first stage is estimated using viewership data for all Nielsen TV households. See first stage tables for description of instruments and control variables. Confidence intervals are generated from 500 independent STID-block-bootstraps of the first and second stage datasets. Reported lower and upper bounds give the central 95 percent interval of the relevant bootstrapped statistic.

Comparing the two versions, the point estimate of the second-stage coefficient on FNC viewing is higher in the individual-level regression. It is also much less precise, however; the individual-level confidence interval entirely covers the zip code-level confidence interval. This difference is reflective of both the greater power of the instrument in the zip code-level first stage and the much greater predictability of zip code-level Republican vote shares as opposed to individual vote intentions: R^2 values in the zip code-level reduced form regression approach 0.85, as compared to 0.15 in the corresponding individual-level regression.

Within Table 5, the second-stage coefficient is essentially unaffected by the inclusion of the extensive demographic set, which among other things includes pre-treatment indicators of partisan preference like the county level Republican presidential vote share in 1996 and the share of campaign contributions to Republican candidates in 1996. It declines slightly, but remains positive and significantly different from zero, when Fox News Channel hours among satellite subscribers in the same zip code are included as a covariate. Both of these facts lend some credence to the idea that channel

Table 6: Second Stage Regressions: NAES / CCES Data

	P(Vote for Republican Presidential Candidate)		
	(1)	(2)	(3)
Pred. FNC Hrs.	0.110	0.203	0.138
	(−1.228, 1.664)	(−0.628, 1.249)	(−0.032, 0.678)
HH Income		0.336	0.325
		(−0.410, 0.899)	(−0.039, 0.465)
HH Income^2		−0.309	−0.277
		(−0.566, 0.022)	(−0.360, −0.125)
HH Income^3		0.084	0.074
		(0.044, 0.115)	(0.052, 0.093)
Age Quintile 2		−0.007	−0.001
		(−0.204, 0.148)	(−0.094, 0.033)
Age Quintile 3		−0.043	−0.028
		(−0.421, 0.271)	(−0.229, 0.032)
Age Quintile 4		−0.103	−0.076
		(−0.665, 0.347)	(−0.361, 0.010)
Age Quintile 5		−0.189	−0.123
		(−1.312, 0.720)	(−0.698, 0.051)
White		0.054	0.056
		(−0.167, 0.195)	(−0.026, 0.085)
Black		−0.384	−0.354
		(−0.557, −0.250)	(−0.445, −0.316)
Hispanic		−0.043	−0.056
		(−0.204, 0.171)	(−0.084, 0.009)
College Degree		−0.058	−0.048
		(−0.169, 0.082)	(−0.068, 0.002)
Man		0.039	0.051
		(−0.158, 0.173)	(−0.045, 0.082)
Fixed Effects:	State-Year	State-Year	State-Year
Cable Controls:	Y	Y	Y
Demographics:	None	Individual	Extensive
Number of Clusters	6659	6523	5540
N	134,970	122,738	116,009
R^2	0.029	0.112	0.137

The first stage is estimated on all MediaMark/Simmons respondents. See first stage tables for description of instruments and control variables. Confidence intervals are generated from 500 independent STID-block-bootstraps of the first and second stage datasets. Reported lower and upper bounds give the central 95 percent interval of the relevant bootstrapped statistic. "Individual" demographics are measured at the level of the individual respondent. "Extensive" demographics include all of the same individual-level measures plus all of the zip-code-level demographics included in the zip-code-level analysis.

position is not simply picking up local variation in unobserved political tastes, a point we expand upon in section 4.3.

In the specification with satellite hours, the coefficient on satellite hours is negative, a result that may seem counter-intuitive. The reason for this is that predicted hours are estimated using the pooled first-stage regression; hence, predicted hours here are predicted *total* hours, across both cable and satellite subscribers. The negative coefficient on satellite hours implies that, *holding total FNC hours watched constant*, the effect on vote shares is smaller, the more of those hours that come from satellite as opposed to cable subscribers. One explanation for this pattern is that the IV "compliers" in this application are all cable subscribers. If effects of news viewership are heterogeneous, the IV estimate for total hours may differ from the OLS estimate for satellite hours.

An examination of the analogous OLS regression for total hours bears out this conclusion. Table 7 presents the zip code level OLS results.[19] The OLS coefficient on Fox News Channel hours is significant and positive, as expected, but it is much smaller in magnitude than the corresponding IV coefficients. This is due to at least two factors: first, the zip code level viewership levels are estimates based on samples which would lead to classical measurement error and attenuated OLS coefficients. Second, as the behavioral model makes clear, we are estimating a single coefficient in a world of heterogeneous treatment effects. The IV coefficient measures the local average treatment effect on zip codes whose viewership levels are affected by channel position. The OLS estimate, on the other hand, averages across all zip codes in the sample, weighting most heavily those with unusually high or low Republican vote share. It is reasonable to suspect that the complier zip codes are more centrist relative to the outlier zip codes, and thus subject to larger persuasion effects: those whose choice among ideological news channels is most susceptible to influence by channel position are also likely to be those whose pre-existing ideological attachments are relatively weak. Additionally, the complier zip codes are likely to have lower base levels of Fox viewing, which, if there are diminishing marginal effects of cable news viewing, would lead to higher average partial effects measured in this subsample.

Finally, Tables 8 and 9 present the reduced form for the zip and individual level data. Fox News position is significantly negatively correlated with zip code 2008 Re-

[19]Because of the two-sample nature of the individual level data, it is not possible to run the analogous OLS regression in the individual level data.

Table 7: OLS Regressions: Precinct Voting Data

	2008 McCain Vote Share					
	(1)	(2)	(3)	(4)	(5)	(6)
FNC Hours	0.012***	0.010***	0.003***	0.003***	0.002***	0.002***
	(0.002)	(0.001)	(0.001)	(0.0005)	(0.0004)	(0.0005)
MSNBC Cable Position	0.0005***	0.0004**	0.00001	0.00004	−0.0001	−0.00004
	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Fixed Effects:	Year	State-Year	State-Year	State-Year	County-Year	County-Year
Cable System Controls:	Y	Y	Y	Y	Y	Y
Demographics:	None	None	Basic	Extended	Basic	Extended
Number of Clusters	5004	5004	5004	4229	5004	4229
N	17,509	17,509	17,507	14,707	17,507	14,707
R^2	0.167	0.301	0.758	0.844	0.899	0.917

*p < .1; **p < .05; ***p < .01
Cluster-robust standard errors in parentheses (clustered by cable system). See first stage tables for description of instruments and control variables.

publican vote share in all specifications which include demographic covariates. With the individual level data, these correlations are only significant in the specifications with state-year fixed effects; due to the relatively small number of clusters in this sample there is insufficient within-county variation to estimate the position effects precisely.

Table 8: Reduced Form Regressions: Precinct Voting Data

	2008 McCain Vote Share					
	(1)	(2)	(3)	(4)	(5)	(6)
FNC Cable Position	−0.0001	0.00004	−0.0002**	−0.0003***	−0.0002**	−0.0001*
	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
MSNBC Cable Position	0.001***	0.0004***	0.0001	0.0001	0.00003	0.00003
	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Fixed Effects:	Year	State-Year	State-Year	State-Year	County-Year	County-Year
Cable System Controls:	Y	Y	Y	Y	Y	Y
Demographics:	None	None	Basic	Extended	Basic	Extended
Number of Clusters	6035	6035	6029	4814	6029	4814
N	22,584	22,584	22,509	17,400	22,509	17,400
R^2	0.148	0.294	0.730	0.833	0.880	0.907

*p < .1; **p < .05; ***p < .01
Cluster-robust standard errors in parentheses (clustered by cable system). See first stage tables for description of instruments and control variables.

Table 9: Reduced Form Regressions: NAES / CCES Data

	P(Vote for Republican Presidential Candidate)					
	(1)	(2)	(3)	(4)	(5)	(6)
FNC Cable Position	−0.0003	−0.0002	−0.0003*	−0.0002*	−0.0004	−0.0002
	(0.0003)	(0.0002)	(0.0002)	(0.0001)	(0.0002)	(0.0002)
MSNBC Cable Position	0.001***	0.0002	0.0001	0.0001	−0.0003*	−0.0005***
	(0.0003)	(0.0002)	(0.0002)	(0.0001)	(0.0002)	(0.0002)
HH Income			0.481***	0.414***	0.452***	0.398***
			(0.026)	(0.027)	(0.027)	(0.028)
HH Income^2			−0.370***	−0.313***	−0.341***	−0.298***
			(0.030)	(0.030)	(0.031)	(0.032)
HH Income^3			0.090***	0.077***	0.083***	0.073***
			(0.009)	(0.009)	(0.009)	(0.010)
Age Quintile 2			0.030***	0.023***	0.028***	0.025***
			(0.005)	(0.005)	(0.005)	(0.006)
Age Quintile 3			0.031***	0.020***	0.028***	0.022***
			(0.005)	(0.005)	(0.005)	(0.005)
Age Quintile 4			0.003	−0.007	0.001	−0.003
			(0.005)	(0.005)	(0.006)	(0.006)
Age Quintile 5			0.027***	0.019***	0.028***	0.023***
			(0.005)	(0.005)	(0.005)	(0.005)
White			0.092***	0.079***	0.083***	0.079***
			(0.006)	(0.006)	(0.006)	(0.006)
Black			−0.353***	−0.329***	−0.338***	−0.322***
			(0.009)	(0.010)	(0.010)	(0.010)
Hispanic			−0.082***	−0.076***	−0.075***	−0.076***
			(0.008)	(0.008)	(0.009)	(0.008)
College Degree			−0.084***	−0.062***	−0.070***	−0.062***
			(0.004)	(0.004)	(0.004)	(0.004)
Man			0.074***	0.075***	0.075***	0.075***
			(0.003)	(0.003)	(0.003)	(0.003)
Fixed Effects:	Year	State-Year	State-Year	State-Year	County-Year	County-Year
Cable Controls:	Y	Y	Y	Y	Y	Y
Demographics:	None	None	Individual	Extensive	Individual	Extensive
Number of Clusters	6739	6739	6605	5582	6605	5582
N	135,574	135,574	123,297	116,465	123,297	116,465
R^2	0.012	0.029	0.112	0.137	0.188	0.197

*p < .1; **p < .05; ***p < .01

Cluster-robust standard errors in parentheses (clustered by cable system). "Individual" demographics are measured at the level of the individual respondent. "Extensive" demographics include all of the same individual-level measures plus all of the zip-code-level demographics included in the zip-code-level analysis.

The MSNBC position coefficient in the reduced form tables is generally positive but, unsurprisingly given MSNBC's substantially lower viewership, much less precise and less robust across specifications compared to the FNC reduced form. In addition, the ideological estimates in Figure 5 put MSNBC, even in 2008, at a relatively centrist position compared to Fox News. Prior to 2006, MSNBC is generally to the right of CNN. This asymmetry with Fox News, which is consistently right-wing throughout the sample period, helps explain the limited predictive power of the MSNBC position reduced form, particularly in the individual data which pools across the 2000, 2004 and 2008 elections, though interestingly the specification with county level fixed effects predicts that lower MSNBC position increases Republican intent-to-vote in the individual level sample.

For comparison purposes we include, in Appendix E, an analogous specification to those in Tables 5 and 6 where MSNBC viewership is the endogenous variable, as well as a dual-instrument version where FNC and MSNBC viewership are both treated as endogenous and instrumented by the combination of FNC and MSNBC positions. The second-stage MSNBC hours coefficient is negative, though smaller in magnitude than the analogous FNC coefficient, in the single-instrument specification, but becomes insignificant and in some cases positive in the dual-instrument version where predicted FNC hours are also included. The second stage FNC hours coefficient remains positive, significant, and of similar magnitude in this specification. We conclude that while there is some suggestive evidence of a MSNBC persuasive effect, it is much weaker and less robust than the evidence for FNC. Accordingly, we fit the behavioral model in section 5 using only the information from the single-instrument second stage results for Fox News.

4.3 Instrument Validity Support

In this section, we defend the as-if random assignment of the channel position instrumental variables assumption with two targeted tests.[20] We first correlate local cable positions with a variety of observables including the predictable-by-demographics variation in Republican vote share, predictable-by-demographics variation in Fox News

[20]In Appendix F, we present additional tests including whether future Fox News positions predict current viewership, conditional on current position.

viewership, pre-treatment indicators of political preference, such as a zip code's share of political contributions that went to Republican candidates in the 1996 election, before the roll out of Fox News, and the viewership by satellite subscribers in the same zip code, compared to cable subscribers. While these variables are included in our preferred specifications, we follow Pischke and Schwandt (2014) in moving them to the left-hand side to assess our identifying assumptions.

Along the same lines, we demonstrate that the coefficient on FNC position in both the first stage and the reduced form does not change appreciably when we add or remove covariates which are highly indicative both of watching Fox News and of voting Republican. If channel positions were targeted to match local tastes, one would expect these coefficients to fall in magnitude as we add obvious targeting variables to the specifications. In fact, the actual pattern is the opposite: the FNC position coefficient becomes *more* negative when factors that are highly predictive of tastes for Republican candidates are added to the specification. A proportional-selection analysis along the lines of Oster (2014) would lead to the conclusion that in order for the reduced form to be explained by selection, cable operators must be targeting using factors that are negatively correlated with observable predictors of zip code ideology.

Second, we estimate the 2SLS coefficients using a first stage that is fit on cable subscribers alone. Because the voting data is pooled across respondents who subscribe to cable, satellite, or no TV at all, under the assumption of exogenous positions the second stage coefficient in this version is attenuated in proportion to the fraction of the population who subscribe to cable.[21] If positions are correlated with unobservable political tastes, however, this version will be biased towards matching the pooled-first-stage coefficients presented in Tables 5 and 6. We show that the ratio between the two sets of coefficients almost exactly matches the population fraction of cable subscribers, consistent with the as-if random assumption.

The first row of Table 10 shows the relationship of Fox News cable position with *observable* variation in local taste for Fox News. The left hand side here is predicted hours watched of Fox News, using only demographic information as covariates; predicted hours are then regressed on Fox News cable position. The relationship here is positive in both data sets, but the magnitude is substantially larger in the zip code level data. For assessing the identifying assumption, positive estimates are re-assuring

[21] This relationship is derived formally in Appendix G.

Table 10: FNC cable position coefficient on predicted viewing / voting, and 1996 voting and contributions.

	Individual		Zip	
Predicted Viewing	0.00016	0.00011	0.00061*	0.00081**
	(0.00025)	(0.00045)	(0.00031)	(0.00038)
Predicted Voting	0.00017	0.00006	0.00036**	0.00027
	(0.00011)	(0.00022)	(0.00016)	(0.00022)
1996 County R Vote Share	−0.00009	−0.00014	0.00014	−0.00008
	(0.00024)	(0.00014)	(0.00013)	(0.00012)
1996 Zip R Contrib Share	0.00017	0.00013	0.00033	0.00020
	(0.00035)	(0.00021)	(0.00022)	(0.00020)
Covariate Set	Individual	Extensive	Basic	Extensive

*p < .1; **p < .05; ***p < .01
Cluster-robust standard errors in parentheses (clustered by cable system). Rows 1 and 2 regress predicted hours of FNC and predicted Republican vote share, respectively, on FNC cable position. The predicting regressions exclude FNC position but include the indicated set of demographic controls. Rows 3 and 4 regress indicators of pre-treatment political attitudes (1996 county-level Republican presidential vote share and 1996 zipcode-level Republican campaign contribution share) on FNC cable position.

as they indicate the Fox News positions are higher in locations with observable demographics which predict more Fox News viewing.

The placebo test described thus far asks if Fox News' channel position is correlated with the error in the viewing equation. We can also ask if channel position correlates with the error in the *voting* equation; both correlations are needed to bias the 2SLS estimate of the Fox effect on political preference. The remaining rows of Table 10 show some additional placebo tests that aim to test for this correlation directly.

The second row of Table 10 regresses the predicted voting outcome[22] from a regression of vote preference that excludes position, on Fox News cable position. This predictable component of variation in political preference has a correlation with Fox position that is again positive, though generally not significantly different from zero. I.e., Fox's position in cable territories that are expected to be more Republican given observables is, if anything, slightly worse than average. Rows 3 and 4 conduct a similar exercise, replacing the left-hand side with indicators of political preference that predate

[22]The left-hand side variable is either an indicator for Republican presidential vote in the individual data, or Republican presidential vote share in the zip code data.

Fox's arrival: the share of federal campaign contributions from the zip code that went to Republican candidates in 1996, and the (county-level) Republican presidential vote share in 1996. The idea here is to test the conjecture that cable position proxies for pre-treatment variation in political tastes. Again, the majority of the correlations are positive (the opposite direction from the reduced form), and none differs significantly from zero.

Table 11: Comparison of covariate groups' influence on viewing equation, voting equation, and the first stage coefficient estimate: Nielsen Data.

	R^2 Change (Viewing)	R^2 Change (Voting)	First Stage	Reduced Form
Race	0.00168	0.07527	-0.00291^{***}	-0.00019^{**}
			(0.00055)	(0.00009)
Age	0.00793	0.00293	-0.00265^{***}	-0.00025^{***}
			(0.00056)	(0.00008)
Education	0.00195	0.00708	-0.00297^{***}	-0.00030^{***}
			(0.00055)	(0.00008)
Marital Status	0.00124	0.01221	-0.00293^{***}	-0.00034^{***}
			(0.00055)	(0.00009)
1996 Voting / Contribs.	0.01227	0.05596	-0.00269^{***}	-0.00023^{**}
			(0.00053)	(0.00009)
Religion	0.00030	0.00522	-0.00290^{***}	-0.00022^{**}
			(0.00055)	(0.00008)
(No Demographics)	0.04570	0.53969	-0.00211^{***}	0.00004
			(0.00062)	(0.00020)
(Complete Set)	0.00000	0.00000	-0.00294^{***}	-0.00027^{***}
			(0.00055)	(0.00008)
Number of Clusters	4848	4814	4848	4814
N	61,141	17,400	61,141	17,400

$^{*}p < .1$; $^{**}p < .05$; $^{***}p < .01$

Cluster-robust standard errors in parentheses (clustered by cable system). The first two columns are the decrease in R^2 resulting from excluding all variables in the listed group from the viewership and the voting regressions, respectively, relative to the value for the model with the complete (extended) set of controls. The third column shows the estimated first stage coefficient on FNC position when the corresponding group of demographic variables is excluded from the equation. The final column is the same exercise, for the reduced form equation. All regressions include the "Extended" demographic set, with the exception of the indicated group of variables, plus state-year fixed effects.

Along the same lines, in Tables 11 and 12, we show that the coefficients on FNC position in both the first stage viewership regression and the reduced form do not change as we add or remove subsets of variables that are highly predictive of both vot-

Table 12: Comparison of covariate groups' influence on viewing equation, voting equation, and the first stage coefficient estimate: Mediamark / Simmons Data

	R^2 Change (Viewing)	R^2 Change (Voting)	First Stage	Reduced Form
Zip Race	0.00004	0.00051	-0.00184^{**}	-0.00025^{*}
			(0.00075)	(0.00013)
Zip Age	0.00020	0.00058	-0.00174^{**}	-0.00025^{*}
			(0.00075)	(0.00013)
Zip Education	0.00028	0.00102	-0.00177^{**}	-0.00026^{*}
			(0.00076)	(0.00013)
Zip Marital Status	0.00023	0.00120	-0.00170^{**}	-0.00032^{**}
			(0.00076)	(0.00014)
Zip 1996 Voting / Contribs.	0.00003	0.00359	-0.00174^{**}	-0.00032^{**}
			(0.00073)	(0.00014)
County Religion	0.00007	0.00009	-0.00188^{**}	-0.00024^{*}
			(0.00074)	(0.00013)
(No Demographics)	0.02609	0.10770	-0.00163^{*}	-0.00018
			(0.00090)	(0.00025)
(Complete set)	0.00000	0.00000	-0.00178^{**}	-0.00025^{*}
			(0.00075)	(0.00013)
Number of Clusters	2379	5582	2379	5582
N	197,551	116,465	197,551	116,465

$^{*}p < .1$; $^{**}p < .05$; $^{***}p < .01$

Cluster-robust standard errors in parentheses (clustered by cable system). The first two columns are the decrease in R^2 resulting from excluding all variables in the listed group from the viewership and the voting regressions, respectively, relative to the version of the model with the complete set of demographic controls included. The third column shows the estimated first stage coefficient on FNC position when the corresponding group of demographic variables is excluded from the equation. The final column is the same exercise, for the reduced form equation. All regressions include the "Extensive" demographic set, with the exception of the indicated group of variables, plus state-year fixed effects.

ing Republican and watching Fox News. For example, consider the zip code fraction of campaign contributions going to Republicans in 1996, before the arrival of Fox News. This variable is an extremely strong predictor of Republican voting in both the individual and zip code data, with t-statistics exceeding 8. It is also a significant predictor of zip code level Fox News viewership in 2008. However, including this variable on the right-hand side does not appreciably change the coefficients on FNC position in either the first stage or the reduced form, in both datasets. Thus, in order for selection to drive our results, local cable systems would have to be targeting the Fox News channel position using correlates of 2000-2008 Republican voting that are orthogonal to or negatively correlated with our extensive set of zip code demographic and political covariates. Given that cable operators do not appear to be targeting positions on the basis of obvious predictors of Republican-ness, along with the numerous other constraints that they face in determining channel lineups, we find it implausible that they are engaging in such precise and sophisticated forms of targeting.

We check the predictive power of Fox News positions with one more observable: satellite viewership in the same zip code. To carry out the satellite placebo test in the zip code level data, we create a data set which has two observations for each zip code and year: the mean viewership amongst cable subscribers and the mean viewership amongst satellite subscribers. We then run the first stage regression, but interacting the channel positions on their local cable system with an indicator for whether the observation represents viewership for cable or for satellite. In the individual level data, we can directly identify whether a respondent is a cable subscriber, a satellite subcriber, or neither.[23] We therefore run the first stage individual-level regression restricted to only cable and satellite subscribers, and interact channel positions with an indicator for whether the viewer subscribes to satellite. If the channel positions on the local cable system are chosen in response to unobservable local characteristics, then these positions should also predict satellite subscribers' viewership.

For this test to be informative, it is important that cable and satellite subscribers in the same location have similar unobserved political tastes. While we cannot test this conjecture directly, we can examine how the two groups covary on observable dimensions and news viewing tastes. In Appendix F, we show these correlations. Given

[23]Satellite subscribers make up about 18% of MediaMark respondents, and roughly 16% of MediaMark respondents report subscribing to neither cable nor satellite television service.

that all observable characteristics correlate positively, and that demographics explain little of whether or not an individual is a satellite subscriber,[24] we find it plausible that satellite subscribers' political tastes are correlated with cable subscribers' political tastes as well.

Table 13 presents the results of the satellite placebo test. The Chow test p-value tests for equality between the FNC cable position coefficients. On the individual level data, the satellite times FNC cable position coefficient is positive and significantly different from the negative cable position coefficient. The zip code level data presents a more mixed picture. The satellite times FNC cable position coefficient is negative and significantly different from zero. However, the satellite coefficient is between one-third and one-half the size of and statistically significantly different from the cable times FNC cable position coefficient.

One possible explanation is that, since the zip code level data are for the later years of 2005 to 2008 whereas the individual level data go back to 2000, the satellite effect is conveying persistence in tastes for Fox News from former cable subscribers who subsequently switched to satellite. As satellite market share roughly tripled[25] from 2000 to 2008 - largely at the expense of wired cable subscription - a significant fraction of satellite subscribers in the 2008 sample would have been former cable subscribers. A negative satellite coefficient would be generated if those viewers who were induced to watch Fox News by the cable position when they were cable subscribers developed a taste for the channel that persisted after they switched to satellite. An alternative explanation would be peer effects, leading the cable position effect to spill over into the satellite subscriber pool. Nonetheless, while the individual level placebo is reassuring, the zip level placebo is a potential cause for concern that FNC position is picking up local political tastes, over and above those predictable by demographics, religion, and 1996 county level vote share, even though FNC position does not correlate negatively with the predicted value of voting based on those variables.

As a final test of the instrument's validity, we compare the second stage estimates which use a first stage that is estimated on all respondents (Tables 5 and 6) to an alter-

[24] A regression of an indicator for satellite subscription on the full set of individual plus "extensive" zip-level demographics and state-year fixed effects yields an R-squared for the covariates (once fixed effects are removed) of 0.052. This falls to 0.031 with county-year fixed effects.

[25] According to Nielsen, satellite share was 9.8% in February 2000 and 28.7% in November 2008 (`http://www.tvb.org/research/184839/4729/72512`)

Table 13: First Stage Regressions: Satellite and Cable Subscribers

	FNC Hours per Week					
	(1)	(2)	(3)	(4)	(5)	(6)
Satellite	0.395***	0.442***	0.442***	0.853***	0.835***	0.760***
	(0.042)	(0.041)	(0.051)	(0.092)	(0.091)	(0.099)
FNC Cable Position × cable	−0.004***	−0.005***	−0.005***	−0.003**	−0.003***	−0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
FNC Cable Position × sat	−0.002*	−0.002***	−0.002***	0.0003	0.0004	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
MSNBC Cable Position × cable	0.003***	0.002***	0.002***	0.001	0.001	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
MSNBC Cable Position × sat	−0.00002	−0.0001	0.00001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Data:	Zipcode	Zipcode	Zipcode	Individual	Individual	Individual
Fixed Effects:	State-Year	State-Year	State-Year	State-Year	State-Year	State-Year
Cable Controls (interacted):	Y	Y	Y	Y	Y	Y
Demographics:	None	Basic	Extensive	None	Individual	Extensive
Chow Test p-value	0.015	0.019	0.01	0.049	0.032	0.016
Number of Clusters	5826	5816	4848	2589	2589	2379
N	257,289	256,868	217,687	207,950	207,860	197,551
R^2	0.016	0.025	0.028	0.046	0.065	0.067

*p < .1; **p < .05; ***p < .01

Cluster-robust standard errors in parentheses (clustered by cable system). Columns 1-3 use the zipcode level (Nielsen) data, while 4-6 use the individual level (MediaMark / Simmons) data. Reported N's for the Nielsen data are larger than in the main tables because we treat the satellite viewership and cable viewership in the same zip code as separate observations. observations Instrument is the ordinal position of FNC on the local system. The omitted category for the availability dummies is systems where neither FNC nor MSNBC is available. Cable system controls include the total number of channels on the system and the number of broadcast channels on the system, interacted with a dummy for the individual being a satellite subscriber. See first stage tables for descriptions of the control variable sets.

native version which estimates the first stage on the subset of wired cable subscribers only (presented in Tables 14 and 15). This comparison provides a direct test of the relationship between cable channel position and the error in the voting equation: in Appendix G we show that under the assumption that the exclusion restriction is valid, the ratio between the second stage estimates using these two sets of predicted values converges to the average fraction of cable subscribers in the population. The pooled version (Tables 6 and 5) is the correct estimate; the cable-only first stage version is attenuated towards zero. In contrast, if positions are chosen to be lower in places where viewers are unobservably more Republican, the ratio approaches 1; i.e., the two versions generate similar second-stage coefficients.

Comparison of the two sets of estimates reveals that the ratio between the cable-only first stage version and the comparable specification with a pooled first stage is 0.58, which is slightly *less* than Nielsen's estimate of the national average cable market share in November 2008 of 61.3%.[26] This ratio closely matches the theoretical prediction in the case where the exclusion restriction is satisfied; there is no evident upward bias as would be expected if the exclusion restriction were violated in the expected direction.

Table 14: Second Stage Regressions: Precinct Voting Data

	2008 McCain Vote Share		
	(1)	(2)	(3)
Pred. Cable FNC Hrs.	0.052**	0.052***	0.040**
	(0.009, 0.109)	(0.021, 0.094)	(0.006, 0.079)
Satellite FNC Hrs.			0.001***
			(0.0002, 0.002)
Fixed Effects:	State-Year	State-Year	State-Year
Cable System Controls:	Y	Y	Y
Demographics:	Basic	Extended	Extended
Number of Clusters	6029	4814	3993
N	22,509	17,400	12,417
R^2	0.730	0.833	0.841

*p < .1; **p < .05; ***p < .01

The first stage is estimated using viewership data from only those Nielsen households who are cable subscribers. See first stage tables for description of instruments and control variables. Confidence intervals are generated from 500 independent STID-block-bootstraps of the first and second stage datasets. Reported lower and upper bounds give the central 95 percent interval of the relevant bootstrapped statistic.

[26] http://www.tvb.org/research/184839/4729/72512

Table 15: Second Stage Regressions: NAES / CCES Data

	P(Vote for Republican Presidential Candidate)		
	(1)	(2)	(3)
Pred. FNC Hrs.	0.052	0.096	0.066
	(−0.132, 0.235)	(−0.024, 0.272)	(−0.012, 0.179)
HH Income		0.462	0.405
		(0.400, 0.525)	(0.349, 0.460)
HH Income^2		−0.360	−0.309
		(−0.426, −0.305)	(−0.372, −0.248)
HH Income^3		0.089	0.077
		(0.073, 0.108)	(0.059, 0.096)
Age Quintile 2		0.006	0.007
		(−0.042, 0.036)	(−0.020, 0.029)
Age Quintile 3		−0.013	−0.010
		(−0.095, 0.043)	(−0.063, 0.027)
Age Quintile 4		−0.056	−0.046
		(−0.163, 0.020)	(−0.114, 0.001)
Age Quintile 5		−0.087	−0.057
		(−0.296, 0.060)	(−0.183, 0.033)
White		0.078	0.070
		(0.042, 0.096)	(0.050, 0.085)
Black		−0.369	−0.341
		(−0.415, −0.344)	(−0.371, −0.316)
Hispanic		−0.063	−0.065
		(−0.090, −0.021)	(−0.085, −0.042)
College Degree		−0.071	−0.055
		(−0.087, −0.048)	(−0.066, −0.041)
Man		0.051	0.059
		(0.006, 0.080)	(0.032, 0.079)
Fixed Effects:	State-Year	State-Year	State-Year
Cable Controls:	Y	Y	Y
Demographics:	None	Individual	Extensive
Number of Clusters	6659	6523	5540
N	134,970	122,738	116,009
R^2	0.029	0.112	0.137

The first stage is estimated on the subset of MediaMark/Simmons respondents who subscribe to wired cable television. See first stage tables for description of instruments and control variables. Confidence intervals are generated from 500 independent STID-block-bootstraps of the first and second stage datasets. Reported lower and upper bounds give the central 95 percent interval of the relevant bootstrapped statistic. "Individual" demographics are measured at the level of the individual respondent. "Extensive" demographics include all of the same individual-level measures plus all of the zip-code-level demographics included in the zip-code-level analysis.

5 Model

We now specify a behavioral model of viewership and voting. The purpose of specifying the model is two-fold: first, we can use the model for counterfactual predictions, such as examining the electoral consequences of mergers or exits in the cable news market. Second, the model helps to interpret the meaning of the IV results. Specifically, the heterogeneity in the model draws attention to the role of the IV as measuring local average treatment effects among agents who are heterogeneous in both their ideological malleability and in their viewership responsiveness to channel position. The model also helps correct the IV estimates for selection into cable or satellite, in regions and times when Fox News was not available from the local cable provider. These benefits come at the cost of assumptions on exactly how consumers allocate their time watching cable news, and the functional form by which they change their ideology after watching slanted news.

The model has two stages. In the first stage, the consumer-voters choose a television package, and how much time to spend watching the cable news channels. In the second stage, the consumer-voters vote in the Presidential election. Between the first and second stage, the consumer-voters' ideologies evolve as a function of the ideologies of and time spent watching the news channels.

5.1 Voter Ideology and Presidential Vote Decision

Consumer-voters have a latent unidimensional political ideology which determines their vote choice in presidential elections. We denote the left-right ideology of consumer-voter i in year t by r_{it}.

We specify voters' initial ideologies as a function of their county of residence and demographic attributes. Specifically, we estimate a logit model of vote choice with county dummies as explanatory variables, which matches county level vote shares from 1996. The county-level intercepts from this model then determine the simulated consumers' initial ideologies, along with demographic effects and an iid logit error term:

$$r_{ij0} = \delta_j + \beta_V' d_i + \epsilon_{ij} \tag{5}$$

Where δ_j is the estimated county intercept for county j, consumer i's county of

residence, d_i is a vector of demographic characteristics associated with consumer i, and β_V is a parameter vector to be estimated. From this starting point, the consumer's ideology evolves in response to both random shocks and the influence of the news channels he watches, according to a process described in detail later in this section.

At election time, each voter votes for the party whose candidate's announced position is closest to her own. This behavior is consistent with voting given a utility function over the ideology of the winning candidate that is single-peaked with maximum at r_{it}. As in all such spatial models, only the cutpoint between the candidate positions, and not the absolute values of the positions, determine the voting decision. We can, therefore, describe each presidential election using a single parameter P_t, for $t \in \{2000, 2004, 2008\}$. All voters to the left of the cutpoint (with $r_{it} < P_t$) vote for the Democratic candidate in the election, and those to the right vote for the Republican. We do not model the turnout decision.[27]

5.2 Viewership and Subscription

The viewership time allocation and subscription portion of the model follows Crawford and Yurukoglu (2012). Given access to the news channels C_{jt} in package j in year t, consumer-voter i allocates their time amongst watching those channels and other activities to maximize:

$$v_{ij} = \sum_{c \in C_{jt}} \gamma_{ict} \log(1 + T_{ijc}) \tag{6}$$

where γ_{ict} is consumer-voter i's preference parameter for news channel c in year t, subject to a budget constraint that the total time available to allocate is B hours per week. We choose the normalization that the outside option (doing anything other than watching cable news) has $\gamma_{i0t} = 1$ for all i, t, and parameterize the remaining vector of γ_{ict} as

[27] In Table 45 of the Appendix, we are not able to pin down a precise effect of cable news on turnout.

$$
\begin{aligned}
\gamma_{it} &= \chi_{it} \circ \nu_{it} \\
\chi_{ict} &\sim \mathsf{Bernoulli}(\alpha_{0ct} + \Pi_{0c} d_i + \zeta_0 pos_{ict} - \eta((a + b r_{ct}) - r_{it})^2) \qquad (7) \\
\nu_{ict} &\sim \mathsf{Exp}(\alpha_{ct} + \Pi_c d_i + \zeta pos_{ict}) \qquad (8)
\end{aligned}
$$

χ_{ict} determines whether consumer-voter i has a non-zero preference for channel c.[28] It is a random function of demographics d_i according to parameters Π_0, a channel-year specific fixed effect α_{0ct}, the position of the channel in the lineup according to ζ_0, and the distance of consumer-voter i's one dimensional political ideology r_{it} from the channel's text based estimated ideology r_{ct} according to η. This last term represents taste for like-minded news and follows a similar parameterization to Gentzkow and Shapiro (2010). The parameters a and b scale the text based ideology measures to allow for consumers to perceive slant as a linear function of the text based slant measure. If η is positive, then increasing the ideological distance between consumer-voter i and channel c reduces the probability i watches c.

If the consumer-voter has a non-zero preference for a channel, the intensity of her preference is drawn from an exponential distribution whose rate parameter depends on α_{ct}, a channel-year specific fixed effect, demographics d_i according to parameters Π, and the position of the channel in the lineup according to ζ. The exponential shape assumption mixed with a mass at zero is inspired by the raw hours watched data, which features a mass at zero and right-skewed and monotonically decreasing density.

The constrained maximization problem defined by (6) has an analytic solution described in Appendix H. The indirect utility from solving this problem enters into the consumer-voter's decision of whether to subscribe to cable, satellite, or no television package at all. The conditional indirect utility from subscribing to package j is

$$
u_{ij} = v^*_{ij} + \tilde{\delta}_j + \tilde{\epsilon}_{ij}
$$

where $\tilde{\delta}_j$ is the mean utility of package j, $\tilde{\epsilon}_{ij}$ is an idiosyncratic logit error term and j corresponds to cable or satellite. We also allow consumers to subscribe to no

[28] We use this formulation because most consumers watch zero or one news channel.

package at all. This choice is associated with a normalized $\tilde{\delta}_0 = 0$ and, since we assume consumers cannot watch cable news if they do not subscribe, the only choice is to spend their entire time budget in non-cable-news activity. This yields corresponding $u_{i0} = \log(1 + B) + \tilde{\epsilon}_{i0}$.

5.3 Ideological Influence

After watching cable news, consumer-voter i's one-dimensional political ideology evolves as a function of how much time i spends watching the news channels and the ideology of the news channels.[29] We assume that i is attracted towards the ideologies of the news channels she watches, the more so the more time i spends watching. Specifically

$$r_{it} = \frac{r_{i,t-1} + \rho \sum_c T_{ic,t-1}(a + br_{c,t-1})}{1 + \rho \sum_c T_{ic,t-1}} + \xi_{it} \tag{9}$$

where $r_{i,t-1}$ is i's ideology in the previous year, r_{it} is i's new ideology, and ρ is a parameter to be estimated which controls the magnitude of news channels' influence on viewers' ideology. The ξ_{it}'s are mean-zero, normally distributed random shocks.[30] This formulation implies that in the absence of watching cable news, viewers' ideologies evolve according to a random walk with zero drift.

One interpretation of ρ is as a (per-hour) rate at which viewers receive ideological signals while watching cable news. If voters treat signals from slanted outlets as true draws on the state of the world, and further, if they do not account for the lack of independence between repeated signals from the same source as in the model of DeMarzo et al. (2003),[31] then equation (9) arises as the inverse-variance-weighted average of signals observed by viewer i in period t.[32]

[29]The channel's ideology measure is the same function of the text based slant measure that enters the viewership decision problem.

[30]We calibrate the variance of the ideology shocks to match the yearly rate of party switching found in the American National Election Study's (ANES) 2008-2009 Panel Study. This study tracked and repeatedly interviewed the same group of respondents over the course of a presidential campaign, allowing an estimate of the within-individual propensity to change support from the Republican to the Democratic presidential candidate over time. Specifically, we calibrated the standard deviation to 0.4654. This magnitude implies that, when such a shock is added to standard logistic distribution, the mass which changes sign matches the observed fraction of switchers in ANES.

[31]Gentzkow and Shapiro (2006) explore media consumption and endogenous slant with fully Bayesian consumers.

[32]For this interpretation to hold over a series of periods, we require that at the beginning of each period

The functional form here implies that a consumer-voter's attraction is governed by the same parameter (ρ), whether coming from the left or the right. The parameter doesn't depend on how far away the consumer-voter starts from the channel. It rules out that a voter might watch a slanted channel, become disgusted, and move in the opposite direction of the channel as in Arceneaux et al. (2012). Furthermore, consumer-voters are naive about the influence effect when choosing time watched.

6 Estimation, Results, and Empirical Identification

We estimate the parameters of the model by indirect inference (Smith (1990); Gourieroux et al. (1993)). This implies choosing the estimates of the model's parameters that generate predictions for an auxiliary model to match the auxiliary model estimated from the data. The auxiliary model consists of thirteen linear regressions that fall into four categories, plus a set of unconditional moments: (1) regressions of individual-level and zipcode-level time spent watching each cable news channel on demographics and channel positions, (six regressions), (2) a linear probability model of watching any positive amount of each cable news channel at the individual level on demographics and channel positions (three regressions), (3) regressions of individual level intent to vote Republican and zipcode level Republican vote share on demographics and predicted time spent watching Fox News from (1) (two regressions), and (4) OLS regressions of intent to vote Republican and zipcode level Republican vote share on hours of Fox News, MSNBC, or CNN watched (two regressions).[33] (1) and (3) correspond to the two-stage least squares estimate of the effects of watching Fox News on voting Republican using channel positions as instrumental variables presented in Section 4, with the addition of analogous first-stage regressions for the other two channels. We introduce

the consumer gets an ideology shock which returns the variance of his ideology to 1.

[33]The individual-level OLS regression uses, rather than hours watched, an indicator for whether Fox News, MSNBC, or CNN is an individual's "most-watched" news source as the right-hand-side variable. The reason for this substitution is, as described in Section 3, that we lack an individual-level data set with information on both hours watched and voting preferences. The NAES survey asked respondents only to list which of the news channels, if any, they watched the most. For the model's predictions in this regression, we also use the implied most watched cable news for each simulation.

(2) to identify the Bernoulli and exponential components of our utility specification. (4) corresponds to the OLS regression of intent to vote Republican on viewership presented in Table 7. To match the empirical specifications in Section 4 as closely as possible, all regressions include state-year fixed effects. Finally, we also match (5) the actual vote shares in each presidential election, the year by year hours watched for each channel, and the year by year fraction of non-zero viewership for each channel. We choose the model's parameters so that estimating (1)-(5) on data simulated from the model produce coefficient estimates with minimum distance to those in the data. We weight the distance metric in proportion to the inverse of the variance in the estimated relationships in the real data.

6.1 Empirical Identification

Empirical identification, that is an intuitive description of what in the data drives estimates of the model's parameters, is relatively straightforward. In terms of the notion of parameter estimated sensitivity, formalized in Gentzkow and Shapiro (2013), ρ, the parameter which determines the degree of influence, is sensitive to the coefficients on projected time in the second stage regression. η, the parameter governing the degree of tastes for like-minded news, is sensitive to coefficients on which channel is reported as most watched in the OLS regression relative to the coefficients on projected hours watched in the second stage regressions. One intuition for these estimates comes from considering the OLS regression of intent to vote Republican on Fox News Channel hours watched. The coefficient estimates on hours watched of Fox News Channel would not be a credible measure of the effects of consuming media because the estimate would conflate tastes for like-minded news with any influence effect. However, if one knew the level of the influence effect, then this estimate would be informative about the tastes for like-minded news. Our approach is to measure the influence effect by using channel positions as instrumental variables, and choose the level of tastes for like minded news to explain the OLS coefficient conditional on the influence effect.

ζ, the parameters determining the strength of channel positions in the time allocation problem, are sensitive to the first stage coefficients on channel positions. A similar straightforward relationship applies to the demographic factors influencing time watched and the coefficients on demographics in the first stage regressions.

P_t, the parameters characterizing the three presidential elections in our sample period, are sensitive to the unconditional aggregate vote share moments. These parameters allow the model to capture national trends in party preference. β_V are sensitive to the OLS and second stage IV coefficients on demographics. They allow consumers with different demographics to have different mean preferences over party.

Finally, a and b, the parameters scaling our text-based ideology measures, are sensitive to both the OLS regression coefficients as well as the coefficient on projected hours watched in the second stage regression. Separate identification of these parameters from ρ and η is possible because there are three channels and thus seven moments to work with- the IV coefficient and three from each of the OLS regressions. The asymmetries in the channels' estimated effects relative to their text-based ideological positioning provide variation to distinguish the scaling parameters from ρ and η. To make this concrete, consider the OLS estimates for Fox News and MSNBC. The Fox News coefficient is more positive than the MSNBC coefficient is negative. Increasing η intensifies the magnitude of both OLS coefficients generated from the model in similar proportions. Increasing b at a fixed η increases the magnitude of the Fox News coefficient at a faster rate than the MSNBC coefficient, because the text-based Fox News ideology is more conservative than the text-based MSNBC ideology is liberal.

6.2 Model Estimates

Table 16 shows the main parameter estimates from the model.[34] We estimate positive values for both ρ, the influence parameter, and η, the taste for like-minded news, implying a positive feedback process where voters watch slanted news, are influenced to move closer to the news' channel's ideology, and subsequently have even stronger preference for that channel, due to the decreased ideological distance.

The magnitude of the estimate of the taste for like minded news parameter η implies that an ideological distance of one unit between viewer and channel reduces that viewer's probability of watching by about 2.5%. For reference, at our estimated scaling parameters, the ideological distance between Fox News and MSNBC in 2008 is 4.3 units. Given the quadratic-loss specification of ideological tastes, this distance

[34]The full set of parameters additionally contains channel-year fixed effects and demographic terms, separately for the amount watched and the probability of watching any. These are omitted here for brevity. The estimated model's fit on regression coefficients is available in Appendix I.

Parameter	Estimate	Bootstrapped Standard Error
Slant Preference (η)	0.02450	0.01118
Ideological Influence (ρ)	0.05244	0.01570
Position Effect - Ratings	-0.00020	0.00028
Position Effect - Viewership	-0.00041	0.00142
2000 R/D Threshold	-0.314	0.0343
2004 R/D Threshold	0.059	0.0356
2008 R/D Threshold	0.030	0.0115
Channel Ideology Intercept (a)	0.323	0.0413
Channel Ideology Slope (b)	17.271	0.0241

Table 16: Key parameter estimates.

implies that an average demographic voter located at the ideological position of Fox News in 2008 is about 45% more likely to watch Fox News than she is to watch MSNBC.

The magnitude of ρ implies that a voter watching an hour per week of a news channel for a year would be influenced to a new ideological position just over 5% of the distance to the channel's ideology. Estimates of the channel position parameters, consistent with the data, imply that increasing channel position decreases both the probability of watching any of a channel, as well as the number of hours watched conditional on watching any. The effect on the probability of watching any - row 4 in the table - implies increasing channel position by 20 positions decreases the probability of a typical voter watching a channel by about 1%.

The channel position effect on the number of hours watched is harder to interpret directly, as the hours-watched model is nonlinear and hence effects of changing these quantities depend on the values of all the other covariates. Tables 17 and 18 therefore show some interpretable quantities generated by the model for viewers with various demographic and ideological profiles.

Table 17 shows computed elasticities of viewers' expected minutes watched with respect to channel position. We compute the change in ratings (measured in minutes per week) resulting from a one-standard-deviation decrease in channel position. All are weakly positive, as expected, although some are exactly zero because the average viewer of the given demographic and ideological profile does not watch any of the channel, regardless of position. Viewers' demographics and initial ideologies have an important influence on their sensitivity to channel position, with viewer-types who initially watch

Age	Income ($000s)	Ethnicity	College	Gender	Ideology	Channel position semi-elasticity		
						CNN	FNC	MSNBC
65	25	White	No	Man	Centrist	8.9	5.4	2.2
65	25	White	No	Man	Median Republican	7.9	8.6	2.3
65	25	White	No	Man	Median Democrat	10.3	9.2	3.2
30	85	Black	Yes	Man	Centrist	10.7	16.0	0.0
30	85	Black	Yes	Man	Median Republican	8.8	16.0	0.0
30	85	Black	Yes	Man	Median Democrat	10.8	14.9	0.0
65	85	Hispanic	No	Man	Centrist	9.6	0.0	0.0
65	85	Hispanic	No	Man	Median Republican	8.0	0.0	0.0
65	85	Hispanic	No	Man	Median Democrat	9.4	0.0	8.3
30	25	White	Yes	Woman	Centrist	6.8	0.0	4.6
30	25	White	Yes	Woman	Median Republican	4.0	0.0	0.0
30	25	White	Yes	Woman	Median Democrat	7.6	0.0	4.6
65	25	Black	No	Woman	Centrist	10.2	14.9	10.3
65	25	Black	No	Woman	Median Republican	9.9	14.9	6.9
65	25	Black	No	Woman	Median Democrat	9.4	14.2	10.4
30	85	Hispanic	Yes	Woman	Centrist	5.6	4.8	0.0
30	85	Hispanic	Yes	Woman	Median Republican	4.8	9.6	0.0
30	85	Hispanic	Yes	Woman	Median Democrat	5.1	5.2	16.1

Table 17: The semi-elasticity is the change in mean ratings (in minutes watched per week) following a one-standard-deviation decrease in channel position, for selected demographic and ideological profiles.

more of a channel showing larger absolute changes in minutes.

Table 18 shows a different look at the relationship of viewer preference for channels to demographics and channel position. For the same ideological and demographic profiles as in the previous table, Table 18 lists that type of viewer's average hours watched over each of the three cable channels, on a hypothetical system where all three are available and positioned at their median position in the data in 2008. The last column shows the modal "most-watched" channel among viewers of that type. Demographic effects play a large role in determining the average hours watched, particularly for Fox News and MSNBC. Within demographic profiles, ideology drives differences in preferences: all Republican types watch more Fox News than they do MSNBC, and most Democratic types watch more MSNBC than they do Fox News.

In both our raw data and in the simulations, cable news programs are consumed by agents who do not necessarily share the same ideology as the channel. This result is consistent with the analysis in Gentzkow and Shapiro (2011) who find that much of Fox News Channel's audience is composed of people who do not self-identify as conservative, and related, that self-identified conservatives watch other cable news

						Mean hours watched			Modal
Age	Income ($000s)	Ethnicity	College	Gender	Ideology	CNN	FNC	MSNBC	Fav. Chan.
65	25	White	No	Man	Centrist	2.28	2.72	0.85	CNN
65	25	White	No	Man	Median Republican	2.05	4.06	0.00	FNC
65	25	White	No	Man	Median Democrat	2.39	0.84	1.33	CNN
30	85	Black	Yes	Man	Centrist	2.34	0.08	0.01	CNN
30	85	Black	Yes	Man	Median Republican	2.05	0.08	0.01	CNN
30	85	Black	Yes	Man	Median Democrat	2.43	0.07	0.01	CNN
65	85	Hispanic	No	Man	Centrist	2.19	0.01	0.00	CNN
65	85	Hispanic	No	Man	Median Republican	1.89	0.01	0.00	CNN
65	85	Hispanic	No	Man	Median Democrat	2.28	0.00	0.54	CNN
30	25	White	Yes	Woman	Centrist	1.62	0.00	0.68	CNN
30	25	White	Yes	Woman	Median Republican	1.15	0.00	0.00	CNN
30	25	White	Yes	Woman	Median Democrat	1.72	0.00	1.21	CNN
65	25	Black	No	Woman	Centrist	2.52	2.70	2.86	FNC
65	25	Black	No	Woman	Median Republican	2.23	2.72	2.15	FNC
65	25	Black	No	Woman	Median Democrat	2.66	2.43	3.11	CNN
30	85	Hispanic	Yes	Woman	Centrist	1.44	1.44	0.00	CNN
30	85	Hispanic	Yes	Woman	Median Republican	1.09	2.11	0.00	FNC
30	85	Hispanic	Yes	Woman	Median Democrat	1.54	0.46	0.42	CNN

Table 18: Preference orderings of channels, in terms of average hours per week watched, for selected demographic and ideological profiles. The final column is the channel which is most commonly the most watched for that profile.

besides Fox News.[35] The model estimates match these facts. Furthermore, such a lack of ideological segregation is a necessary precursor in this model for cable news consumption to change voter intentions.

We find that the perception of slant for the channels is a multiple of about 17 times the text based slant measure. The text based slant measures place Fox News and MSNBC in 2008 closer to the center than the median Republican or median Democratic congressman, respectively. The scaled ideology estimates place Fox News to the right of the median Republican voter in 2008. MSNBC's position falls to the left of the median Democratic voter in 2008, although only slightly.

Table 19 shows the change in the probability of voting Republican with respect to watching one hour per week of each of the cable channels, again for viewers with different initial ideological types. For initially centrist voters, watching CNN has an influence on the probability of voting Republican that ranges from slightly positive to slightly negative depending on the election. The effect of MSNBC is small but positive (meaning watching MSNBC increases the likelihood of Republican voting) in

[35]Their results apply more broadly showing that individuals across the political spectrum tend to consume media that is ideologically diverse.

Election	Voter Ideology	1 Hour CNN	1 Hour FNC	1 Hour MSNBC
2000	Centrist	0.019	0.053	0.012
	Median Republican	-0.025	-0.001	-0.031
	Median Democrat	0.053	0.083	0.047
2004	Centrist	-0.013	0.061	0.039
	Median Republican	-0.048	0.009	-0.008
	Median Democrat	0.029	0.090	0.071
2008	Centrist	-0.046	0.126	-0.066
	Median Republican	-0.077	0.053	-0.095
	Median Democrat	0.003	0.152	-0.011

Table 19: Effects of watching an additional 1 hour per week on the probability of voting Republican.

Election	All voters		Only attached voters	
	FNC (D to R)	MSNBC (R to D)	FNC (D to R)	MSNBC (R to D)
2000	57%	16%	53%	12%
2004	25%	0%	3%	0%
2008	25%	8%	7%	1%

Table 20: Persuasion rates of Fox News and MSNBC. "All voters" counts as a Democrat any voter initially to the left of the election cutoff, and counts as a Republican any voter initially to the right. "Only attached voters" includes only voters in the leftmost 33% and rightmost 33% of the voter ideology distribution. Percentages are conditional on watching the channel.

2000 and 2004, but becomes substantially negative (at 6.6 percentage points) in 2008 after MSNBC's format switch. The effect of Fox on centrist viewers is consistently positive, ranging from 5.3 points in 2000 to 12.6 points in 2008.

The largest elasticity magnitudes are on individuals from the opposite ideology of the channel. Were a viewer initially at the ideology of the median Democratic voter in 2008 to watch an hour of Fox per week, her likelihood of voting Republican would increase by just over 15 percentage points. Another pattern that emerges from the table is that Fox is substantially better at influencing Democrats than MSNBC is at influencing Republicans. This last feature is consistent with the regression result that the IV effect of Fox is greater and more consistent than the corresponding effect for MSNBC.

Finally, Table 20 shows an estimate of DellaVigna and Kaplan (2007)'s concept of *persuasion rates*: the success rate of the channels at converting votes from one party to the other.[36] The numerator here is the number of, for example, Fox News viewers who are initially Democrats but by the end of an election cycle change to supporting the Republican party. The denominator is the number of Fox News viewers who are initially Democrats.[37] Again, Fox is consistently more effective at converting viewers than is MSNBC.

7 Polarization and Media Power

In this section, we perform several exercises to quantify the effects of cable news on election outcomes. First, we simulate the evolution of ideology for a group of voters over time to measure the effect of cable news on the aggregate distribution of political ideology in the viewing public. Second, we estimate the effect of the entry of Fox News on the 2000 presidential election, as well as the effects of the post-2004 MSNBC format switch on the 2008 presidential election. Finally, we measure the "media power" (Prat, 2014) of the individual channels as well as a hypothetical combination of the three under unified ownership.

Evolution of viewer ideology A positive ρ, implying that watching slanted news affects ideology, and a positive η, implying a taste for like-minded news, together create the potential for a polarizing feedback loop. Consider forcing an initially centrist voter to watch only the Fox News Channel. The more that individual watches the Fox News Channel, the more they drift to the right; the more they drift to the right, the more they are attracted to watching Fox News, and so on. These two effects reinforce each other, in a positive feedback process related to theoretical models from the literature on network formation (Holme and Newman, 2006). In this section, we quantify the rate at which such polarization can occur, given our model's estimates.

[36] DellaVigna and Kaplan (2007) use a measure of Fox News cable availability in 2000 to generate variation in self-reported viewership. In their case, the viewership measure is an indicator for whether the respondent reports watching thirty minutes or more in a given week. Here, we use a continuous measure, condition on demographics, and account for satellite viewership.

[37] As our model has no inherent notion of partisanship, only an ideological cutpoint between the parties, in Table 20 we consider two definitions of what constitutes a Democratic or Republican partisan.

Figure 6(a) shows the results of a simulation of viewing and voting behavior given the model parameters estimated in the previous section. A sample of 10,000 hypothetical viewers in an average cable system[38] in a county with average demographic characteristics are assigned ideologies from the initial ideology distribution, conditional on their simulated demographics. In each year, they choose whether and how much to watch of each channel, given individual-specific preferences. Their ideologies then adjust towards the ideology of the channels they view in accordance with equation 9. This process repeats over the next ten years.

The resulting distribution of ideologies becomes visibly more polarized as the process continues, with new right and left modes emerging from the initially approximately unimodal distribution by the end of the simulation. In addition to plotting the distribution, we show the value of the axiomatic measure of polarization of Esteban and Ray (1994) and Duclos et al. (2004) in each year.[39] This value increases as time goes on, by a total of about 2.5% by the end of the 10-year period. The locations of the local maxima in the distribution correspond to Fox News' ideological location and an intermediate location between that of MSNBC and CNN.

This increase in polarization is dependent on the existence of a taste for like-minded news; without such a taste, no new poles emerge. Figure 6(b) shows the evolution of the ideology distribution in a simulation that is identical in all respects to that in Figure 6(a) but one: the taste for like-minded news is set to zero. Here, the distribution remains roughly unimodal throughout. One effect visible in the version without a taste for congruent news is that the tails of the distribution thin out, as viewers from across the political spectrum are exposed to and persuaded by news from the other side. Additionally, the distribution shifts on the whole to the right, as Fox News' relatively more extreme location allows it to out-persuade its relatively moderate competition. Normally, this greater potential for influence is counterbalanced by the fact that the more extreme location dissuades many left-leaning viewers from watching. But with

[38]For purposes of this simulation, all viewers are given access to all three cable channels, at the channels' mean positions in the data. We hold channel positioning, channel fixed-effects, and each channel's ideological slant constant at their 2008 values.

[39]There are four axioms which imply this measure. For example, the first axiom is "If a distribution is composed of a single basic density, then a squeeze of that density cannot increase polarization." We refer the reader to the original articles for full definitions and examples. We compute the measure with the parameter α set to 1.

the taste for slant disabled, viewers from across the political spectrum are exposed to Fox.

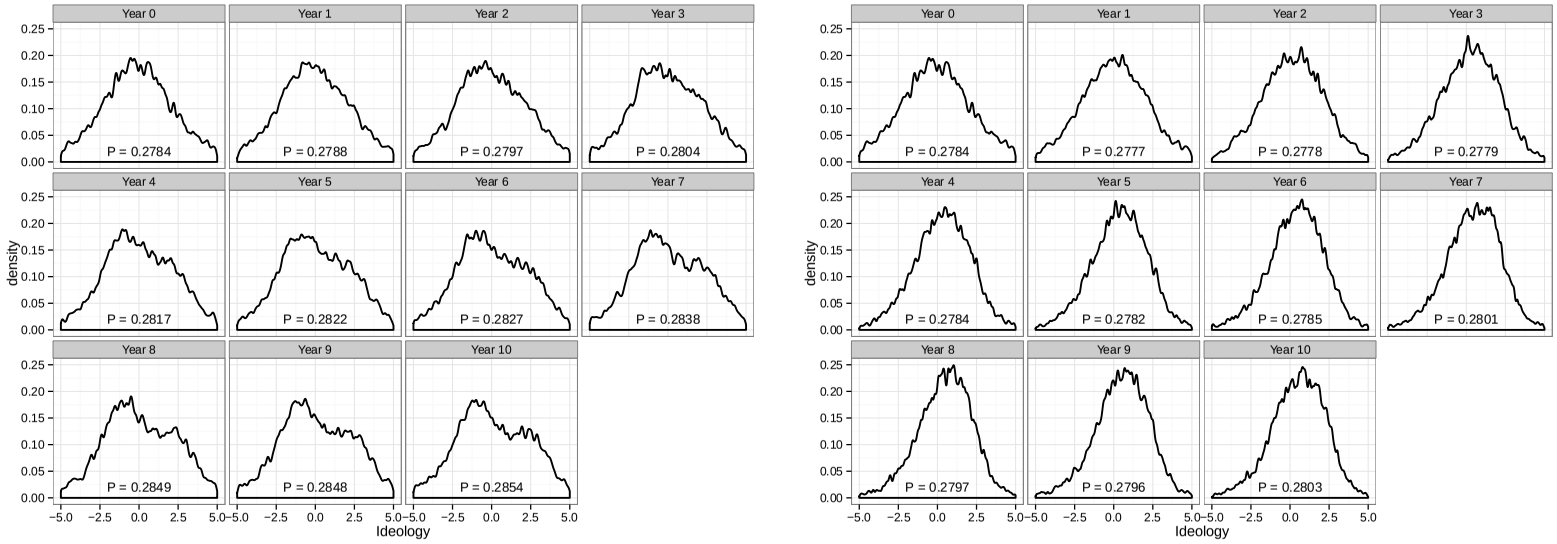
To provide a benchmark with which to compare the relative magnitude of the cable-news-driven increase in polarization, we computed the same Esteban-Ray polarization measure after an extreme "hollowing out" of the ideology distribution.[40] The polarization measure in this case more than doubles to 0.591. We conclude that while cable news is potentially responsible for a modest increase in the ideological polarization of the viewing public, the audiences of the channels are not selected enough to generate the dramatic polarizing force claimed by their detractors.

Fox Entry in 2000, and MSNBC Format Switch Next, we estimated the effect of two counterfactual scenarios aimed at measuring the aggregate influence of the cable news channels on election outcomes. First, we measured the effect of the entry of Fox News into the cable news market beginning in late 1996 on the 2000 presidential election. Using our estimated model parameters, we simulated two conditions. First, a base case where Fox was available to cable subscribers in the 1997-2000 period according to the observed rollout pattern. Second, a scenario where Fox was available exclusively to satellite subscribers and not on any local cable system. We computed aggregate aggregate vote outcomes under each scenario.

	R Vote Share Change	
Election	No Fox News	MSNBC Tracks CNN
2000	-0.0045	0.0006
2004	-0.0330	-0.0125
2008	-0.0546	0.0004

Table 21: Effects of two counter-factual scenarios. In the first, Fox News is eliminated from cable lineups. Column 2 shows the change in the Republican vote share of the presidential popular vote in the no-Fox scenario relative to the baseline. In the second, MSNBC's ideological positioning matches that of CNN throughout the 2000-2008 period. Column 3 shows the change in the Republican vote share of the presidential popular vote in the MSNBC-matching-CNN scenario relative to the baseline.

[40]Specifically, we transformed the initial distribution of ideology by assigning all Democratic simulated voters to the right of the median Democrat the median Democratic ideology, and assigning all Republican simulated voters to the left of the median Republican the median Republican ideology.



(a) $\eta = 0.025$ (b) $\eta = 0$

Figure 6: Voters are initially drawn from the unconditional ideology distribution in 2008. The remaining 10 plots show the change in the ideology distribution over years. The numbers in the center of the plots are the Esteban-Ray polarization measure of the distribution.

The first column of Table 21 shows the effects of eliminating Fox from cable lineups prior to the 2000 election, as well as the effect on subsequent election cycles. The population-weighted average Republican vote share falls by .45 percentage points under the no-Fox scenario relative to the baseline. This prediction is in line with the estimate of 0.26 to 0.36 of DellaVigna and Kaplan (2007), when updated to use more accurate data.

We also repeat this no-Fox counterfactual exercise in the two subsequent election cycles. In subsequent cycles, the implied Fox News effect increases due to two forces. First and most importantly, overall Fox News viewership approximately doubles during the period from 2000 to 2008, meaning nearly twice as many viewers are exposed to Fox News in later cycles. Second, according to our ideological estimates, Fox News moves to the right over this period, increasing its persuasive effect enough to outweigh any loss in viewership due to the ideological drift.

The second column of Table 21 shows a second scenario that estimates the effects of MSNBC's format switch to providing more explicitly liberal coverage in 2005. We simulated a condition where MSNBC's ideology matched that of CNN, and compared to our base case. The results show that the estimated effect in the 2008 election cycle of this switch is to increase the Republican share of presidential vote intention by just 0.04 percentage points, an effect two orders of magnitude smaller than the estimated effect of eliminating Fox News in 2008. This minimal effect derives from two sources. One, MSNBC's viewership is substantially smaller than that of Fox News. Second, MSNBC's estimted ideological position in the 2008 cycle is not all that far to the left of CNN, whereas Fox News is well to the right. For comparison purposes, we also run this scenario for the earlier two election cycles, showing that in the 2004 cycle, MSNBC was a net conservative force.

Media Power Prat's (2014) notion of *media power* refers to the minimal quality candidate for whom a media owner could engineer an election victory through persuasive efforts. While our election model has no quality or "valence" dimension, we can ask a similar question: how many presidential votes could the cable news channels swing from one party to the other, by changing the ideological orientation of their content? Table 22 shows the results of an exercise where we allow each channel to choose its ideological location in each year in order to maximize the ultimate vote share of the

Republican candidate, and then do the same for the Democratic candidate, holding the positions of the other channels fixed. The table shows the difference in Republican aggregate vote share between these two scenarios. In the last column of the table, we show the potential influence of a combined cable news monopolist controlling all three channels and able to set the ideological position of all three to maximize the vote share of a favored party.

	Potential Vote Share Swing			
Election	CNN	FNC	MSNBC	Monopolist
2000	0.0316	0.0125	0.0082	0.0451
2004	0.1243	0.0789	0.0351	0.1969
2008	0.1548	0.1230	0.0471	0.2622

Table 22: The maximum potential vote share swing that the channel could engineer, by election. The "monopolist" column is the is the maximum vote share

Several interesting patterns are evident in the table. First, CNN consistently has the highest power to swing election outcomes, a result of both its relatively large viewership and favorable channel positioning as well as its broad demographic appeal. MSNBC is the weakest of the three, with Fox News falling in between. Second, the potential to change election outcomes are large - the achievable vote share swing of a cable news monopolist exceeds 25% by 2008 - and increasing over time. The time trend is a result of the accumulation of influence over time, as the cumulative reach (the number of voters exposed) of the channels grow with each passing year. The size is a result of the large audiences, particularly for the combined monopoly owner, and the substantially positive estimated influence parameter.

Of course, it is unlikely that cable news channels' sole motivation is maximizing the vote share of one party or the other, as assumed in the preceding "worst-case"scenario. The cable channels are businesses whose revenue derives from advertising and affiliate fees from cable providers,[41] which are likely increasing in audience size but also depend on composition of audience. The profit motive presumably provides some disincentive from choosing extreme ideological locations that would limit their appeal to the mass of ideologically moderate viewers and thereby cost them ratings.

[41] According to SNL, the Fox News Channel received 64% of its revenue from affiliate fees in 2015.

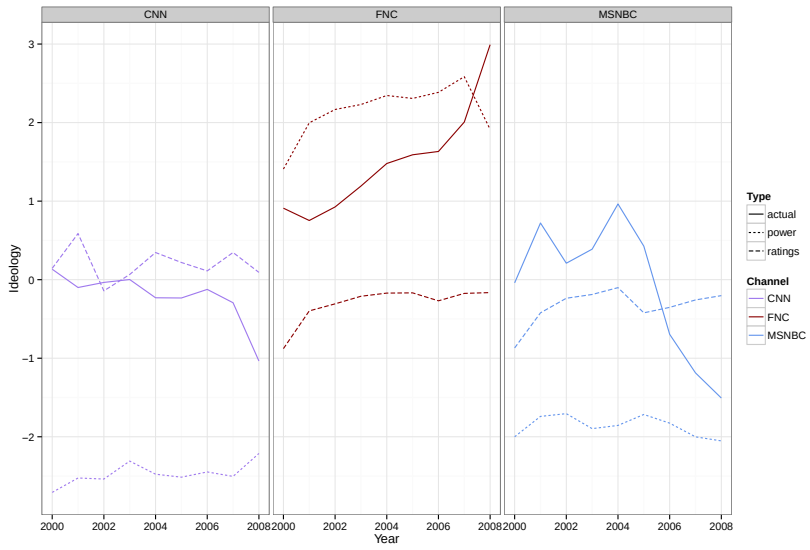


Figure 7: Channels' ideological positioning from 2000-2008. The three lines are the observed position from the text-based measure, the position that would maximize the channel's ratings, and the position that maximizes the vote share for a favored party. For Fox News, we show the position that maximizes Republican vote share; for the other two channels we show the position that maximizes Democratic vote share.

We examined the extent to which this tradeoff constrains the channels' persuasive power, by comparing the power-maximizing ideological position to the ratings-maximizing ideological position. Figure 7 compares each of the three channels' actual, ratings-maximizing, and influence-maximizing[42] ideological positioning in the 2000-2008 period.

Unsurprisingly given the positive taste for slant and the unimodal distribution of viewer ideology, the optimal ideological location from a ratings perspective is quite centrist, and similar for all three of the channels. Comparison of the channel's actual location with the vote-share maximizing choice, however, reveals an asymmetry: the two relatively liberal channels, and CNN in particular, are far from the location that would maximize the vote share of Democratic candidates. Fox News, on the other hand, is close to, and by 2008 actually exceeds, the position that maximizes Republican

[42]For MSNBC and CNN, we plot the choice that maximizes Democratic vote share; for Fox News we plot the choice that maximizes Republican vote share.

vote share. Were Fox to move even further to the right, the loss of liberal viewers turned off by Fox's extreme location would outweigh the gain in persuasive potential among liberal viewers who continued to watch, reducing Fox News' overall influence on election outcomes. Relatedly, the power figures presented in Table 22 do not represent symmetric swings around the actual vote share totals: Fox News is already close to achieving the maximal Republican vote share it can attain on its own, and its power consists almost entirely of the damage it could do to Republican candidates by moving to the left.

Several caveats to this exercise are in order. First, these are partial-equilibrium results. Both the ratings-maximizing and power-maximizing strategies we plot are the best-response functions - holding the locations of the other channels fixed at their actual locations - and not equilibrium strategies, and furthermore not considering entry of new channels. Although an interesting question in its own right, modeling the strategic interaction between channels in this complex dynamic game is beyond the scope of this paper. Second, although ratings are related to profitability, they are not the same thing. Advertising rates vary with the demographics of the audience, and it is possible that a smaller audience is more valuable than a larger one if its composition is skewed in ways - towards higher income households, for example - that are attractive to advertisers. And cable providers' willingness to pay affiliate fees is likely to be higher for differentiated news channels than for homogeneous ones. Hence, though Fox News' strategy appears to cost it some viewers relative to a more centrist positioning, we cannot conclude from this observation that the Fox News ownership must therefore be willing to sacrifice profits for Republican votes.

8 Conclusion

This paper provides estimates of both the influence of slanted news on voting behavior and the taste for like-minded news in the context of cable television news in the U.S. The key ingredient in the analysis is the use of channel positions as instrumental variables to estimate a model of viewership, voting, and ideology evolution. We show instrumental variables estimates that watching the Fox News Channel increases the probability of voting Republican in presidential elections. We probe the instrumental variables assumption by correlating channel positions with observables: demographics

which predict Fox News viewership, demographics which predict partisan vote shares, pre-Fox News partisan vote shares, pre-Fox News partisan donations, and local satellite viewership of Fox News.

We estimate a model of consumer-viewer-voters who choose cable subscriptions, allocate time to watching news channels, and vote in elections. The tastes for news channels are partly determined by the closeness of the news channels' estimated ideology to the individuals. Individual ideology evolves towards the estimated ideologies of the news channels that a consumer watches. We use the estimated model to characterize the degree of polarization that one can attribute to slanted cable news consumption, to measure effects of cable news on elections, and to assess the positioning strategies of the cable news channels. Our estimates imply large effects of Fox News on presidential elections. Furthermore, we estimate that cable news can increase polarization, and that this increase depends on both a persuasive effect of cable news and the existence of tastes for like-minded news. Finally, we find that an influence-maximizing owner of the cable news channels could have large effects on vote shares, but would have to sacrifice some levels of viewership to maximize influence.

Future research could go in a number of directions. The use of channel positions as instrumental variable could be useful in other studies of how media consumption affects behavior. One could also use channel position variation to study the cable news channels in more detail by examining specific programs, e.g. "The O'Reilly Factor," and specific issues like abortion, gay marriage, or government spending. In a different direction, studying the causes and consequences of the divergence in estimated ideologies seems fruitful.[43] It would also be useful to test, refine, or expand the specific model we employ for belief updating after media consumption. For example, one could allow for a joint distribution of influence parameters and tastes for like-minded news in the population.

[43]This includes improving these text based procedures to allow for sentiment analysis or other partisan indicators.

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A Data Construction

A.1 Nielsen FOCUS Lineups

The Nielsen FOCUS data set were provided in two formats. For the largest 55 DMA's, we were given yearly spreadsheets for each DMA. For the DMA's ranked 56 to 210, we were given a CSV file with all systems and years. We stacked all the 1-55 DMA spreadsheets with the 56-210 CSV file. An observation in the main combined file is a cable system-year-channel. A separate file links cable system-years to zip codes. We dropped any cable system labeled "-ADS" or "APTS". These system correspond to alternative delivery systems for single apartment buildings. We synchronized cable channel names across years and system by manual inspection.

The three main challenges with these data are that some zip codes have more than one cable system which serve it, and some cable systems have multiple "devices" whose lineups sometimes, but not always, differ, and some cable system devices have multiple channels listed in a channel position. To deal with the first issue, we first kept the cable system which reports the highest number of total subscribers (across all zip codes). To break ties, we then considered which cable system had the highest number of county subscribers, the most homes passed, and the highest number of channels, and at random, in that order. 124252 ties are broken by total subscribers, and a total of 222 further ties broken by the other criteria. In the case where a device listed two channels in the same position, we kept the channel if it was a news channel, and at random if no news channel was involved. If a channel showed up in two different positions, we used the minimum channel position.

We first dropped any device labeled "COMMUNITY SPECIFIC" or "UNIQUE SITUATION." These were always in systems which had other devices that were labelled "DIGITAL" or "REGULAR." In cases where two devices did not have any overlapping channel numbers, we combined the two devices into one. For systems with multiple devices, we kept the device with the most number of channels. This is often innocuous as the devices would be nested and have the same channel positions for most of the basic channels. If multiple devices had the same number of channels, we kept the device that was labelled "DIGITAL," if possible. If not, we kept the device labelled "REGULAR." These conditions broke all ties.

We dropped any system which did not report carrying any of the top 60 cable channels by Mediamark viewership after the cleaning. These are likely due to error in the cleaning process and correspond to 587 zip code-years out of 522,139 zip code-years (0.11%).

The number of channels variable corresponds to the total number of non-empty channel positions in the cleaned cable lineup. We dropped any pay-per-view channels, channels labeled "BLACKOUT," program guide channels, split-channels (e.g. "Nick at Nite" which is the evening version of Nickelodeon), and HD channels. The number of broadcast channels variable corresponds to the total number of channels that have an associated over-the-air channel number.

A.2 Nielsen Viewership Data

We use zip code-level viewership data from Nielsen Local Television View (NLTV) for the years 2005 through 2008.

Sample selection We downloaded reports from the NLTV interface for zip code level ratings aggregated for each year separately in any zip code where the estimated sample size in the report interface was positive. We used the 5am-5am daypart, and all persons 18 and over. Each zip code year had 9 observations: three for each of CNN, Fox News Channel, and MSNBC. Within each channel, we had a rating for all television households, a rating for households who subscribed to cable television, and a rating for households who subcribed to Alternative Delivery Systems (ADS) which are defined as "Satellite (C-band), DBS (KU-band), SMATV (master antenna), MDS (includes multi-channel, multi-point and multi-point distribution service) and Broadband Only." (http://en-us.nielsen.com/sitelets/cls/documents/nltv/NLTV-CharacteristicDefinitions-Diary.pdf). DirecTV and Dish Network are DBS providers.

Matching to lineup and availability data We match this data set to the Nielsen FOCUS lineups by the zip code and year.

A.3 MRI-Simmons Viewership Data

We use individual-level viewership data from two sources: Mediamark Research's Survey of the American Consumer and Experian Simmons' National Consumer Study. We use Mediamark data from 2000 to 2007, and Experian Simmons data for 2008. In this section, we detail the steps we took in cleaning and combining these data sets.

Sample selection We included in our sample any respondent who responded to all relevant demographic characteristics: race, income, education, age, and gender. We also required the respondent to have a valid zip code.

Demographics We make some simplifications to the demographic questions, as follows. First, racial categories are simplified to three dummy variables, for white, black, and hispanic respectively. The excluded category is all other racial categories. Education variables are reduced to a single dummy variable for having completed at least a bachelor's degree.

Household income comes in binned indicator form in the raw data. For example, there is an indicator for household income of "$15,000 to less than $25,000." We convert these indicators to a continuous variable by computing the expected value of a log-normally-distributed random variable, conditional on the variable falling within the bin boundaries.[44] The parameters of this distribution are calibrated to match the shares of the national population falling into each of the income bins collected by the US Census Bureau. All respondents in the same income bin are, therefore, assigned the same level of income.

Viewership of Cable Channels Both surveys ask about the number of hours viewed in a given week for a variety of television channels. This study uses responses to CNN, the Fox News Channel, and MSNBC. Mediamark asks whether the respondent watched any amount, as well as a multiple choice question for each channel with the following options: 1 hour, 2 hours, 3 hours, 4 hours, 5 hours, 6-9 hours, 10 hours, 11-15 hours, 16-20 hours, and 21+ hours. Experian Simmons also asks whether the respondent watched any amount, and a multiple choice question for each channel with

[44] For the top-coded categories, we compute the expected value conditional on being above the top-coding threshold.

the following options: Less than 1 hour, 1 hour to less than 3, 3 hours to less than 5, 5 hours to less than 7, 7 hours to less than 10, and 10 hours or more. We assigned the midpoint of each interval as the hours watched for that respondent when possible.[45]

Cable or Satellite Subscription We also use whether the respondent subscribes to Cable, DirecTV, Dish Network, or none of the above. For the 5,386 respondents (2.5%) who indicate that they subscribe to both cable and one of the satellite providers, we assume they only subscribe to the satellite provider.

Matching to lineup and availability data We match both data sets to the Nielsen FOCUS lineups by the respondent's zip code and year.

A.4 Construction of 2008 zip-level vote

Precinct-level voting data for the 2008 presidential election come from the Harvard Election Data Archive (HEDA, Ansolabehere and Rodden, 2011). We matched each precinct to a ZIP code (the level at which our cable position data is defined) using a spatial matching procedure. For each precinct in the HEDA shapefile, we computed the coordinates of the precinct's centroid. We then overlaid the precinct centroids onto the polygon files defining zip code tabulation area boundaries provided by the US Census Bureau's TIGER/Line series, generating a corresponding ZIP code for each precinct.

There are a minority of cases for which the precinct centroid does not fall within the boundaries of any ZIP code. This can happen, for instance, if the precinct centroid falls in a lake or other body of water, which are excluded from the ZIP polygon boundaries. In these cases, we match to ZIPs by computing the centroids for each ZIP, and finding the nearest neighbor ZIP centroid (by geographic distance) for each precinct centroid.

Once a ZIP code match for every precinct has been constructed in this fashion, we aggregate voting totals across precincts up to the ZIP level. This ZIP level dataset is then used in our reduced-form regression of 2008 Republican presidential vote share on position.

[45]For the highest bin, we used 25 hours for Mediamark and 12.84 hours for Simmons.

A.5 Construction of CCES and NAES datasets

For the 2000, 2004 and 2008 election cycles, we use individual-level political preference data from the National Annenberg Election Survey (NAES). The NAES is a nationally representative telephone survey, conducted as a rolling cross-section between the December of the preceding year and the January following the election year. Survey waves were timed roughly to correspond with major campaign events such as the televised debates. Those interviewed after the election date were asked for whom they actually had cast a ballot; those interviewed before were asked for whom they intended to cast a ballot. The bulk of the interviews occur in the three months prior to the election; 10-15% occur after the election.

Sample selection We included in our sample any respondent in the rolling cross-section who indicated a preference for one of the two major-party presidential candidates, either in the form of intention to vote or of actual vote, pooling together all survey waves. NAES also asked pre-election voters to state how certain they were of their choice, on a scale ranging from "Definitely will vote for candidate" to "Good chance will change mind." We pool all of these responses together as votes for the stated candidate. Voters who did not answer the presidential preference question, or said they "Don't know" or are "Uncertain" of their choice are excluded from the sample.

Demographics We make some simplifications to the demographic questions in NAES, as follows. First, racial categories are simplified to three dummy variables, for white, black, and hispanic respectively. The excluded category is all other racial categories. Education variables are reduced to a single dummy variable for having completed at least a bachelor's degree, which includes the NAES' "Four-year college degree" and "Graduate or professional degree" categories.

Household income comes in binned indicator form in the raw NAES data. For example, there is an indicator for household income of "$15,000 to less than $25,000." We convert these indicators to a continuous variable by computing the expected value of a lognormally-distributed random variable, conditional on the variable falling within the bin boundaries.[46] The parameters of this distribution are calibrated to match the

[46]For the top-coded categories, we compute the expected value conditional on being above the top-coding

shares of the national population falling into each of the income bins collected by the US Census Bureau. All respondents in the same income bin are, therefore, assigned the same level of income.

Most-watched cable channel The 2004 and 2008 editions of the NAES ask respondents to state the TV news source which they watch most. In 2004 this question is phrased in terms of channels (i.e. respondents can select CNN, MSNBC, FNC, or one of the networks) whereas in 2008 it is phrased in terms of programs (i.e, respondents can select *The O'Reilly Factor*, *Anderson Cooper 360*, and so forth.) We convert the 2008 response to channel level by aggregating across all responses that indicate a show affiliated with a particular channel, as well as responses that state the channel name but not a specific program. We then create three mutually exclusive dummy variables for selecting each of the three channels. It is possible (and, in fact, likely) that a respondent may have a 0 for all three of these variables, indicating either that the respondent does not consume any TV news or that she prefers a non-cable source.

Matching to lineup and availability data NAES data is matched to the Nielsen FOCUS lineups by the respondent's zip code and year. Because Nielsen's lineups data are released at the end of December each year, we apply the following rule for temporal matching: any respondent interviewed in the first six months of a year is matched to his zip code's lineup from the previous December 31. Any respondent interviewed in the last six months is matched to his zip code's lineup from the following December 31.

CCES For 2008, we supplement the NAES data with additional respondents from the Cooperative Congressional Election Study (CCES), an online cross-section survey which began operation in 2006. Our construction of the CCES data exactly parallels the discussion of NAES data above. The only differences are that the CCES does not include the most-watched news source question, and that the income bins differ from those used by NAES. The conversion of income to a continuous variable discussed above allows the CCES data to be appended cleanly to the NAES sample.

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threshold.

B Summary Statistics for Voting and Viewership Datasets

Tables 23 through 26 present summary statistics for the primary datasets employed in the 2SLS analysis and behavioral model: voting and viewership data, at the zip code and individual levels.

Table 23: Summary Statistics for 2008 Zip Code Level Voting

Statistic	N	Mean	St.Dev.	Min	Max
Year	22984	2008	0	2008	2008
Republican Two Party Vote Share	22984	0.52	0.17	0.003	0.94
Has FNC	22584	0.94	0.24	0	1
Has MSNBC	22584	0.85	0.36	0	1
FNC Position	22584	39.08	16.93	0	140
CNN Position	22584	30.28	13.69	0	123
MSNBC Position	22584	38.99	24.57	0	164
Number Channels	22584	161.58	51.48	8	249
Number Broadcast Channels	22584	13.55	8.40	2	45
Nielsen Diary Market	22984	0.48	0.50	0	1
FNC Hours	17742	0.82	1.62	0	70.56
CNN Hours	17374	0.53	1.04	0	34.10
MSNBC Hours	17374	0.27	0.77	0	27.89
FNC Hours (Cable)	15616	0.98	2.30	0	70.56
CNN Hours (Cable)	15277	0.70	1.73	0	58.13
MSNBC Hours (Cable)	15277	0.37	1.21	0	54.60
FNC Hours (Satellite)	14947	0.93	2.39	0	69.38
CNN Hours (Satellite)	14598	0.57	1.61	0	68.04
MSNBC Hours (Satellite)	14598	0.23	1.00	0	28.39
Population	22984	12828.07	14841.96	0	113916
Pct Black	22979	0.09	0.16	0	0.98
Pct Asian	22979	0.02	0.05	0	0.72
Pct Other	22979	0.07	0.09	0	1
Pct Hispanic	22979	0.09	0.15	0	1
Pct Male	22979	0.50	0.03	0.10	1
Pct Age 10-20	22979	0.15	0.04	0	0.88
Pct Age 20-30	22979	0.12	0.06	0	0.89
Pct Age 30-40	22979	0.12	0.03	0	0.42
Pct Age 40-50	22979	0.14	0.02	0	0.33
Pct Age 50-60	22979	0.15	0.03	0	0.50
Pct Age 60-70	22979	0.11	0.03	0	0.50
Pct Age 70-80	22979	0.06	0.03	0	0.34
Pct Age 80+	22979	0.04	0.02	0	0.61
Median HH Income	22909	53204.33	22090.18	2499	250001
Pct HS Graduate	22964	0.34	0.11	0	1
Pct Some College	22964	0.29	0.07	0	1
Pct Bachelors Degree	22964	0.15	0.09	0	1
Pct Post Graduate Degree	22964	0.08	0.08	0	1
Pct Own Home	22953	0.73	0.16	0	1
Median Home Value	22815	187870.00	155380.40	9999	1000001
Aggregate Tax Rate	22590	0.01	0.01	0.0001	0.04
Median Number of Rooms	22911	5.70	0.80	1.30	9
Pct Homes Built After 2005	22937	0.03	0.05	0.001	1
Pct Food Stamps	22931	0.11	0.08	0	1
Median Social Security Income	22843	16085.78	2479.94	275	46761
Pct Veteran	22931	0.69	0.11	0	1
Pct Married	22971	0.55	0.11	0	1
Pct Same Sex HH	22953	0.004	0.004	0	0.12
Pct Unmarried HH	22953	0.06	0.02	0	0.50
Pct Family HH	22966	0.11	0.05	0	1
Fraction of 1996 Contributions to Republican	17944	0.70	0.30	0	1
Pct Evangelical (County)	22979	169.76	146.91	0	1113.76
Pct Catholic (County)	22979	189.47	154.32	0	946.82
Pct Jewish (County)	22979	11.81	26.76	0	313.86
Pct Mormon (County)	22979	13.66	65.55	0	915.70
Pct Southern Baptist Convention (County)	22979	84.30	126.84	0	961.39
Pct Suburban	22955	0.10	0.24	0	1
Pct Urban	22955	0.38	0.46	0	1
1996 County Republican Vote Share	22924	0.47	0.11	0.11	0.88

An observation is a zip code in 2008. Demographic data comes from the US Census Bureau. Religious adherence data is from 2010 U.S. Religion Census: Religious Congregations and Membership Study (RCMS).

Table 24: Summary Statistics for NAES/CCES Voting Survey

Statistic	N	Mean	St. Dev.	Min	Max
Year	135574	2003.79	3.20	2000	2008
Has FNC	135574	0.88	0.32	0	1
Has MSNBC	135574	0.87	0.34	0	1
FNC Position	135574	37.84	18.99	0	125
CNN Position	135574	29.75	12.95	0	123
MSNBC Position	135574	39.54	21.61	0	164
Number Channels	135574	141.02	51.55	1	249
Number Broadcast Channels	135574	14.03	7.48	2	45
Intent to vote Republican	135574	0.50	0.50	0	1
Age	134608	48.21	16.42	18	99
White	135574	0.84	0.37	0	1
Black	135574	0.08	0.27	0	1
Hispanic	135574	0.07	0.25	0	1
Bachelors	135574	0.36	0.48	0	1
HH Income	123679	0.66	0.52	0.07	2.17
Male	135574	0.45	0.50	0	1
Most Watched FNC	48695	0.30	0.46	0	1
Most Watched CNN	48695	0.38	0.49	0	1
Most Watched MSNBC	48695	0.10	0.30	0	1
Population	135386	28864.83	18292.89	1	113916
Pct Black	135386	0.11	0.17	0.00	1.00
Pct Asian	135386	0.04	0.06	0.00	0.72
Pct Other	135386	0.09	0.09	0.00	0.98
Pct Hispanic	135386	0.13	0.17	0.00	0.99
Pct Male	135386	0.49	0.02	0.28	1.00
Pct Age 10-20	135386	0.14	0.03	0.00	0.95
Pct Age 20-30	135386	0.14	0.06	0.00	0.93
Pct Age 30-40	135386	0.13	0.03	0.00	0.35
Pct Age 40-50	135386	0.14	0.02	0.00	0.30
Pct Age 50-60	135386	0.14	0.02	0.00	0.29
Pct Age 60-70	135386	0.10	0.03	0.00	1.00
Pct Age 70-80	135386	0.06	0.02	0.00	0.34
Pct Age 80+	135386	0.04	0.02	0.00	0.33
Median HH Income	135359	56307.44	21572.15	2499	240441
Pct HS Graduate	135382	0.29	0.10	0.00	1.00
Pct Some College	135382	0.29	0.06	0.00	1.00
Pct Bachelors Degree	135382	0.18	0.09	0.00	1.00
Pct Post Graduate Degree	135382	0.11	0.08	0.00	1.00
Pct Own Home	135377	0.67	0.16	0.00	1.00
Median Home Value	135273	230027.60	166599.70	9999	1000001
Aggregate Tax Rate	135159	0.01	0.01	0.0001	0.04
Median Number of Rooms	135357	5.60	0.82	1.40	9.00
Pct Homes Built After 2005	135363	0.01	0.01	0.001	0.88
Pct Food Stamps	135363	0.11	0.07	0.00	0.72
Median Social Security Income	135324	16279.69	2071.40	610	31735
Pct Veteran	135363	0.66	0.11	0.00	1.00
Pct Married	135383	0.52	0.10	0.00	1.00
Pct Same Sex HH	135377	0.005	0.004	0.00	0.12
Pct Unmarried HH	135377	0.07	0.02	0.00	0.20
Pct Family HH	135383	0.10	0.04	0.00	1.00
Fraction of 1996 Contributions to Republican	128791	0.69	0.23	0.00	1.00
Pct Evangelical (County)	135341	147.62	127.82	0.00	1113.76
Pct Catholic (County)	135341	207.80	148.39	0.00	946.82
Pct Jewish (County)	135341	18.76	32.10	0.00	313.86
Pct Mormon (County)	135341	15.56	66.89	0.00	915.70
Pct Southern Baptist Convention (County)	135341	72.79	108.71	0.00	961.39
Pct Suburban	135377	0.11	0.25	0.00	1.00
Pct Urban	135377	0.68	0.43	0.00	1.00
1996 County Republican Vote Share	135001	0.46	0.11	0.11	0.88

An observation is an individual. Zip Code demographic data comes from the US Census Bureau. Religious adherence data is from 2010 U.S. Religion Census: Religious Congregations and Membership Study (RCMS).

Table 25: Summary Statistics for Nielsen Viewership Sample

Statistic	N	Mean	St. Dev.	Min	Max
Year	73757	2006.51	1.12	2005	2008
Has FNC	73757	0.94	0.23	0	1
Has MSNBC	73757	0.86	0.35	0	1
FNC Position	73757	39.79	16.74	0	140
CNN Position	73757	29.92	13.25	0	123
MSNBC Position	73757	38.69	21.67	0	164
Number Channels	73757	157.09	46.82	7	249
Number Broadcast Channels	73757	12.65	7.85	2	45
Nielsen Sample Size	73520	55.26	73.08	0.00	1028.00
Nielsen Cable Sample Size	73509	33.55	53.20	0.00	948.00
Nielsen Satellite Sample Size	73516	14.82	18.99	0.00	371.00
Nielsen Diary Market	73757	0.50	0.50	0	1
FNC Hours	73488	0.70	1.39	0.00	70.56
CNN Hours	72059	0.39	0.84	0.00	39.82
MSNBC Hours	72059	0.16	0.57	0.00	34.61
FNC Hours (Cable)	65007	0.85	2.07	0.00	123.14
CNN Hours (Cable)	63715	0.54	1.43	0.00	68.71
MSNBC Hours (Cable)	63715	0.22	0.82	0.00	54.60
FNC Hours (Satellite)	62327	0.81	2.23	0.00	132.55
CNN Hours (Satellite)	60985	0.40	1.21	0.00	68.04
MSNBC Hours (Satellite)	60985	0.14	0.73	0.00	53.09
Population	73603	15247.21	15494.12	6	113916
Pct Black	73603	0.10	0.17	0.00	0.98
Pct Asian	73603	0.03	0.06	0.00	0.72
Pct Other	73603	0.07	0.09	0.00	0.98
Pct Hispanic	73603	0.10	0.16	0.00	0.99
Pct Male	73603	0.50	0.03	0.34	0.84
Pct Age 10-20	73603	0.15	0.03	0.00	0.60
Pct Age 20-30	73603	0.12	0.05	0.00	0.66
Pct Age 30-40	73603	0.12	0.03	0.004	0.30
Pct Age 40-50	73603	0.14	0.02	0.00	0.29
Pct Age 50-60	73603	0.15	0.03	0.001	0.32
Pct Age 60-70	73603	0.11	0.03	0.00	0.50
Pct Age 70-80	73603	0.06	0.02	0.00	0.34
Pct Age 80+	73603	0.04	0.02	0.00	0.31
Median HH Income	73586	53039.73	21138.89	2499	240833
Pct HS Graduate	73600	0.33	0.10	0.00	1.00
Pct Some College	73600	0.29	0.07	0.00	1.00
Pct Bachelors Degree	73600	0.15	0.09	0.00	0.61
Pct Post Graduate Degree	73600	0.09	0.07	0.00	0.92
Pct Own Home	73599	0.72	0.15	0.003	1.00
Median Home Value	73440	189893.60	149240.90	9999	1000001
Aggregate Tax Rate	73137	0.01	0.01	0.0001	0.04
Median Number of Rooms	73589	5.67	0.78	1.50	9.00
Pct Homes Built After 2005	73596	0.02	0.03	0.001	0.63
Pct Food Stamps	73596	0.11	0.08	0.00	0.78
Median Social Security Income	73498	16074.23	2284.50	610	30336
Pct Veteran	73596	0.68	0.10	0.00	1.00
Pct Married	73600	0.55	0.10	0.00	1.00
Pct Same Sex HH	73599	0.004	0.003	0.00	0.11
Pct Unmarried HH	73599	0.06	0.02	0.00	0.20
Pct Family HH	73600	0.11	0.04	0.00	0.57
Fraction of 1996 Contributions to Republican	61764	0.70	0.28	0.00	1.00
Pct Evangelical (County)	73593	168.99	144.62	0.00	1113.76
Pct Catholic (County)	73593	188.09	151.41	0.00	946.82
Pct Jewish (County)	73593	12.02	25.99	0.00	313.86
Pct Mormon (County)	73593	13.16	59.94	0.00	915.70
Pct Southern Baptist Convention (County)	73593	84.94	125.96	0.00	961.39
Pct Suburban	73599	0.11	0.25	0.00	1.00
Pct Urban	73599	0.43	0.47	0.00	1.00
1996 County Republican Vote Share	73441	0.47	0.11	0.11	0.85

An observation is a zip code-year. Demographic data comes from the US Census Bureau. Religious adherence data is from 2010 U.S. Religion Census: Religious Congregations and Membership Study (RCMS).

Table 26: Summary Statistics for Mediamark/Simmons Viewership Survey

Statistic	N	Mean	St. Dev.	Min	Max
Year	207950	2003.72	2.47	2000	2008
Has FNC	207950	0.94	0.24	0	1
Has MSNBC	207950	0.93	0.25	0	1
FNC Position	207950	40.79	17.29	0	140
CNN Position	207950	31.34	13.32	0	109
MSNBC Position	207950	42.48	18.56	0	164
Number Channels	207950	153.14	42.38	14	249
Number Broadcast Channels	207950	16.61	7.32	2	45
Age	207950	46.31	15.75	21	70
White	207950	0.81	0.39	0	1
Black	207950	0.10	0.31	0	1
Hispanic	207950	0.11	0.31	0	1
Bachelors	207950	0.32	0.47	0	1
HH Income	207860	0.74	0.63	0.04	6.33
Male	207950	0.51	0.50	0	1
FNC Hours	207950	1.03	2.70	0.00	25.00
CNN Hours	207950	1.19	2.72	0.00	25.00
MSNBC Hours	207950	0.51	1.63	0.00	25.00
Cable Subscriber	207950	0.65	0.48	0	1
Satellite Subscriber	207950	0.18	0.38	0	1
Population	207630	31101.55	18279.02	0	113916
Pct Black	207628	0.12	0.18	0.00	1.00
Pct Asian	207628	0.06	0.08	0.00	0.72
Pct Other	207628	0.09	0.09	0.00	1.00
Pct Hispanic	207628	0.15	0.18	0.00	0.98
Pct Male	207628	0.49	0.02	0.37	1.00
Pct Age 10-20	207628	0.15	0.03	0.00	0.47
Pct Age 20-30	207628	0.13	0.05	0.00	0.66
Pct Age 30-40	207628	0.13	0.03	0.00	0.35
Pct Age 40-50	207628	0.15	0.02	0.00	0.24
Pct Age 50-60	207628	0.14	0.02	0.00	0.26
Pct Age 60-70	207628	0.10	0.03	0.001	1.00
Pct Age 70-80	207628	0.05	0.02	0.00	0.34
Pct Age 80+	207628	0.04	0.02	0.00	0.35
Median HH Income	207614	65344.72	25327.25	9100	228726
Pct HS Graduate	207614	0.26	0.10	0.00	0.90
Pct Some College	207614	0.28	0.06	0.00	0.60
Pct Bachelors Degree	207614	0.21	0.09	0.00	0.54
Pct Post Graduate Degree	207614	0.13	0.09	0.00	0.63
Pct Own Home	207627	0.69	0.17	0.00	0.99
Median Home Value	207562	288273.00	193230.30	9999	1000001
Aggregate Tax Rate	207426	0.01	0.01	0.0002	0.03
Median Number of Rooms	207612	5.75	0.97	1.50	9.00
Pct Homes Built After 2005	207620	0.01	0.01	0.001	0.75
Pct Food Stamps	207614	0.09	0.07	0.00	0.78
Median Social Security Income	207552	16695.29	2219.52	7122	37418
Pct Veteran	207614	0.68	0.11	0.00	1.00
Pct Married	207614	0.53	0.10	0.00	0.88
Pct Same Sex HH	207627	0.01	0.004	0.00	0.11
Pct Unmarried HH	207627	0.06	0.02	0.00	0.20
Pct Family HH	207614	0.09	0.04	0.00	0.33
Fraction of 1996 Contributions to Republican	198700	0.68	0.23	0.00	1.00
Pct Evangelical (County)	207571	118.06	108.71	0.00	809.59
Pct Catholic (County)	207571	249.21	146.38	0.00	946.82
Pct Jewish (County)	207571	28.12	37.97	0.00	313.86
Pct Mormon (County)	207571	13.07	57.98	0.00	915.70
Pct Southern Baptist Convention (County)	207571	54.59	90.79	0.00	736.46
Pct Suburban	207627	0.05	0.18	0.00	1.00
Pct Urban	207627	0.82	0.34	0.00	1.00
1996 County Republican Vote Share	206879	0.45	0.12	0.11	0.82

An observation is an individual. Zip Code demographic data comes from the US Census Bureau. Religious adherence data is from 2010 U.S. Religion Census: Religious Congregations and Membership Study (RCMS).

C DellaVigna and Kaplan (2007)

DellaVigna and Kaplan (2007) (henceforth DVK) compare changes in presidential vote shares in towns which had access to the Fox News Channel by the year 2000 compared to towns that did not conditional on a rich set of co-variates. The first-order problem in DVK's data is severe mis-measurement due to non-updated entries. Specifically, 45.6% of control group observations, the towns which the DVK data indicate did not have cable access to the Fox News Channel in the year 2000, actually did have access to Fox News, but were not properly updated in that data source. In fact, about 27.7% of these towns already had cable access to the Fox News Channel in 1998. Here we update their results by re-running their specifications with the Nielsen FOCUS data,[47][48]

In the specification with county-level fixed effects, the coefficient on having access to Fox News drops from 0.00694 to 0.00256. In the specification with district-level fixed effects, the coefficient on having access to Fox News remains roughly the same. However, this specification now performs somewhat worse on the placebo tests that DVK used to argue that the estimate is not driven by selection of towns into having access to the Fox News Channel. The estimated coefficient of cable availability of Fox News in 2000 on the change in Republican vote share from 1992 to 1996 is nearly the same as the estimated coefficient for the change between 1996 and 2000.[49]

C.1 The Data Problem

The data source in DVK is the Warren's Cable and Television Factbook (henceforth Factbook). The Factbook updates only a minority of cable systems every year. The extent of non-updating has been documented by Crawford and Yurukoglu (2012). We reproduce the relevant years from their Appendix table below in Table 27. Updating is especially poor around DVK sample year. Between 1999 and 2000, only 22% of observations were updated. Between 1998 and 1999, only 37% of observations were updated. Since Fox News was expanding across the country rapidly during these years,

[47] These data are discussed in Section 3. We detail in the next subsection why the Factbook data are less suitable for evaluating the effects of Fox News in 2000 than the Nielsen FOCUS data.

[48] We thank the authors for making their code available.

[49] The former is not statistically distinguishable from the latter nor from zero. The placebo estimate (0.0028) is closer to the actual estimate (0.0036) than it is to zero.

this infrequent updating is consequential: many towns in the Factbook were listed as not having cable access to Fox News, when in fact they did but the Factbook simply wasn't updated yet. Nearly all systems in the Nielsen FOCUS data are updated every year.

Table 27: Data Quality of Factbook

Year	*Variable*	*Number of Bundles*	*Fraction of Bundles*
1998	Total bundles	15,743	100.0%
	Full information	10,872	69.0%
	Updated	4,714	30.0%
	Full information and updated	3,461	22.0%
1999	Total bundles	15,497	100.0%
	Full information	10,444	67.0%
	Updated	5,663	37.0%
	Full information and updated	3,595	23.0%
2000	Total bundles	15,453	100.0%
	Full information	10,312	67.0%
	Updated	3,358	22.0%
	Full information and updated	2,478	16.0%
2001	Total bundles	15,391	100.0%
	Full information	9,793	64.0%
	Updated	4,173	27.0%
	Full information and updated	2,663	17.0%
2002	Total bundles	15,287	100.0%
	Full information	7,776	51.0%
	Updated	5,086	33.0%
	Full information and updated	1,484	10.0%
1997-2007	Total bundles	166,619	100.0%
	Full information	91,100	55.0%
	Updated	62,299	37.0%
	Full information and updated	31,493	19.0%

Notes: This table is a reproduction from Crawford and Yurukoglu (2012) indicating the degree of non-updating in Factbook data.

One can verify that the Nielsen FOCUS data are significantly more accurate than the non-updated Factbook data. To audit the two data sources, we consulted a third: cable conversion charts that appeared in weekly TV Week additions of local newspapers. These tables listed channel numbers for local cable systems. Figure C.1 provides an example capture from the microfilms of such a chart. To conduct the audit, we sorted the set of communities where FOCUS and Factbook disagreed on Fox News

availability in 2000 by population size. We tried to find cable conversion charts for the largest two hundred communities. We were able to readily find conversion charts which reference the community name in the system name and provide information on Fox News Channel for 45 communities.[50] For these 45 communities, the FOCUS data were correct on 42 (93.33%) whereas the Factbook was correct on 3. Second, we investigated the systems with a particular large discrepancy: those where Nielsen FOCUS indicated had Fox News availability in 1998 while the Factbook indicated no availability by 2000. 353 of these systems were operated by Tele-Communcations Inc. (TCI) in 1998. Press reports from the time period indicate that Fox News would be available to over 90% of TCI customers by 1998 (Colman (1996)).

Finally, the number of subscribers for Fox News implied by the Factbook data conflict with the amount of viewership Fox News had in 2000, including the viewership data used in DVK. According to DVK, "About half of the Fox News audience, therefore, watches Fox News in ways other than via cable, possibly via satellite. This finding could also be due to measurement error in our measure of availability via cable." According to their data, 17% of households were watching Fox News in 2000. Therefore, 8.5% of all households must have been simultaneously satellite subscribers and watching Fox News. However, the market share of satellite in the year 2000 was 11.4%[51] Therefore, a vast majority of satellite subscribers must have been watching Fox News in 2000 to be consistent with the Factbook availability measures. Our Mediamark data indicate that the fraction of satellite subscribers watching Fox News in 2000 is only 19%.[52]

To correct this issue, we matched the voting and demographic data in DVK to Nielsen FOCUS. The identification numbers in the Factbook and Nielsen FOCUS do not match. We employed a matching procedure based on community names and firm

[50]The exact requirement is that the newspaper explicitly names the community in question. For example, we did not match Greenwich, CT to Cablevision Southern Connecticut as the newspaper did not explicitly mention that Greenwich was covered by this system. Furthermore, some conversion grids did not list all channels. For example, the Boston Globe only provided numbers for 31 basic cable channels, omitting Fox News, even though it had listings for 50 systems. The microfilm scans and spreadsheet with details on the audit are available on request from the authors.

[51]The cable market share was 70.2% implying a 81.6% total market share. Thus, about 14% of cable or satellite subscribers were satellite subscribers.

[52]Their viewership data and our Mediamark data agree on the aggregate 17% number. Our Mediamark data indicate the conditional probability of watching Fox News conditional on satellite is only marginally higher at 19%.

CONVERSION GRID/LOCAL CABLE SYSTEMS/RADIO STATIONS 67

Local systems

Below is a listing of cable systems and communities serviced.

Anoka Ramsey, Champlin, Andover

Apple Valley Farmington, Lakeville, Rosemount

Blaine Centerville, Circle Pines, Coon Rapids, Ham Lake, Lexington, Lino Lakes, Spring Lake Park, Oak Grove

Columbia Heights Hilltop

Lake Minnetonka Deephaven, Long Lake, Minnetrista, Shorewood, Victoria, Excelsior, Medina, Orono, Spring Park, Woodland, Greenwood, Minnetonka Beach, St. Bonifacius, Tonka Bay, Chanhassen, Maple Plain, Mound, Wayzata, Watconia, Loretto

Northwest Brooklyn Park, Brooklyn Center, Robbinsdale, Golden Valley, New Hope, Osseo, Maple Grove, Plymouth, Crystal

Roseville Arden Hills, Falcon Heights, Lauderdale, Mounds View, New Brighton, St. Anthony, Shoreview, Little Canada, North Oaks

Shakopee Chaska

Southwest Eden Prairie, Edina, Hopkins, Minnetonka, Richfield

South Washington County Washington County, St. Paul Park, Cottage Grove, Woodbury, Grey Cloud Island, Newport, Stillwater, Bayport, Oak Park Heights, Afton, Baytown Township, Denmark Township, Lakeland, Lakeland Shores, St. Croix Beach, St. Mary's Point, Stillwater Township, West Lakeland

White Bear Lake Mahtomedi, Willernie, Dellwood, Grant Township, Birchwood Village, Lake Elmo, Vadnais Heights, White Bear Township, Gem Lake, Hugo

Conversion grid

Stations may appear on different channels in each cable system. This chart lists stations and channels in the major local cable systems. • Grid listing.

	Anoka	Apple V.	Blaine	Bloom.	Col. Hgts.	Eag./Burn	Fridley	Hastings	L. Mtka.	Mpls.	Northwest	Roseville	St. L. Park	St. Paul	Shakopee	S. Wash.	Southw.	Wash. Co.	W. Bear
A&E •	58	48	66	26	36	66	28	36	29	29	36	58	28	16	29	36	28	36	58
Amer. Movie (AMC) •	38	48	3	65	40	3	65	40	45	30	40	40	65	30	30	40	65	40	40
Animal Planet (AP) •	27	66	29	29	56	29	29	34		308	34	56	29	67	47	34	29	34	56
BET •	36	65	36	33	66	36	33	54		55	54	66	33	40	60	54	33	54	66
BRAVO (BRV) •	28	43	37	30	21	37	30	66	34	27	42	96	30	48	27	66	30	66	21
C-Span (CSPN) •	71	8	35	21	58	35	21	19	12	23	33	23	21	62	23	19	23	19	23
C-Span II	3	7	39	59	20	39	59	20	6	958	98	25	59	63	45	20	59	20	25
CNBC •	52	36	52	60	33	52	60	29	24	24	29	38	60	28	24	29	60	29	38
Cable News (CNN) •	50	31	50	3	31	50	3	31	46	3	31	36	3	3	3	31	3	31	36
CNN Headline	51	28	51	61	32	51	61	32	30	15	32	37	61	15	15	32	61	32	37
Cartoon Ch. (TOON) •		51		42	55		42	47		248	47	55	42	44	57	47	42	47	55
Cinemax (MAX) •	26	76	26	76	71	26	76	71	22	52	71	71	76	51	52	71	76	71	71
Cinemax2 (MAX2) •		79												54					
Classic Sports (CS) •				51	29		51	64		188	64	34	51	71		64	51	64	34
Comedy Cen (COM) •	42	56	42	31	50	42	31	50	50	31	50	50	31	45	31	50	31	50	50
Court TV (CRT) •	62	50	14		60	14		22		168	55	29	95	57		22		22	29
Discovery (DSC) •	59	47	67	28	37	67	28	37	43	22	37	59	28	22	22	37	28	37	59
Disney (DIS) •	7	27	7	76	53	7	76	44	51	50	44	53	76	58	50	44	76	44	53
E! •	34	54	34	49	51	34	49	51	54	59	51	51	49	43	59	51		51	51
ESPN •	46	29	46	52	25	46	52	25	32	16	25	30	52	7	16	25	52	25	30
ESPN2 •	47	57	47	53	26	47	53	63		268	26	31	53	65	48	63	53	63	31
Eternal Word	74		39	46	38	38	46	21	23	98	56	24	46	61	36	21	46	21	24
Family St. (FAM) •	35	35	27	45	57	27	45	46	16	38	46	57	45	27	38	46	45	46	57
Food Network (FOOD) •					44			33		158	86	44	39			33	39	33	44
Fox News (FNC) •	53		53	63	34	53	63	30		218	30	39	63	69	96	30	63	30	39
FX •	31	58	31		48	31	50	48	30	48	48	48	50	64		48	31	48	48
FX Movies (FXM) •														72					

Figure 8: Cable conversion chart from Minneapolis Star-Tribune in October 2000. The rows correspond to cable channels. The columns correspond to local cable systems. According to the Factbook data used in DVK, Minneapolis did not have access to the Fox News Channel by November 2000. The Nielsen FOCUS data indicate that Minneapolis did have access to Fox News Channel in 1999, and also correctly indicates the channel number of 21B.

names, using manual inspection when matches weren't obvious. We were able to reliably match 8,013 observations out of 9,256 to Nielsen FOCUS. Tables 28 and 29 compare the availability of Fox News according to the two data sources.

		Factbook Fox News (Year 2000)		
		0	1	Total
Nielsen Fox News	0	3,527	51	3,578
(Year 2000)	1	3,076	1,520	4,435
	Total	6,478	1,535	8,013

Table 28: Year 2000: Nielsen Fox News Availability and Factbook non-updated Fox News Availability.

		Factbook Fox News (Year 2000)		
		0	1	Total
Nielsen Fox News	0	4,687	355	5,042
(Year 1998)	1	1,791	1,180	2,971
	Total	6,478	1,535	8,013

Table 29: Nielsen Fox News Availability in 1998 and Factbook non-updated Fox News Availability in 2000.

About 40 percent of the control group in DVK is mis-classified as not having cable access to Fox News. About 25 percent already had access in 1998 and hadn't been updated for at least two years in the Factbook.

C.2 Estimates with Nielsen Data

We now re-run the two "benchmark" specifications from DVK: the county level fixed effects regression and the US House district level fixed effects regression. These correspond to equation (2) in DVK. Table 30 compares the resulting estimates.

The estimate in the county level fixed effects regression drops from a statistically significant at 1% 0.00694 (Column 7) to a significant at 10% 0.00256 (Column 9). The difference cannot be attributed to not matching all of DVK's observations. Their

	Republican two-party vote share change between 2000 and 1996 pres. elections								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Factbook Fox	0.00798***	0.00844***		0.00421***	0.00515***		0.00694***	0.00778***	
	(0.00257)	(0.00271)		(0.00154)	(0.00166)		(0.00150)	(0.00166)	
Nielsen Fox			0.00787***			0.00360***			0.00256*
			(0.00172)			(0.00121)			(0.00141)
Observations	9,256	8,013	8,013	9,256	8,013	8,013	9,256	8,013	8,013
R^2	0.557	0.565	0.567	0.753	0.760	0.760	0.812	0.823	0.822
Data Set	Factbook	Factbook	Nielsen	Factbook	Factbook	Nielsen	Factbook	Factbook	Nielsen
Sample	Full	Matched	Matched	Full	Matched	Matched	Full	Matched	Matched
FE	OLS	OLS	OLS	District	District	District	County	County	County

Robust standard errors in parentheses, clustered by cable firm
*** p<0.01, ** p<0.05, * p<0.1

Table 30: OLS, District FE, and County FE specifications from DVK and with alternative Fox News availability data.

estimated effect is stronger when using their Fox variable, but only on the subset of matching observations (Column 8). The estimate in the Congressional district fixed effects regression remains stable with the Nielsen data.

We now turn to probing the research design of the using Fox News availability in 2000. Table 31 compares the placebo regression estimates using the original data and the Nielsen data. Using the more correct data in the district fixed effect specification, the placebo regression's estimate for the effect of Fox News availability in 2000 on the change in vote shares from 1992 to 1996 is 0.0028, nearly the same as the estimate for the change in 1996 to 2000, compared to -0.00386 using the Factbook data. The coefficient's precision can not rule out a zero effect, but the district fixed effects regression should be interpreted in light of the placebo results. The confidence interval for the Fox News availability in 2000 picking up pre-existing trends has shifted unfavorably from (-0.0085, 0.0038) to (-0.0014, 0.0070). The confidence interval in the county fixed effects placebo regression shifts in the same direction, by a similar magnitude, however the point estimate is nearly zero. Whereas DVK state that "Voting trends are unlikely to be responsible for the Fox News effect," the evidence with the Nielsen data are less supportive of this point.

A similar pattern holds for the district fixed effects specification when examining the correlation of Fox News availability in 2000 with the level of Republican vote share in 1996. The point estimate changes from -0.0343 to 0.150, though in both cases the estimates are noisy with standard errors of 0.095 and 0.124, respectively. The coefficient in the county fixed effects specification becomes slightly more negative, which is reassuring, though again the estimate is noisy. Whereas DVK write "Given the precision of the estimates, we can reject substantial effects of pre-existing political composition on the availability of Fox News, conditional on the control variables," this is not the case when using the Nielsen data with the district fixed effects.

To summarize, using the more correct Nielsen FOCUS data revises down the DVK estimates from a range of 0.4-0.7 to 0.3-0.4. Furthermore, the evidence for the validity of the research design becomes slightly less reassuring using the more correct data. Specifically, the 99% confidence intervals in the placebo regression of the change in Republican vote share from 1992 to 1996 (before Fox News) on Fox News availability in 2000 include the point estimate for the effect of Fox News availability in 2000 on the change in Republican vote share from 1996 to 2000, in both the district and county fixed

effects specifications. The evidence on balance could be interpreted that in studying the effects of Fox News, researchers should utilize the more accurate Nielsen data, and pay special attention to the source of variation identifying the estimates and weigh the costs and benefits of using availability in 2000 or channel positions as sources of variation in viewership of Fox News. Both sources of variation are attractive on different dimensions, but both also display some cause for concern.

	Republican two-party vote share change between 1996 and 1992 pres. elections								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Factbook Fox	0.00539	0.00418		-0.00237	-0.00386		-0.00686**	-0.0111***	
	(0.00503)	(0.00528)		(0.00313)	(0.00335)		(0.00291)	(0.00286)	
Nielsen Fox			0.00807**			0.00280			0.00045
			(0.00327)			(0.00212)			(0.00244)
Observations	4,006	3,527	3,527	4,006	3,527	3,527	4,006	3,527	3,527
R^2	0.327	0.337	0.341	0.620	0.625	0.626	0.732	0.725	0.732
Data Set	Factbook	Factbook	Nielsen	Factbook	Factbook	Nielsen	Factbook	Factbook	Nielsen
Sample	Full	Matched	Matched	Full	Matched	Matched	Full	Matched	Matched
Specification	OLS	OLS	OLS	District FE	District FE	District FE	County FE	County FE	County FE

Robust standard errors in parentheses, clustered by cable firm
*** p<0.01, ** p<0.05, * p<0.1

Table 31: OLS, District FE, and County FE Placebo specifications from DVK and with alternative Fox News availability data.

	Fox News Availability in 2000								
	Factbook	Factbook	Nielsen	Factbook	Factbook	Nielsen	Factbook	Factbook	Nielsen
Pres. republican vote share in 1996	0.390**	0.421***	0.154	-0.0343	-0.0182	0.150	-0.0442	-0.0584	-0.0922
	(0.157)	(0.159)	(0.176)	(0.0949)	(0.0995)	(0.124)	(0.110)	(0.117)	(0.117)
Observations	9,256	8,013	8,013	9,256	8,013	8,013	9,256	8,013	8,013
R^2	0.409	0.403	0.127	0.670	0.668	0.445	0.768	0.771	0.577
Sample	Full	Matched	Matched	Full	Matched	Matched	Full	Matched	Matched
Specification	OLS	OLS	OLS	District FE	District FE	District FE	County FE	County FE	County FE

Robust standard errors in parentheses, clustered by cable firm
*** p<0.01, ** p<0.05, * p<0.1

Table 32: OLS, District FE, and County FE specifications from DVK and with alternative Fox News availability data regressed on 1996 vote share.

D Construction of Channel Ideology Estimates

Our estimates of each channel's political ideology are generated by an adaptation of the method employed in Gentzkow and Shapiro (2010) to measure ideology of print newspapers. The method compares the use frequency of phrases in transcripts of the cable channel's shows to the use frequency of the same phrases in floor speeches by members of Congress recorded in the Congressional Record.

Text sources and transcript selection We downloaded all transcripts from any show appearing on CNN, Fox News, and MSNBC during 2000-2013 that were available in the Lexis-Nexis database. Most of the highest-rated prime-time shows on all of the channels were available in Lexis, with one exception: Glenn Beck's Fox News show, which aired from 2009-2011.[53] We supplemented the Lexis transcripts by downloading transcripts of Glenn Beck's Fox News show from historical versions of the Fox News website archived by the Internet Archive (archive.org). Table 33 lists the shows for which we were able to collect transcripts, by channel. For each show, we downloaded all available transcripts of episodes of that show.

We also downloaded the 1998-2012 Congressional Record (CR) in its entirety from the US Government Publishing Office's website (`http://gpo.gov`). From the raw HTML files we extracted every speech that could be attributed to an individual member of Congress.

Pre-processing of text Both transcript and Congressional record text was pre-processed by removing a list of 184 common "stop words" such as "we," "have," "for," and the like. The list of stop words matches that used by Gentzkow and Shapiro (2010). We then applied the Porter stemming algorithm to reduce variants of words to their common roots.[54] For example, the words "beaches" and "beach" would both be stemmed to "beach." Finally, a script counted the frequency of occurrence of every two word phrase that appears at least five times in total in the Congressional record in

[53] The version of Mr. Beck's show on CNN, which aired from 2006-2008, had transcripts available in the database.

[54] We used an implementation of the Porter stemmer written in the Haskell language by Dmitry Antonyuk and Mark Wotton: `https://hackage.haskell.org/package/porter`

CNN	*Anderson Cooper 360*, *Campbell Brown*, *CNN Live Today*, *CNN News Room*, *CNN Tonight*, *Connie Chung Tonight*, *Crossfire*, *Erin Burnett OutFront*, *Glenn Beck*, *Greenfield at Large*, *John King, USA*, *Larry King Live*, *Moneyline / Lou Dobbs Tonight*, *News Night with Aaron Brown*, *Parker / Spitzer*, *Paula Zahn Now*, *Piers Morgan*, *The Point with Greta van Susteren*, *The Situation Room with Wolf Blitzer*, *Wolf Blitzer Reports*
Fox News	*Fox News Edge*, *Fox News Sunday*, *Glenn Beck*, *Hannity*, *The O'Reilly Factor*, *On the Record with Greta van Susteren*, *Special Report with Bret Baier*, *Special Report with Brit Hume*, *The Edge with Paula Zahn*, *The Kelly File*, *Your World with Neil Cavuto*
MSNBC	*All in with Chris Hayes*, *Ashleigh Banfield on Location*, *Buchanan & Press*, *Countdown with Keith Olbermann*, *Donahue*, *Hardball with Chris Matthews*, *Live with Dan Abrams*, *Morning Joe*, *Politics Nation*, *Rave for the White House 1600 Pennsylvania Ave.*, *Rita Cosby Live and Direct*, *Scarborough Country*, *The Ed Show*, *Last Word with Lawrence O'Donnell*, *The News with Brian Williams*, *The Rachel Maddow Show*, *The Savage Nation*, *Tucker*

Table 33: Cable shows for which transcripts were available, by channel.

that year in the speech of every speaker.[55] A two-word phrase is two stemmed words appearing next to each other (excluding stop words) in the same sentence.

Choice of phrase set There are millions of two-word phrases which result from the phrase-counting algorithm described above. Most of these are of no value for distinguishing the partisanship of a a speaker. As a result, it is necessary to reduce the set of phrases considered to a manageable size, and to limit the number of "noise" phrases. We construct, for each phrase appearing in the Congressional Record, the Gentzkow-Shapiro partisanship statistic. We use the top 1000 "most partisan" phrases in each year according to this criterion, subject to the condition that the phrase must appear at least 20 times in total in the cable news transcripts in that year. We impose this criterion to weed out the (many) purely procedural phrases that appear in the Congressional Record, many of which appear highly partisan because they are spoken primarily by committee chairs, the House Speaker, and other members of the Congressional leadership, who by definition are all members of the majority party in the chamber.[56] The result is a set of 1000 phrases for each year.

Elastic-net regression For each speaker in both the CR and the transcripts, we compute the frequency of each phrase as the count of occurrences divided by the total number of two-word phrases (among all phrases, not just the set of 1000 selected in the previous set). We standardize all frequencies by subtracting the mean frequency (across all speakers) and dividing by the cross-speaker standard deviation of frequency of the phrase in that year. This scaling prevents phrases that are more common overall from being weighted more heavily in the elastic net objective.

The standardized phrase frequencies of the set of 1000 phrases in each year for Congressional speakers are then input to an elastic-net regression (Zou and Hastie, 2005) where the dependent variable is the common-space DW-nominate first dimension score (McCarty et al., 1997) of the legislator. We restrict the sample for this regression to the set of legislators who use the phrases in the set of 1000 at least 100 times in total, which drops a few very infrequent speakers from the sample. We select the lasso

[55] A "speaker" in the TV transcripts is a show; in the Congressional record it is a member of Congress, either a senator or representative.

[56] Some examples of such phrases are "move (the) question," "cloture motion," "unanimous consent," and "absence (of a) quorum."

parameter λ in each year by cross-validation, and set the parameter α to 0.01. Finally, the estimated coefficients from the fitted models are used to compute a predicted ideology for each show-year.

Aggregation to channel-year level We aggregate the show-year-level predicted ideologies to the channel-year level by a simple weighted average: shows in prime time get weight of two, and non-prime-time shows get weight of one. This weighting scheme approximately reflects the cable news audience distribution across the two time slots. Finally, we apply a moving-average smoothing filter to transform the resulting channel-year ideology estimates. This filter has a window of three years; we assign weight of 1/2 to the current year's estimate, and 1/4 each to the previous and next year's estimate.

E Additional Regression Tables

E.1 MSNBC Analysis

This section contains analogous 2SLS results to those in section 4, where MSNBC viewership is treated as the endogenous variable, either instead of or in addition to Fox News viewership. Tables 34 and 35 show the first stage regression of MSNBC hours watched on cable channel positions in the zip code level and individual level datasets, respectively.

Tables 36 and 37 show single-instrument second-stage results with MSNBC viewership instrumented by MSNBC position.

Tables 38 and 39 show dual-instrument second-stage results with both FNC and MSNBC viewership instrumented by FNC and MSNBC positions.

Table 40 presents the analog to Table 13 for MSNBC. Here, the MSNBC cable effect is also strongly negative. The effect on satellite subscribers is around one-tenth the size of the effect on cable subscribers. We also present in Table 41 the analog of Table 10 but probing MSNBC position instead of Fox News position. While most of the coefficients are re-assuring, MSNBC position is significantly positively correlated with the predictable-by-demographics Republican vote share. Taken alone, this would suggest some degree of endogenous positioning of MSNBC, but an alternative explanation tempers this interpretation. The Fox News position displays a coefficient of the same magnitude in Table 10. This suggests an alternative interpretation that both news channel positions tend to be lower overall in less Republican areas, which would bias the Fox News effect in the opposite direction of what we find.

E.2 Separate Specifications Year by Year

In Tables 42, 43, and 44, we run the reduced form and first stage separately by year, as well as a pooled specification where all demographics interact with year dummy variables. There is no zip-level reduced form year-by-year because those data only cover the 2008 election. In the individual level reduced form (Table 42), the Fox News cable position coefficient is negative in every specification, but only significant in the pooled specification and marginally significant in 2004. Fox News position is negative and significant in every specification of the year-by-year zip-level first stage (Table 43).

Table 34: First Stage Regressions: Nielsen Data

	MSNBC Hours Per Week					
	(1)	(2)	(3)	(4)	(5)	(6)
MSNBC Cable Position	−0.002***	−0.002***	−0.001***	−0.001***	−0.001**	−0.001***
	(0.0002)	(0.0003)	(0.0002)	(0.0002)	(0.0004)	(0.0002)
FNC Cable Position	0.001***	0.001***	0.001***	0.001***	0.0003	0.0005***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0002)
System has MSNBC Only	0.144***	0.135***	0.137***	0.173***	0.161***	0.126***
	(0.027)	(0.026)	(0.026)	(0.037)	(0.036)	(0.024)
System has FNC Only	−0.056***	−0.047***	−0.049***	−0.055***	−0.048***	−0.039***
	(0.012)	(0.012)	(0.012)	(0.013)	(0.017)	(0.009)
System has Both	0.085***	0.072***	0.066***	0.069***	0.045*	0.077***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.023)	(0.011)
Sat. MSNBC Hours						0.340***
						(0.032)
Fixed Effects:	Year	State-Year	State-Year	State-Year	County-Year	State-Year
Cable Controls:	Y	Y	Y	Y	Y	Y
Demographics:	None	None	Basic	Extended	Extended	Extended
Robust F-Stat	70.6	35.9	44.1	35	5.3	47.8
Number of Clusters	5670	5670	5660	4720	4720	4632
N	72,059	72,059	71,888	59,994	59,994	50,970
R^2	0.022	0.031	0.041	0.045	0.172	0.386

*p < .1; **p < .05; ***p < .01

Notes: Cluster-robust standard errors in parentheses (clustered by cable system). Instrument is the ordinal position of MSNBC on the local system. The omitted category for the availability dummies is systems where neither FNC nor MSNBC is available. In Column (5), the specification conditions on the average MSNBC ratings among satellite subscribers in the same zip code. Cable system controls include the total number of channels on the system and the number of broadcast channels on the system, as well as an indicator for Nielsen collection mode (diary vs. set-top). "Basic" demographics include the racial, gender, age, income, educational, and urban/rural makeup of the zip code. "Extended" demographics adds information on the percentage of homeowners; median housing values, sizes, ages, and property tax rates; the fraction of the population receiving food stamps; median social security income; the fraction of veterans; the fractions of married, unmarried, and same-sex couples; the share of federal campaign contributions that went to Republican candidates in 1996; the Republican presidential share of the county in 1996; and the religious composition of the county.

Table 35: First Stage Regressions: Mediamark / Simmons Data

	MSNBC Hours					
	(1)	(2)	(3)	(4)	(5)	(6)
MSNBC Cable Position	−0.003***	−0.003***	−0.003***	−0.003***	−0.003***	−0.003***
	(0.0005)	(0.001)	(0.001)	(0.0005)	(0.001)	(0.001)
FNC Cable Position	0.001***	0.001**	0.001***	0.001***	0.001**	0.001**
	(0.001)	(0.0005)	(0.0005)	(0.0005)	(0.001)	(0.001)
HH Income			0.399***	0.379***	0.389***	0.371***
			(0.029)	(0.030)	(0.028)	(0.029)
HH Income^2			−0.147***	−0.143***	−0.144***	−0.140***
			(0.016)	(0.016)	(0.016)	(0.016)
HH Income^3			0.015***	0.014***	0.014***	0.014***
			(0.002)	(0.002)	(0.002)	(0.002)
Age Quintile 2			0.093***	0.098***	0.097***	0.100***
			(0.012)	(0.012)	(0.012)	(0.012)
Age Quintile 3			0.140***	0.148***	0.144***	0.148***
			(0.012)	(0.013)	(0.013)	(0.013)
Age Quintile 4			0.206***	0.215***	0.214***	0.220***
			(0.013)	(0.013)	(0.014)	(0.014)
Age Quintile 5			0.379***	0.384***	0.380***	0.380***
			(0.014)	(0.015)	(0.015)	(0.015)
White			−0.009	−0.009	−0.008	−0.008
			(0.014)	(0.014)	(0.014)	(0.014)
Black			0.051**	0.064***	0.047**	0.067***
			(0.020)	(0.020)	(0.021)	(0.021)
Hispanic			−0.092***	−0.059***	−0.080***	−0.060***
			(0.014)	(0.013)	(0.013)	(0.014)
College Degree			0.064***	0.050***	0.060***	0.049***
			(0.009)	(0.009)	(0.009)	(0.010)
Man			0.089***	0.090***	0.091***	0.091***
			(0.008)	(0.008)	(0.008)	(0.008)
Fixed Effects:	Year	State-Year	State-Year	State-Year	County-Year	County-Year
Cable Controls:	Y	Y	Y	Y	Y	Y
Demographics:	None	None	Individual	Extensive	Individual	Extensive
Robust F-Stat	36.7	22.8	27.3	29.7	21.6	20.1
Number of Clusters	2589	2589	2589	2379	2589	2379
N	207,950	207,950	207,860	197,551	207,860	197,551
R^2	0.004	0.009	0.020	0.022	0.052	0.054

*p < .1; **p < .05; ***p < .01

Cluster-robust standard errors in parentheses (clustered by cable system). Instrument is the ordinal position of MSNBC on the local system. The omitted category for the availability dummies is systems where neither FNC nor MSNBC is available. Cable system controls include the total number of channels on the system and the number of broadcast channels on the system. "Individual" demographics are measured at the level of the individual respondent. "Extensive" demographics include all of the same individual-level measures plus all of the zip-code-level demographics included in the zip-code-level analysis.

Table 36: Second Stage Regressions: Precinct Voting Data

	2008 McCain Vote Share		
	(1)	(2)	(3)
Pred. Total MSNBC Hrs.	−0.059	−0.059	−0.097**
	(−0.175, 0.055)	(−0.163, 0.022)	(−0.204, −0.015)
Satellite MSNBC Hrs.			0.030**
			(0.002, 0.067)
Fixed Effects:	State-Year	State-Year	State-Year
Cable System Controls:	Y	Y	Y
Demographics:	Basic	Extended	Extended
Number of Clusters	6029	4814	3993
N	22,509	17,400	12,129
R^2	0.730	0.833	0.839

*p < .1; **p < .05; ***p < .01
The first stage is estimated using viewership data for all Nielsen TV households. See first stage tables for description of instruments and control variables. Confidence intervals are generated from 500 independent STID-block-bootstraps of the first and second stage datasets. Reported lower and upper bounds give the central 95 percent interval of the relevant bootstrapped statistic.

In the individual level year-by-year first stage (Table 44), the coefficient tends to be negative and noisy, though still negative and significant in the pooled specification.

E.3 Turnout

In Table 45, we check whether Fox News position correlates with a measure of turnout. We sum the zip code level votes cast across parties in the precinct level data, and divide this number by the age eighteen and over population from the Census at the zip code level.[57] The coefficients on Fox News position tend to be small and noisy except with county fixed effects, where we see a significant negative coefficient on Fox News position. The results suggest that the persuasion estimates in our main specifications could be coming from both the conversion of swing voters and some additional turnout, though it is difficult to say with any precision.

[57]We dropped any zip code whose implied turnout exceeded 1.

Table 37: Second Stage Regressions: NAES / CCES Data (MSNBC)

	P(Vote for Republican Presidential Candidate)		
	(1)	(2)	(3)
Pred. MSNBC Hrs.	−0.073	−0.037	−0.024
	(−0.274, 0.126)	(−0.190, 0.107)	(−0.120, 0.065)
HH Income		0.498	0.425
		(0.415, 0.577)	(0.359, 0.489)
HH Income^2		−0.378	−0.319
		(−0.438, −0.314)	(−0.380, −0.258)
HH Income^3		0.091	0.078
		(0.072, 0.109)	(0.060, 0.097)
Age Quintile 2		0.033	0.025
		(0.017, 0.051)	(0.012, 0.040)
Age Quintile 3		0.036	0.024
		(0.011, 0.061)	(0.007, 0.041)
Age Quintile 4		0.011	−0.001
		(−0.021, 0.045)	(−0.022, 0.023)
Age Quintile 5		0.042	0.029
		(−0.015, 0.100)	(−0.007, 0.067)
White		0.091	0.078
		(0.079, 0.102)	(0.066, 0.090)
Black		−0.351	−0.328
		(−0.371, −0.332)	(−0.347, −0.307)
Hispanic		−0.085	−0.077
		(−0.105, −0.064)	(−0.094, −0.061)
College Degree		−0.082	−0.061
		(−0.093, −0.069)	(−0.069, −0.052)
Man		0.078	0.077
		(0.063, 0.091)	(0.067, 0.087)
Fixed Effects:	State-Year	State-Year	State-Year
Cable Controls:	Y	Y	Y
Demographics:	None	Individual	Extensive
Number of Clusters	6659	6523	5540
N	134,970	122,738	116,009
R^2	0.029	0.112	0.137

The first stage is estimated on all MediaMark/Simmons respondents. See first stage tables for description of instruments and control variables. Confidence intervals are generated from 500 independent STID-block-bootstraps of the first and second stage datasets. Reported lower and upper bounds give the central 95 percent interval of the relevant bootstrapped statistic. "Individual" demographics are measured at the level of the individual respondent. "Extensive" demographics include all of the same individual-level measures plus all of the zip-code-level demographics included in the zip-code-level analysis.

Table 38: Second Stage Regressions: Precinct Voting Data

	2008 McCain Vote Share		
	(1)	(2)	(3)
Pred. Total FNC Hrs.	0.095*	0.097***	0.070*
	(−0.012, 0.269)	(0.020, 0.241)	(−0.016, 0.184)
Pred. Total MSNBC Hrs.	0.028	0.030	−0.019
	(−0.134, 0.293)	(−0.100, 0.350)	(−0.184, 0.188)
Satellite FNC Hrs.			−0.021
			(−0.055, 0.007)
Satellite MSNBC Hrs.			0.005
			(−0.061, 0.059)
Fixed Effects:	State-Year	State-Year	State-Year
Cable System Controls:	Y	Y	Y
Demographics:	Basic	Extended	Extended
Number of Clusters	6029	4814	3993
N	22,509	17,400	12,128
R^2	0.730	0.833	0.840

*p < .1; **p < .05; ***p < .01

The first stage is estimated using viewership data for all Nielsen TV households. See first stage tables for description of instruments and control variables. Confidence intervals are generated from 500 independent STID-block-bootstraps of the first and second stage datasets. Reported lower and upper bounds give the central 95 percent interval of the relevant bootstrapped statistic.

F More on Channel Positions

Our main arguments for the validity of channel positions as instrumental variables for the effect of watching cable news on voting Republican consisted over correlating channel positions with observable variables: demographics (aggregated in the manner they predict voting and viewership), pre-Fox News political variables, and satellite viewership of Fox News, together with the institutional narrative of the period 1992-2000 as leading to effective randomness in channel position assignment. Most of these tests were reassuring, aside from the satellite placebo test on zip code level data, where we find a significant negative correlation with Fox News cable position, albeit one-third the size of the coefficient for cable subscribers, and no such effect on the individual level data. In this section, we further probe the validity for the instrumental variables assumption. First, we show the first stage and satellite placebo for a variety of similarly positioned channels. Second, we show support for the satellite placebo test, by showing that cable and satellite subscribers have similar demographics. Third, we examine whether Fox News viewership is correlated with nearby or future Fox News positions. Fourth, we show that Fox News and MSNBC channel positions are highly

Table 39: Second Stage Regressions: NAES / CCES Data (FNC and MSNBC)

	P(Vote for Republican Presidential Candidate)		
	(1)	(2)	(3)
Pred. FNC Hrs.	0.071	0.199	0.167
	(−1.273, 1.800)	(−0.684, 1.800)	(−1.419, 1.768)
Pred. MSNBC Hrs.	−0.051	−0.005	0.042
	(−0.622, 0.713)	(−0.366, 0.665)	(−0.979, 0.906)
HH Income		0.340	0.290
		(−1.163, 1.041)	(−0.991, 1.742)
HH Income^2		−0.311	−0.263
		(−0.596, 0.321)	(−0.863, 0.281)
HH Income^3		0.084	0.073
		(0.018, 0.116)	(0.010, 0.137)
Age Quintile 2		−0.006	−0.010
		(−0.378, 0.178)	(−0.371, 0.375)
Age Quintile 3		−0.041	−0.045
		(−0.718, 0.311)	(−0.687, 0.687)
Age Quintile 4		−0.100	−0.101
		(−1.090, 0.417)	(−1.069, 0.927)
Age Quintile 5		−0.184	−0.170
		(−2.093, 0.823)	(−2.038, 1.858)
White		0.055	0.051
		(−0.254, 0.217)	(−0.196, 0.271)
Black		−0.383	−0.362
		(−0.710, −0.251)	(−0.732, −0.037)
Hispanic		−0.044	−0.049
		(−0.249, 0.317)	(−0.293, 0.214)
College Degree		−0.059	−0.047
		(−0.158, 0.128)	(−0.168, 0.073)
Man		0.040	0.042
		(−0.310, 0.217)	(−0.307, 0.402)
Fixed Effects:	State-Year	State-Year	State-Year
Cable Controls:	Y	Y	Y
Demographics:	None	Individual	Extensive
Number of Clusters	6659	6523	5540
N	134,970	122,738	116,009
R^2	0.029	0.112	0.137

The first stage is estimated on all MediaMark/Simmons respondents. See first stage tables for description of instruments and control variables. Confidence intervals are generated from 500 independent STID-block-bootstraps of the first and second stage datasets. Reported lower and upper bounds give the central 95 percent interval of the relevant bootstrapped statistic. "Individual" demographics are measured at the level of the individual respondent. "Extensive" demographics include all of the same individual-level measures plus all of the zip-code-level demographics included in the zip-code-level analysis.

Table 40: First Stage Regressions: Satellite and Cable Subscribers, MSNBC Hours

	MSNBC Hours per Week					
	(1)	(2)	(3)	(4)	(5)	(6)
Satellite	0.084***	0.088***	0.092***	0.417***	0.403***	0.393***
	(0.013)	(0.013)	(0.016)	(0.050)	(0.049)	(0.058)
MSNBC Cable Position × cable	−0.002***	−0.002***	−0.002***	−0.004***	−0.004***	−0.004***
	(0.0003)	(0.0003)	(0.0003)	(0.001)	(0.001)	(0.001)
MSNBC Cable Position × sat	−0.0004	−0.0004	−0.0002	−0.00004	−0.0003	−0.0003
	(0.0003)	(0.0003)	(0.0003)	(0.001)	(0.001)	(0.001)
FNC Cable Position × cable	0.001**	0.001**	0.001**	0.002***	0.002***	0.002***
	(0.0003)	(0.0003)	(0.0003)	(0.001)	(0.001)	(0.001)
FNC Cable Position × sat	0.0001	0.0001	0.0002	−0.00005	0.0001	0.0003
	(0.0003)	(0.0003)	(0.0003)	(0.001)	(0.001)	(0.001)
Data:	Zipcode	Zipcode	Zipcode	Individual	Individual	Individual
Fixed Effects:	State-Year	State-Year	State-Year	State-Year	State-Year	State-Year
Cable Controls (interacted):	Y	Y	Y	Y	Y	Y
Demographics:	None	Basic	Extensive	None	Individual	Extensive
Chow Test p-value	1e-06	2e-06	4e-06	2.9e-05	6.7e-05	0.000135
Number of Clusters	5670	5660	4720	2589	2589	2379
N	252,020	251,599	213,335	207,950	207,860	197,551
R^2	0.017	0.021	0.022	0.032	0.039	0.040

*p < .1; **p < .05; ***p < .01

Cluster-robust standard errors in parentheses (clustered by cable system). Columns 1-3 use the zipcode level (Nielsen) data, while 4-6 use the individual level (MediaMark / Simmons) data. Reported N's for the Nielsen data are larger than in the main tables because we treat the satellite viewership and cable viewership in the same zip code as separate observations. Instrument is the ordinal position of MSNBC on the local system. The omitted category for the availability dummies is systems where neither FNC nor MSNBC is available. Cable system controls include the total number of channels on the system and the number of broadcast channels on the system, interacted with a dummy for the individual being a satellite subscriber. See first stage tables for descriptions of the control variable sets.

Table 41: MSNBC cable position coefficient on predicted MSNBC viewing / voting, and 1996 voting and contributions.

	Individual		Zip	
Predicted MSNBC Viewing	0.00011	−0.00005	−0.00005	−0.00010
	(0.00011)	(0.00018)	(0.00006)	(0.00009)
Predicted Voting	0.00009	0.00005	0.00036***	0.00034**
	(0.00010)	(0.00019)	(0.00013)	(0.00016)
1996 County R Vote Share	−0.00021	−0.00012	0.00016	0.00004
	(0.00026)	(0.00015)	(0.00012)	(0.00010)
1996 Zip R Contrib Share	−0.00007	0.00008	0.00017	0.00003
	(0.00037)	(0.00021)	(0.00019)	(0.00016)
Covariate Set	Individual	Extensive	Basic	Extensive

*p < .1; **p < .05; ***p < .01
Cluster-robust standard errors in parentheses (clustered by cable system). Rows 1 and 2 regress predicted hours of MSNBC and predicted Republican vote share, respectively, on MSNBC cable position. The predicting regressions exclude MSNBC position but include the indicated set of demographic controls. Rows 3 and 4 regress indicators of pre-treatment political attitudes (1996 county-level Republican presidential vote share and 1996 zipcode-level Republican campaign contribution share) on MSNBC cable position.

Table 42: Reduced Form Regressions: NAES / CCES Data, by Year

	P(Vote for Republican Presidential Candidate)			
	2000	2004	2008	Interacted
FNC Cable Position	−0.0003	−0.0003*	−0.0003	−0.0003***
	(0.0002)	(0.0002)	(0.0002)	(0.0001)
MSNBC Cable Position	−0.0003	0.0004*	−0.00001	0.0001
	(0.0002)	(0.0002)	(0.0001)	(0.0001)
Fixed Effects:	State	State	State	State
Cable Controls:	Y	Y	Y	Y
Demographics:	Extensive	Extensive	Extensive	Interacted
Number of Clusters	4404	3829	3194	5582
N	40,559	41,607	34,299	116,465
R^2	0.126	0.144	0.159	0.141

*p < .1; **p < .05; ***p < .01
Cluster-robust standard errors in parentheses (clustered by cable system). Columns (1)-(3) show the position coefficients when the model is run separately for each year. In column (4), the extensive demographic set is interacted with dummy variables for each year, allowing the demographic effects on voting to vary flexibly by year.

Table 43: First Stage Regressions: Nielsen Data, All Households, by Year

	FNC Hours Per Week				
	2005	2006	2007	2008	Interacted
FNC Cable Position	-0.003^{***}	-0.003^{***}	-0.002^{***}	-0.004^{***}	-0.003^{***}
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
MSNBC Cable Position	0.002^{*}	0.001	0.001	0.001	0.001^{**}
	(0.001)	(0.001)	(0.001)	(0.001)	(0.0005)
System has MSNBC Only	-0.049	-0.146	-0.119	0.497	0.030
	(0.118)	(0.090)	(0.108)	(0.485)	(0.120)
System has FNC Only	0.487^{***}	0.371^{***}	0.333^{***}	0.418^{***}	0.406^{***}
	(0.086)	(0.071)	(0.074)	(0.105)	(0.044)
System has Both	0.310^{***}	0.318^{***}	0.286^{***}	0.305^{***}	0.311^{***}
	(0.084)	(0.079)	(0.086)	(0.112)	(0.048)
Fixed Effects:	State	State	State	State	State
Cable System Controls:	Y	Y	Y	Y	Y
Demographics:	Extended	Extended	Extended	Extended	Extended x Year
Robust F-Stat	9.9	12.7	6.9	15.2	28.9
Number of Clusters	4692	4572	4452	4302	4848
N	15,198	15,242	15,352	15,349	61,141
R^2	0.068	0.065	0.078	0.073	0.071

$^{*}p < .1$; $^{**}p < .05$; $^{***}p < .01$

Cluster-robust standard errors in parentheses (clustered by cable system). Instrument is the ordinal position of FNC on the local system. The omitted category for the availability dummies is systems where neither FNC nor MSNBC is available. Columns (1)-(4) give the FNC position coefficient when the first stage model is run separately by year. In Column (5), the extensive demographic set is interacted with dummy variables for each year, allowing the demographic effects on viewership to vary flexibly by year.

Table 44: First Stage Regressions: MediaMark / Simmons Data, All Respondents, by Year

	FNC Hours Per Week									
	2000	2001	2002	2003	2004	2005	2006	2007	2008	Interacted
FNC Cable Position	−0.004***	−0.002	−0.002	−0.001	−0.002	0.001	−0.005**	−0.001	0.003	−0.002**
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
MSNBC Cable Position	0.0001	−0.00004	0.0001	0.0004	0.002	0.0003	0.001	0.001	0.002	0.001
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
System MSNBC Only	0.398***	0.501***	0.377*	0.207	0.583**	−0.480	1.068***	0.533*	0.335	0.407***
	(0.094)	(0.149)	(0.203)	(0.190)	(0.282)	(0.322)	(0.301)	(0.300)	(0.405)	(0.069)
System FNC Only	0.038	0.091	−0.229	−0.255	−0.147	−1.429***	0.312	−1.138***	−0.442	0.013
	(0.092)	(0.126)	(0.193)	(0.226)	(0.339)	(0.417)	(0.469)	(0.303)	(0.333)	(0.064)
System has Both	0.329***	0.355***	0.295	0.008	0.497*	−0.275	0.983***	0.296	0.227	0.284***
	(0.100)	(0.132)	(0.193)	(0.210)	(0.256)	(0.327)	(0.291)	(0.313)	(0.367)	(0.069)
Fixed Effects:	State	State	State	State	State	State	State	State	State	State
Cable System Controls:	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Demographics:	Extended	Extended	Extended	Extended	Extended	Extended	Extended	Extended	Extended	Extended x Year
Robust F-Stat	13	2.1	1.5	0.3	1.3	0.3	4.6	0.2	1.4	5.3
Number of Clusters	811	782	747	741	738	684	679	712	1330	2379
N	24,245	24,416	23,229	22,864	23,384	22,909	22,476	23,002	11,026	197,551
R^2	0.018	0.025	0.029	0.032	0.038	0.047	0.046	0.054	0.067	0.045

*p < .1; **p < .05; ***p < .01

Cluster-robust standard errors in parentheses (clustered by cable system). Instrument is the ordinal position of FNC on the local system. The omitted category for the availability dummies is systems where neither FNC nor MSNBC is available. Columns (1)-(9) run the model separately for each year. In Column (10), the extensive demographic set is interacted with dummy variables for each year, allowing the demographic effects on viewership to vary flexibly by year.

Table 45: Reduced Form Regressions: Precinct Voting Data, Turnout

	2008 Presidential Turnout					
	(1)	(2)	(3)	(4)	(5)	(6)
FNC Cable Position	0.0004*	−0.0001	−0.0001	−0.0001	−0.0002	−0.0003**
	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
MSNBC Cable Position	−0.0001	0.0001	−0.0001	−0.00002	−0.00003	0.00003
	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Fixed Effects:	Year	State-Year	State-Year	State-Year	County-Year	County-Year
Cable System Controls:	Y	Y	Y	Y	Y	Y
Demographics:	None	None	Basic	Extended	Basic	Extended
Number of Clusters	5516	5516	5513	4508	5513	4508
N	20,390	20,390	20,353	16,274	20,353	16,274
R^2	0.020	0.196	0.404	0.465	0.522	0.596

*p < .1; **p < .05; ***p < .01
The dependent variable is turnout in the presidential election, measured as number of presidential votes cast divided by the voting-age population in the zip code. Cluster-robust standard errors in parentheses (clustered by cable system).

correlated with the best available position on the system at the time they were added.

F.1 First Stage for other Cable Channels

In Table 46, we display the coefficients on own-channel position for a variety of other cable channels. For each channel, we run a stacked regression where we interact cable channel position with dummy variables for whether the individual subscribers to cable or to satellite. As with the other checks on instrument validity, the results are mostly reassuring but not perfect. 26 out of 32 channels have a significantly negative position effect on cable subscribers at 99% confidence (2 more, for a total of 28 out of 32 at 95% confidence). 9 out of 32 have a significantly negative cable channel position effect on satellite subscribers at 90% confidence (only 2 at 99%), suggesting some degree of endogenous positioning for these channels.

Table 46: First Stage Regressions for Other Channels: MediaMark / Simmons Data, All Respondents

	Own Position Effect			Own Position Effect	
Channel	Cable Subscribers	Satellite Subscribers	Channel	Cable Subscribers	Satellite Subscribers
ABC Family	−0.0033***	0.0001	FX	−0.0024***	−0.0009
	(0.0007)	(0.0008)		(0.0004)	(0.0006)
A&E	−0.0033***	0.0004	HGTV	−0.0037***	−0.0022**
	(0.0006)	(0.0010)		(0.0005)	(0.0009)
AMC	−0.0003	0.0008	History Channel	−0.0048***	−0.0032***
	(0.0006)	(0.0007)		(0.0007)	(0.0011)
Animal Planet	−0.0023***	0.0001	Lifetime	−0.0021**	−0.0030**
	(0.0005)	(0.0009)		(0.0009)	(0.0012)
BET	−0.0015***	−0.0001	MSNBC	−0.0034***	−0.0005
	(0.0004)	(0.0008)		(0.0006)	(0.0008)
Bravo	−0.0038***	−0.0003	MTV	−0.0009***	−0.0011**
	(0.0003)	(0.0004)		(0.0003)	(0.0005)
Cartoon Network	−0.0008	−0.0018**	Nickelodeon	−0.0014***	0.0005
	(0.0005)	(0.0008)		(0.0003)	(0.0006)
CMT	−0.0012***	−0.0007**	SyFy	−0.0039***	−0.0005
	(0.0002)	(0.0003)		(0.0005)	(0.0008)
CNBC	−0.0017**	−0.0004	Spike	−0.0007	−0.0014*
	(0.0007)	(0.0009)		(0.0006)	(0.0008)
Comedy Central	−0.0021***	0.0005	TLC	−0.0028***	−0.0004
	(0.0005)	(0.0008)		(0.0005)	(0.0007)
Court TV	−0.0026***	0.0003	TNT	−0.0043***	−0.0021*
	(0.0004)	(0.0007)		(0.0009)	(0.0012)
Discovery Channel	−0.0027***	−0.0012	Travel Channel	−0.0022***	−0.000004
	(0.0008)	(0.0012)		(0.0003)	(0.0003)
Disney	−0.0027***	−0.0006	TV Land	−0.0015***	−0.0014***
	(0.0003)	(0.0006)		(0.0003)	(0.0004)
E!	−0.0020***	−0.0004	USA	−0.0022***	−0.0016
	(0.0004)	(0.0005)		(0.0007)	(0.0011)
ESPN2	−0.0021***	0.0008	VH1	−0.0011***	0.0001
	(0.0005)	(0.0009)		(0.0003)	(0.0004)
Food Network	−0.0035***	−0.0015	Weather Channel	−0.0006	0.0025
	(0.0006)	(0.0010)		(0.0012)	(0.0017)

*p < .1; **p < .05; ***p < .01

Cluster-robust standard errors in parentheses (clustered by cable system). The main regressors are the ordinal position and availability of the indicated channel on the local cable system. All regressions include controls for individual and zipcode level demographics as well as cable system characteristics, and state-year fixed effects.

F.2 Cable and Satellite Subscriber Observable Correlations

Across locations, satellite subscriber characteristics correlate strongly with cable subscriber characteristics. Table 47 shows the regression coefficients of mean satellite subscriber characteristics on mean cable subscriber characteristics in the same cable system territory, nearly all of which are positive and large. Since the means of these characteristics are measured with sampling error - as they are constructed from the television viewership survey samples - the OLS coefficients are attenuated. In the table, we address this measurement error problem in two ways.[58] First, we progressively restrict the regression to markets with more and more survey respondents as these markets will have less sampling error. Second, we instrument for the mean cable characteristic with lead and lagged mean cable characteristic. Survey respondents are sampled independently from year to year. Consistent with measurement error, the coefficients generally tend upwards to one when we restrict to system-years with more respondents. Furthermore, the IV coefficients are generally very close to one.

In the same vein, we can look directly at viewership patterns. Satellite viewers watch 1.2 fewer minutes per week of Fox News Channel on average relative to cable viewers (on an overall mean of 90 minutes). At the bottom of Table 47, we regress predicted mean viewership of satellite subscribers (predicted from demographics) on that of cable subscribers. We also regress the cable system territory mean residual viewership of satellite subscribers (net of demographics) on the cable system territory mean residual viewership of cable subscribers. Across the board, cable and satellite subscribers within the same cable system territory display strong correlations of both demographics and viewing behavior.

F.3 Future and Nearby Channel Positions

We examine whether future cable news channel position predicts current viewership conditional on current position. If political tastes are shifting over time, and channel positions are endogenous but sticky, then future position should predict current view-

[58] One could also dis-attenuate the coefficients as the variance induced by sampling is known. This exercise is complicated because each cable system-year has different sampling variance.

Characteristic	N>0	N>10	N>50	N>100	IV
Black	0.649***	0.733***	0.836***	0.978***	1.043***
	(0.0129)	(0.0141)	(0.0242)	(0.0405)	(0.0348)
Num Zips	5,843	4,685)	1,252	342	2,436
College	0.454***	0.576***	0.728***	0.793***	1.013***
	(0.0165)	(0.0193)	(0.0371)	(0.0633)	(0.0707)
Num Zips	5,843	4,685)	1,252	342	2,436
HH Income	0.448***	0.603***	0.781***	0.870***	0.973***
	(0.0150)	(0.0164)	(0.0287)	(0.0646)	(0.0656)
Num Zips	5,843	4,685)	1,252	342	2,436
Age	0.264***	0.350***	0.414***	0.449***	0.812***
	(0.0162)	(0.0197)	(0.0411)	(0.0704)	(0.147)
Num Zips	5,843	4,685)	1,252	342	2,436
Hispanic	0.618***	0.758***	0.850***	0.842***	0.966***
	(0.0143)	(0.0157)	(0.0250)	(0.0365)	(0.0380)
Num Zips	5,843	4,685)	1,252	342	2,436
Party ID R	0.104***	0.285***	0.448***	0.588***	1.348***
	(0.0364)	(0.0567)	(0.127)	(0.215)	(0.626)
Num Zips	896	453)	78	25	361
Party ID D	0.165***	0.274***	0.341***	0.548***	1.348*
	(0.0359)	(0.0583)	(0.126)	(0.215)	(0.626)
Num Zips	896	453)	78	25	361
Predicted Fox News	0.737***	0.833***	0.961***	0.967***	1.004***
	(0.0133)	(0.0137)	(0.0202)	(0.0291)	(0.0436)
Num Zips	5,843	4,685)	1,252	342	2,436
Predicted MSNBC Viewing	0.498***	0.505***	0.581***	0.679***	0.725***
	(0.0118)	(0.0130)	(0.0254)	(0.0436)	(0.0563)
Num Zips	5,843	4,685)	1,252	342	2,436
Fox News Residual	0.0977***	0.165***	0.392***	0.424***	0.688**
	(0.0195)	(0.0253)	(0.0510)	(0.0814)	(0.254)
MSNBC Residual	0.0814***	0.117***	0.381***	0.567***	0.320**
	(0.0158)	(0.0190)	(0.0504)	(0.0873)	(0.129)

Note: The first column of coefficients uses all cable system territory-years. These coefficients are attenuated because the mean cable is constructed from samples of survey respondents which can be as few as 2 per cable system territory-year. The second column of coefficients restricts to those with more than ten surveyed respondents. The third column of coefficients restricts to those with more than fifty survey respondents. The fourth column of coefficients restricts to those with more than 100 survey respondents. The final column of coefficients are uses lead and lagged means of cable subscribers as instrumental variables, as respondents are sampled independently from year to year.

Table 47: Regression coefficients of demographic characteristics and cable news viewership of satellite subscribers on the characteristics of cable subscribers in the same cable territory-year in MediaMark / Simmons viewership data.

ership. A location which has become more Republican would watch more Fox News, but, if channel positions were endogenously tailored and sticky, their channel position may not have adjusted yet, so future position, after adjustment, would be informative about current ideology. The zip-level results for Fox News are in Table 48. Position in 2008 does not predict viewership in 2005 conditional on position in 2005.

Table 48: First Stage Regressions: Nielsen Data, Future Position Placebo

	Cable Subscribers		All Households		Satellite Subscribers	
FNC Position in 2005	-0.0056^{***}	-0.0053^{**}	-0.0026^{**}	-0.0026^{*}	0.0009	0.0007
	(0.0020)	(0.0023)	(0.0012)	(0.0014)	(0.0024)	(0.0024)
FNC Position in 2008	0.0006	−0.0004	0.0006	−0.0001	−0.0002	−0.0006
	(0.0020)	(0.0023)	(0.0012)	(0.0014)	(0.0023)	(0.0021)
Fixed Effects:	State-Year	State-Year	State-Year	State-Year	State-Year	State-Year
Cable System Controls:	Y	Y	Y	Y	Y	Y
Demographics:	Basic	Extended	Basic	Extended	Basic	Extended
Number of Clusters	4255	3839	4501	4006	4247	3791
N	15,343	13,387	16,633	14,233	14,258	12,263
R^2	0.0336	0.0367	0.0623	0.0708	0.0279	0.0385

$^{*}p < .1$; $^{**}p < .05$; $^{***}p < .01$

Cluster-robust standard errors in parentheses (clustered by cable system). The outcome is Fox News hours per week in 2005 among cable subscribers, all households, and satellite subscribers, respectively in columns (1)-(2), (3)-(4), and (5)-(6). We include only zip codes that had access to Fox News in 2005, and regress hours per week on both the actual position in 2005, and the future position in the same zip code in 2008.

We also examine whether Fox News position in nearby systems predicts local viewership. If unobserved political tastes were uncorrelated with local positions, then they should also be uncorrelated with nearby positions even though ideology and demographics are correlated nearby. For each zip code-year in the data, we found the nearest zip code in the data for that year which wasn't in the same cable system. The results are in Table 49. While we do see a significant negative correlation of nearby position on local viewership in our preferred specification, there is an explanation borne out in the data which counters this as a threat to the identifying assumption. We regressed 1996 county level Republican vote share on local position and nearby position. As we show in Table 11, local positions do not significantly correlate with county level 1996 Republican vote share. However, in Table 50, we see that nearby positions do. Such a correlation in the data, for whatever reason, would drive the observed correlation of Fox News viewership that we see. However, the reason behind the correlation is likely

unrelated to targeting. If such targeting is going on, system managers are targeting Fox News to unobserved political tastes in nearby zip codes, but not in the zip codes they serve, which strains credibility. Furthermore, the nearby position effect drops further as we condition on local satellite viewership of Fox News, which we also do in the main tables.

Table 49: First Stage Regressions: Nielsen Data, All Households, Nearby Position

	FNC Hours per Week					
	(1)	(2)	(3)	(4)	(5)	(6)
FNC Position	−0.0023***	−0.0019***	−0.0025***	−0.0027***	−0.0017*	−0.0025***
	(0.0007)	(0.0006)	(0.0005)	(0.0005)	(0.0010)	(0.0004)
Nearby FNC Position	−0.0011**	−0.0008	−0.0010**	−0.0013**	−0.0001	−0.0007*
	(0.0006)	(0.0006)	(0.0005)	(0.0005)	(0.0008)	(0.0004)
Fixed Effects:	Year	State-Year	State-Year	State-Year	County-Year	State-Year
Cable System Controls:	Y	Y	Y	Y	Y	Y
Demographics:	None	None	Basic	Extended	Extended	Extended+Sat.Hrs.
Number of Clusters	5825	5825	5815	4847	4847	4759
N	73,064	73,064	72,896	60,722	60,722	51,711
R^2	0.0113	0.0248	0.0556	0.0705	0.2973	0.3974

*p < .1; **p < .05; ***p < .01
Cluster-robust standard errors in parentheses (clustered by cable system). FNC hours per week (among all Nielsen households) are regressed on both the actual position and the position on a neighboring system. Regressions include controls for availability on both the actual and neighboring system.

F.4 Best Available Channel Position

We demonstrate one example of this historical influence in Table 51. We regress the ordinal positions of Fox News and MSNBC on the system's best available ordinal position in 1998, along with a control for the overall size of the system - its total number of channels.[59] The best available position in 1998 is a strong predictor of the current position, *even though* the positioning data here extends through 2008. A

[59]Our lineup data begins in 1998, and hence we restrict the sample for this regression to cable systems that did not have Fox/MSNBC in 1998. "Best available" is defined as the lowest open slot (unoccupied by an existing channel) in the region of the lineup dedicated to cable (i.e. non-network and non-local-access) channels. We define the cable region by locating the positions of CNN, ESPN, TNT, and The Discovery Channel, and consider any open slot above at least one of those channels to be available.

Table 50: Regression of 1996 County Republican Share on Own and Nearby Position

	1996 County Republican Vote Share				
	(1)	(2)	(3)	(4)	(5)
FNC Position	0.0002	0.0002	0.0001	−0.0001	0.00003
	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0001)
Nearby FNC Position	−0.0002	0.0001	−0.00001	−0.0002**	−0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Fixed Effects:	Year	State-Year	State-Year	State-Year	State-Year
Cable System Controls:	Y	Y	Y	Y	Y
Demographics:	None	None	Basic	Extended	Extended+Sat.Hrs.
Number of Clusters	5807	5807	5806	4847	4760
N	73,308	73,308	73,291	61,092	51,853
R^2	0.0474	0.3178	0.4619	0.5667	0.5540

*p < .1; **p < .05; ***p < .01

Cluster-robust standard errors in parentheses (clustered by cable system). The 1996 Republican presidential vote share (defined at the county level) is regressed on both the actual position and the position on a neighboring system. Regressions include controls for availability on both the actual and neighboring system.

system's channel configuration prior to the addition of Fox or MSNBC exerts a lasting influence on the positioning of Fox and MSNBC today.

Coefficient	MSNBC	Fox
(Intercept)	33.8	30.7
	(0.573)	(0.432)
Number of Channels	0.032	0.032
	(0.003)	(0.002)
Best Available	0.181	0.148
	(0.014)	(0.012)
R^2	0.066	0.077
N	29,337	38,328

Table 51: Ordinal channel position vs. best available ordinal channel position, among systems where the channel (MSNBC or Fox News) was added in 1998 or later. Standard errors clustered by cable system.

G Derivation of Relationship between Second Stage Estimates

The second stage estimates using the cable-only first stage, and the second stage estimates using the pooled first stage, are related asymptotically according to the fraction of cable subscribers in the population. To see this, consider the simplest version of the model with a univariate first stage consisting of only the cable position, and a constant fraction of cable subscribers in the population, ϕ_C. The first stage equations for cable, satellite, and pooled subscribers, respectively, are:

$$\begin{aligned} h_i^C &= \zeta p_i + \epsilon_i^C \\ h_i^S &= \epsilon_i^S \\ h_i^P &= \phi^C \zeta p_i + \phi_C \epsilon_i^C + (1-\phi_C)\epsilon_i^S \end{aligned}$$

The cable-only and pooled first stage estimates $\hat{\zeta}$ are then:

$$\begin{aligned} \hat{\zeta}^C &= (p'p)^{-1}p'h^C = \zeta + (p'p)^{-1}p'\epsilon^C \\ \hat{\zeta}^P &= (p'p)^{-1}p'h^P = \phi^C\zeta + (p'p)^{-1}p'(\phi_C\epsilon^C + (1-\phi_C)\epsilon^S) \end{aligned}$$

So, the cable-only first stage is consistent for the parameter ζ under the assumption that positions are uncorrelated with unobserved taste, whereas the pooled estimate is scaled down. The population equation for the second stage (effect of viewership on voting) is:

$$v_i = \rho h_i^P + \epsilon_i^V$$

Estimating this equation via 2SLS using the predicted values of hours $\hat{h}_i^C$ from the cable first stage would yield:

$$\begin{aligned}
\hat{\rho}_{2SLS}^C &= (h_C' p (p'p)^{-1} p' h_C)^{-1} h_C' p (p'p)^{-1} p' (\rho(\phi_C h^C + (1-\phi_C) h^S) + \epsilon^V) \\
&= \rho\phi_C + (h_C' p (p'p)^{-1} p' h_C)^{-1} h_C' p (p'p)^{-1} p' \epsilon^V \\
&\to \rho\phi_C
\end{aligned}$$

Where the probability limit in the last line follows from the necessary assumptions for 2SLS and the form of the structural equations chosen here. Similarly, estimating using the predicted values of hours $\hat{h}_i^P$ from the pooled first stage would yield:

$$\begin{aligned}
\hat{\rho}_{2SLS}^P &= (h_P' p (p'p)^{-1} p' h_P)^{-1} h_P' p (p'p)^{-1} p' (\rho h^P + \epsilon^V) \\
&= \rho + (h_P' p (p'p)^{-1} p' h_P)^{-1} h_P' p (p'p)^{-1} p' \epsilon^V \\
&\to \rho
\end{aligned}$$

Asymptotically, then, if the instrument is valid the second stage estimate of $\hat{\rho}$ using the cable-only first stage is simply scaled down from the estimate using the pooled first stage by a ratio equal to ϕ_C, the probability of an individual subscribing to cable. The pooled version is the correct estimate; the cable-only first stage version is biased downward. These results generalize easily to the addition of covariates, and to non-constant ϕ_C. In the latter case the ratio between the coefficients is a weighted-average value of the individual subscription probabilities $\phi_{i,C}$, where the weights are related to the squared deviation of p_i from its mean.

If the exclusion restriction is violated ($E[p'\epsilon_V] \neq 0$), however, then this relationship

does not hold. In fact, one can show that in our case, where the most likely bias is that both $E[p'\epsilon_V] < 0$ (FNC is in lower position in more Republican places) and $\zeta < 0$ (higher positions lead to lower ratings), the ratio $\hat{\rho}_C/\hat{\rho}_P$ is biased towards one:

$$\begin{aligned}
\frac{\hat{\rho}_C}{\hat{\rho}_P} &= \frac{\phi_C\rho + A\epsilon^V}{\rho + B\epsilon^V} \\
A\epsilon^V &= (h_C'p(p'p)^{-1}p'h_C)^{-1}h_C'p(p'p)^{-1}p'\epsilon^V \rightarrow \frac{1}{\phi_C\zeta}E[(p'p)^{-1}p'\epsilon^V] \\
B\epsilon^V &= (h_C'p(p'p)^{-1}p'h_C)^{-1}h_C'p(p'p)^{-1}p'\epsilon^V \rightarrow \frac{1}{\zeta}E[(p'p)^{-1}p'\epsilon^V]
\end{aligned}$$

In other words, if the exclusion restriction is violated in the way we would expect if there were endogenous positioning, the two estimates should look similar.

H Solution Algorithm for Viewership Problem

Define ρ_{ict} as the Lagrange multipliers associated with the non-negativity constraints on T_{ict}. By complementary slackness, if $\rho_{ict} > 0$ then $T_{ict} = 0$. From the first order condition, $\rho_{ict} = \lambda_{it} - \gamma_{ict}$ where λ_{it} is the Lagrange multiplier on consumer i's budget constraint. Therefore, T_{ict} can be zero if and only if $\gamma_{ict} < \lambda_{it}$.

For all the channels with $T_{ict} > 0$, $\lambda_{it} = \gamma_{ict}/(1+T_{ict})$. Additionally, each consumer faces a time-budget constraint, $\sum_c T_{ict} = B$, where B is the total time available (in our scaling, the number of hours in a week: 168). This gives a system of equations with solution:

$$\lambda_{it} = \frac{1 + \sum_{c^+} \gamma_{ic^+t}}{B + C^+}$$

where c^+ are the indices of the channels that i watches a positive amount, and C^+ is the total number of such channels. Given this result, the iterative solution is to replace the γ_{ict}'s below the cutoff $(1 + \sum_c \gamma_c)/(B + C)$ with zero. If there were any γ_{ict}'s below this threshold, we now have a new cutoff defined by the remaining positive γ_{ict}'s, and we repeat the process again. There are at most C steps of this until we hit the final set of positive γ_{ict}'s, at which point we compute the times watched as:

$$T_{ict} = (T + C^+)\frac{\gamma_{ict}}{\sum_{c^+} \gamma_{ic^+t}} - \mathbf{1}(\gamma_{ict} > 0)$$

I Comparison of Regression Coefficients in Real and Simulated Data

	CNN Hours		FNC Hours		MSNBC Hours	
Regressor	Real	Simulated	Real	Simulated	Real	Simulated
CNN Position	-0.0038	-0.0081	-0.0009	0.0010	-0.0007	0.0002
FOX Position	0.0015	-0.0002	-0.0014	-0.0068	0.0014	-0.0001
MSN Position	0.0002	-0.0004	0.0007	-0.0001	-0.0027	-0.0036
FOX Only	0.0399	-0.0020	0.3803	1.4258	-0.0498	0.0450
MSN Only	-0.0041	0.0119	0.0133	0.1842	0.3527	0.7988
Both Available	0.0065	0.0047	0.2759	1.3656	0.2746	0.7828
Number of Channels	0.0007	-0.0001	0.0002	0.0002	-0.0003	-0.0003
Number of Broadcast Channels	-0.0079	-0.0040	-0.0060	-0.0030	0.0005	-0.0012
Age Quintile 2	0.2562	0.3476	0.1795	0.3066	0.0914	0.1273
Age Quintile 3	0.4169	0.3640	0.3611	0.2880	0.1399	0.1436
Age Quintile 4	0.6064	0.5530	0.5227	0.4036	0.2062	0.1857
Age Quintile 5	1.2477	1.0895	1.0714	1.0891	0.3795	0.4072
Income	0.6722	0.3252	0.7093	-0.0924	0.4000	0.1373
Income^2	-0.2373	-0.0340	-0.3057	-0.3614	-0.1483	-0.2263
Income^3	0.0227	-0.0013	0.0324	0.0688	0.0149	0.0377
White	-0.1578	-0.1092	0.1775	0.3241	-0.0098	-0.0283
Black	0.0441	0.0020	0.1719	-0.0732	0.0493	-0.0101
Hispanic	-0.1760	-0.2219	-0.1727	-0.1562	-0.0941	-0.0034
College Graduate	0.1864	0.1222	-0.1196	-0.0885	0.0633	0.0891
Man	0.1399	0.1128	0.1751	0.1302	0.0886	0.0978
1996 County R Share	-0.1960	0.0391	0.6434	0.0252	-0.0215	-0.0024

Table 52: Comparison of regression coefficients in real data and simulations: first stage regression at the individual level. Dependent variable is individual-level hours watched of each channel.

This section reports the fit of the indirect inference estimation routine. Tables 52 and 53 report the individual and zip-code level first stage regression coefficients, respectively. Table 54 reports the auxiliary regression of an indicator for watching any of the channel on individual demographics and cable positions. Tables 55 and 56 report the second stage IV and OLS regressions at the individual and zip levels..

	CNN Hours		FNC Hours		MSNBC Hours	
Regressor	Real	Simulated	Real	Simulated	Real	Simulated
CNN pos	-0.0027	-0.0053	0.0015	-0.0007	0.0001	0.0001
FOX pos	0.0010	-0.0011	-0.0032	-0.0038	0.0006	-0.0002
MSN pos	0.0006	-0.0005	0.0011	-0.0006	-0.0015	-0.0022
FOX Only	-0.1162	-0.0418	0.3943	0.9637	-0.0494	-0.0220
MSN Only	-0.0996	-0.1249	0.0601	-0.0860	0.1369	0.4307
Both Available	-0.1723	-0.0337	0.3117	0.9416	0.0670	0.4281
Number of Channels	-0.0001	-0.0003	-0.0001	-0.0003	0.0000	-0.0001
Number of Broadcast Channels	0.0008	0.0074	-0.0087	0.0067	0.0016	0.0012
Nielsen Diary Market	-0.0202	0.0117	-0.1161	-0.0204	-0.0320	-0.0250
Log Population Density	-0.0169	-0.0126	-0.0128	-0.0040	-0.0012	-0.0001
Percent Black	0.2266	0.1729	-0.4383	-0.2390	0.0432	0.1955
Percent Asian	-0.0232	0.5075	-0.3823	0.1951	-0.1242	0.0862
Percent Other	0.3105	0.3336	0.4381	0.0068	0.1284	0.1379
Percent Hispanic	-0.1073	-0.0798	-0.3061	0.0329	-0.0861	0.0036
Percent Male	-0.1166	1.0218	1.9715	-0.0102	0.1038	0.0136
Percent Age 10-20	0.0491	1.2495	-1.3618	-2.0723	0.0400	-0.4092
Percent Age 20-30	0.6114	0.0994	-1.4469	-0.7975	0.2508	-0.1261
Percent Age 30-40	1.2063	0.7209	-1.8194	-1.8423	0.5543	-0.3007
Percent Age 40-50	-0.1067	0.0677	-2.6682	-0.3158	-0.0457	0.0224
Percent Age 50-60	0.3986	0.9035	-1.4958	-0.6848	0.3443	-0.0247
Percent Age 60-70	1.4440	0.8183	2.2043	-1.4159	0.8840	-0.2209
Percent Age 70-80	2.0344	1.9274	3.9573	1.4474	0.7453	0.5033
Percent Age 80+	1.8824	1.4368	-1.5369	-1.1384	0.8457	0.1213
Income Decile 2	-0.0137	-0.0313	0.0245	-0.0575	-0.0164	-0.0173
Income Decile 3	0.0006	-0.0215	0.0045	-0.0967	-0.0237	-0.0131
Income Decile 4	-0.0514	-0.0082	0.0422	-0.0686	-0.0236	-0.0098
Income Decile 5	-0.0394	-0.0062	-0.0140	-0.0666	-0.0302	0.0059
Income Decile 6	-0.0449	-0.0038	-0.0504	-0.0971	-0.0363	-0.0067
Income Decile 7	-0.0519	-0.0003	-0.0127	-0.0729	-0.0333	0.0026
Income Decile 8	-0.0533	0.0448	-0.0020	-0.0950	-0.0312	-0.0121
Income Decile 9	-0.0779	0.0777	0.0044	-0.1898	-0.0637	-0.0241
Income Decile 10	-0.0325	0.1459	-0.0331	-0.2004	-0.0597	-0.0097
Percent HS Grad	0.0317	0.4661	0.4467	0.7625	0.0000	-0.0719
Percent Some College	0.4148	0.1216	0.8364	0.1752	0.1836	0.0805
Percent Bachelors'	0.3555	0.0888	1.2802	-0.0027	0.2346	-0.1006
Percent Post-Grad	0.5086	0.8272	0.3698	0.4214	0.2741	0.0310
Percent Suburban	0.0957	-0.1202	0.2656	-0.2242	0.0592	-0.0810
Percent Urban	0.0757	-0.0605	0.2149	-0.1736	0.0607	-0.1093
1996 County R Share	-0.2573	-0.0467	0.4372	0.0262	-0.1080	-0.1020

Table 53: Comparison of regression coefficients in real data and simulations: first stage regression at the zipcode level. Dependent variable is zipcode-level average hours watched of each channel.

	CNN-Zero		**FNC-Zero**		**MSNBC-Zero**	
Regressor	Real	Simulated	Real	Simulated	Real	Simulated
CNN Position	-0.0008	0.0000	-0.0002	0.0002	-0.0002	0.0002
FOX Position	0.0003	-0.0001	-0.0005	-0.0004	0.0004	0.0000
MSN Position	0.0000	-0.0001	0.0002	0.0000	-0.0009	-0.0003
FOX Only	0.0159	0.0055	0.0815	0.2355	-0.0075	0.0045
MSN Only	0.0299	0.0067	0.0063	0.0035	0.1223	0.1863
Both Available	0.0170	0.0099	0.0646	0.2330	0.0986	0.1834
Number of Channels	0.0003	0.0000	0.0003	0.0000	0.0001	-0.0001
Number of Broadcast Channels	-0.0019	-0.0008	-0.0019	-0.0007	-0.0007	-0.0003
Age Quintile 2	0.0568	-0.0102	0.0394	-0.0226	0.0306	-0.0042
Age Quintile 3	0.0968	0.1160	0.0842	0.1232	0.0437	0.0529
Age Quintile 4	0.1321	0.1628	0.1080	0.1365	0.0590	0.0753
Age Quintile 5	0.2200	0.2513	0.1688	0.1403	0.0837	0.0072
Income	0.3180	0.3448	0.2445	0.3422	0.2101	0.2575
Income^2	-0.1176	-0.1449	-0.0984	-0.0754	-0.0794	-0.0243
Income^3	0.0115	0.0137	0.0100	0.0070	0.0079	0.0003
White	-0.0257	-0.0022	0.0197	-0.0473	-0.0004	-0.0245
Black	0.0119	0.0220	0.0489	0.1059	0.0090	0.0560
Hispanic	-0.0437	-0.0481	-0.0381	-0.0194	-0.0350	-0.1115
College Graduate	0.0611	0.0738	-0.0182	-0.0179	0.0385	0.0318
Man	0.0433	0.0467	0.0474	0.0628	0.0371	0.0391
1996 County R Share	0.0203	-0.0031	0.1490	-0.0052	0.0330	-0.0067

Table 54: Comparison of regression coefficients in real data and simulations. Dependent variable is an (individual-level) indicator for watching any of the channel.

	Vote Intention - IV		**Vote Intention - OLS**	
Regressor	Real	Simulated	Real	Simulated
FOX Predicted Hours	0.2183	0.0350		
CNN pos	0.0000	0.0002		
MSN pos	-0.0001	0.0000		
CNN Most-Watched			-0.0911	-0.0581
FOX Most-Watched			0.3073	0.2840
MSN Most-Watched			-0.0970	-0.0164
FOX Only	-0.0711	-0.0133	-0.0218	0.0082
MSN Only	-0.0011	0.0003	0.0162	0.0082
Both Available	-0.0526	-0.0139	-0.0070	0.0141
Number of Channels	-0.0006	0.0001	-0.0007	0.0000
Number of Broadcast Channels	0.0006	0.0000	-0.0004	0.0001
Age Quintile 2	-0.0113	0.0760	0.0467	0.0805
Age Quintile 3	-0.0509	0.0896	0.0658	0.0807
Age Quintile 4	-0.1126	-0.0412	0.0137	-0.0249
Age Quintile 5	-0.2079	0.0093	0.0310	0.0465
Income	0.3068	0.5505	0.4240	0.4398
Income^2	-0.2904	-0.1240	-0.3039	-0.1127
Income^3	0.0802	0.0090	0.0705	0.0089
White	0.0434	0.1111	0.0899	0.1148
Black	-0.3670	-0.2807	-0.2920	-0.2662
Hispanic	-0.0266	-0.0783	-0.0857	-0.0794
College Graduate	-0.0515	-0.0946	-0.0508	-0.0752
Man	0.0357	0.0529	0.0427	0.0459
1996 County R Share	0.4777	0.0253	0.4901	0.0229

Table 55: Comparison of regression coefficients in real data and simulations. Dependent variable is individual-level Republican vote intention.

	Vote Intention - IV		Vote Intention - OLS	
Regressor	Real	Simulated	Real	Simulated
FOX Predicted Hours	0.0801	0.0843		
CNN position	-0.0001	0.0005		
MSN position	-0.0001	0.0001		
CNN Hours			-0.0014	-0.0078
FOX Hours			0.0026	0.0133
MSN Hours			-0.0038	-0.0086
FOX Only	-0.0018	-0.0052	0.0249	0.0527
MSN Only	-0.0114	0.0043	0.0093	-0.0026
Both Available	-0.0071	-0.0130	0.0119	0.0504
Number of Channels	-0.0001	0.0001	-0.0002	0.0000
Number of Broadcast Channels	0.0011	-0.0002	0.0005	0.0004
Nielsen Diary Market	0.0100	0.0030	-0.0002	-0.0005
Log Population Density	-0.0078	0.0015	-0.0075	0.0011
Percent Black	-0.4703	-0.3132	-0.5059	-0.3295
Percent Asian	0.0006	-0.1118	-0.0385	-0.0993
Percent Other	-0.2533	-0.1338	-0.1858	-0.1314
Percent Hispanic	-0.1663	-0.0883	-0.1990	-0.0860
Percent Male	0.1532	0.1566	0.3317	0.1950
Percent Age 10-20	-0.0861	-0.0900	-0.1390	-0.1604
Percent Age 20-30	-0.4244	-0.2717	-0.5032	-0.2925
Percent Age 30-40	-0.4554	-0.2419	-0.6427	-0.3631
Percent Age 40-50	-0.0785	-0.0744	-0.2646	-0.1007
Percent Age 50-60	-0.5215	-0.1056	-0.6132	-0.1291
Percent Age 60-70	-0.8291	-0.1328	-0.6670	-0.2469
Percent Age 70-80	-0.1380	-0.3452	0.3275	-0.1205
Percent Age 80+	-0.2075	-0.1777	-0.3886	-0.2592
Income Decile 2	0.0268	0.0194	0.0342	0.0132
Income Decile 3	0.0379	0.0334	0.0446	0.0229
Income Decile 4	0.0392	0.0397	0.0504	0.0308
Income Decile 5	0.0450	0.0471	0.0537	0.0404
Income Decile 6	0.0505	0.0561	0.0559	0.0438
Income Decile 7	0.0597	0.0670	0.0708	0.0579
Income Decile 8	0.0689	0.0790	0.0825	0.0707
Income Decile 9	0.0806	0.1129	0.0945	0.0974
Income Decile 10	0.1043	0.1533	0.1132	0.1356
Percent HS Grad	-0.0710	-0.0071	-0.0563	0.0662
Percent Some College	-0.0673	0.0042	0.0184	0.0331
Percent Bachelors'	-0.1591	0.0286	-0.0438	0.0349
Percent Post-Grad	-0.4319	0.0669	-0.4292	0.1130
Percent Suburban	-0.0098	0.0237	0.0108	0.0056
Percent Urban	-0.0225	0.0146	-0.0113	0.0014
1996 County R Share	0.4627	0.0347	0.4721	0.0355

Table 56: Comparison of regression coefficients in real data and simulations. Dependent variable is individual-level Republican vote intention.