

Bias in Cable News: Real Effects and Polarization **(under revision)**

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EARIE
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Research Questions

- What are the **persuasive effects** of slanted cable news (Fox News and MSNBC) on partisan voting?
- How important are **tastes for like-minded** cable news?
- Can these two forces interact to generate polarization?
- Implications for media mergers?

The Approach

- Estimate model of
 - allocating time to watching news channels,
 - Influence of exposure on ideology, and
 - voting in Presidential elections 2000, 2004, and 2008.
- **Use channel positions in cable lineup as instrumental variables to estimate “persuasive” effect.**
 - **Cable channel positions do not predict viewership by satellite subscribers in the same zip code.**

Some context. Why care?



MSNBC



FOX News

- Fox News averaging 2-3 million viewers per night. Cumulative reach estimated over 50 million individuals.
- MSNBC and CNN are between 500,000 and 1 million viewers per night.
- Even a small amount of persuasion can have effects with these levels of reach.

Some context. Why care?

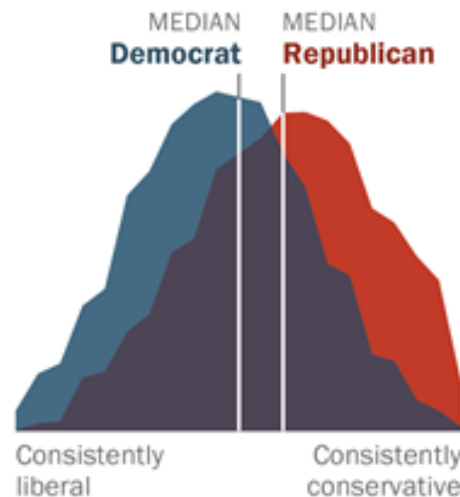
- Does the media sector need special regulation?
 - Example of a policy: Comcast/NBC-U merger. Placement of Bloomberg on Comcast systems.
- Implications for endogenous product positioning.
- Increased polarization in US politics.
- Caveats:
 - Multiple media for news, changing technology.
 - First amendment issues.
 - Existing evidence (Gentzkow and Shapiro 2010,2011) suggests echo chambers and manipulation by partisan owners are not important.

Democrats and Republicans More Ideologically Divided than in the Past

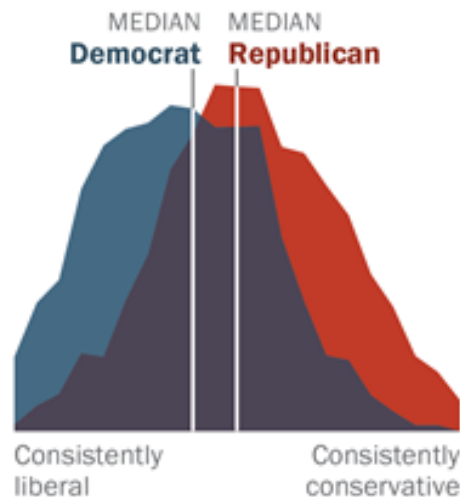
Democrats and Republicans More Ideologically Divided than in the Past

Distribution of Democrats and Republicans on a 10-item scale of political values

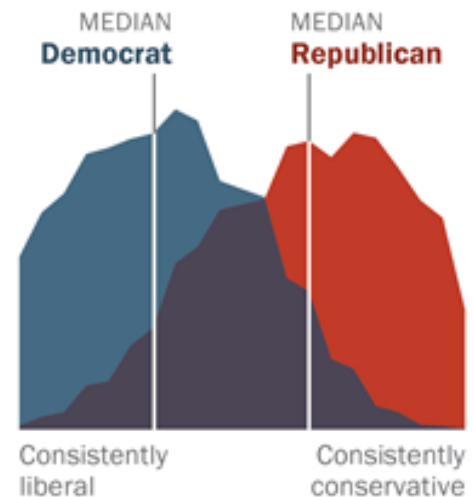
1994



2004



2014



Source: 2014 Political Polarization in the American Public

Notes: Ideological consistency based on a scale of 10 political values questions (see Appendix A). The blue area in this chart represents the ideological distribution of Democrats; the red area of Republicans. The overlap of these two distributions is shaded purple. Republicans include Republican-leaning independents; Democrats include Democratic-leaning independents (see Appendix B).

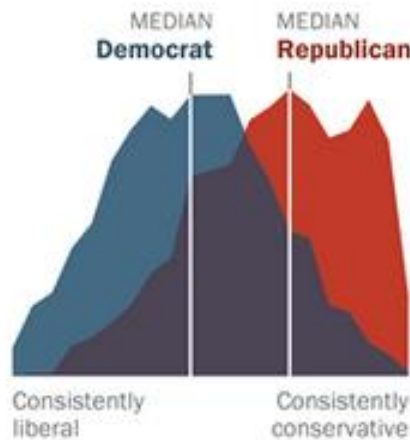
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Polarization Surges Among the Politically Engaged

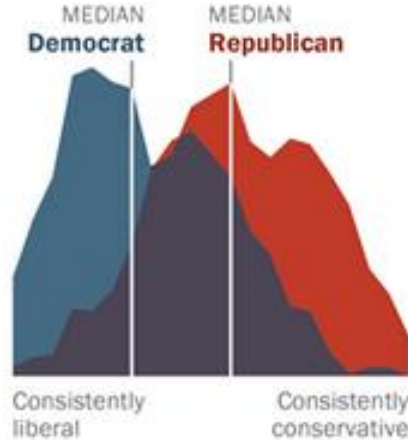
Distribution of Democrats and Republicans on a 10-item scale of political values, by level of political engagement

Among the politically engaged

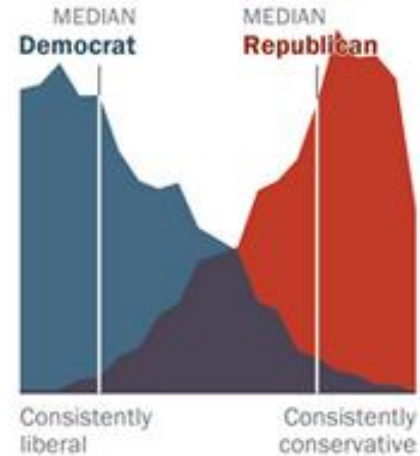
1994



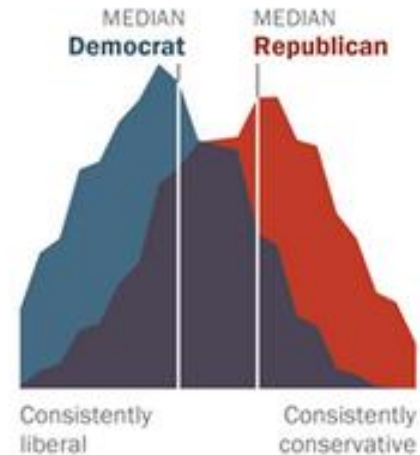
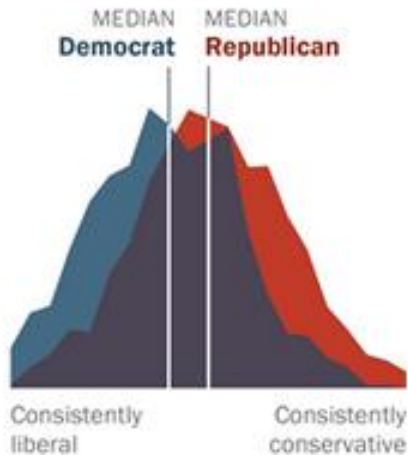
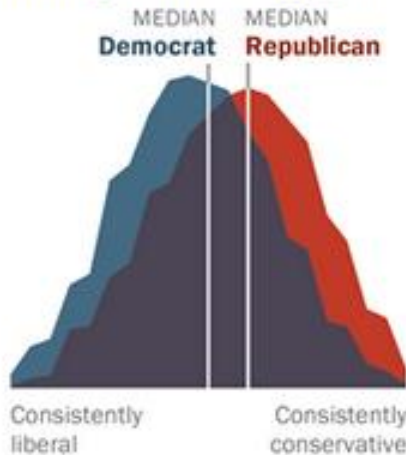
2004



2014



Among the less engaged

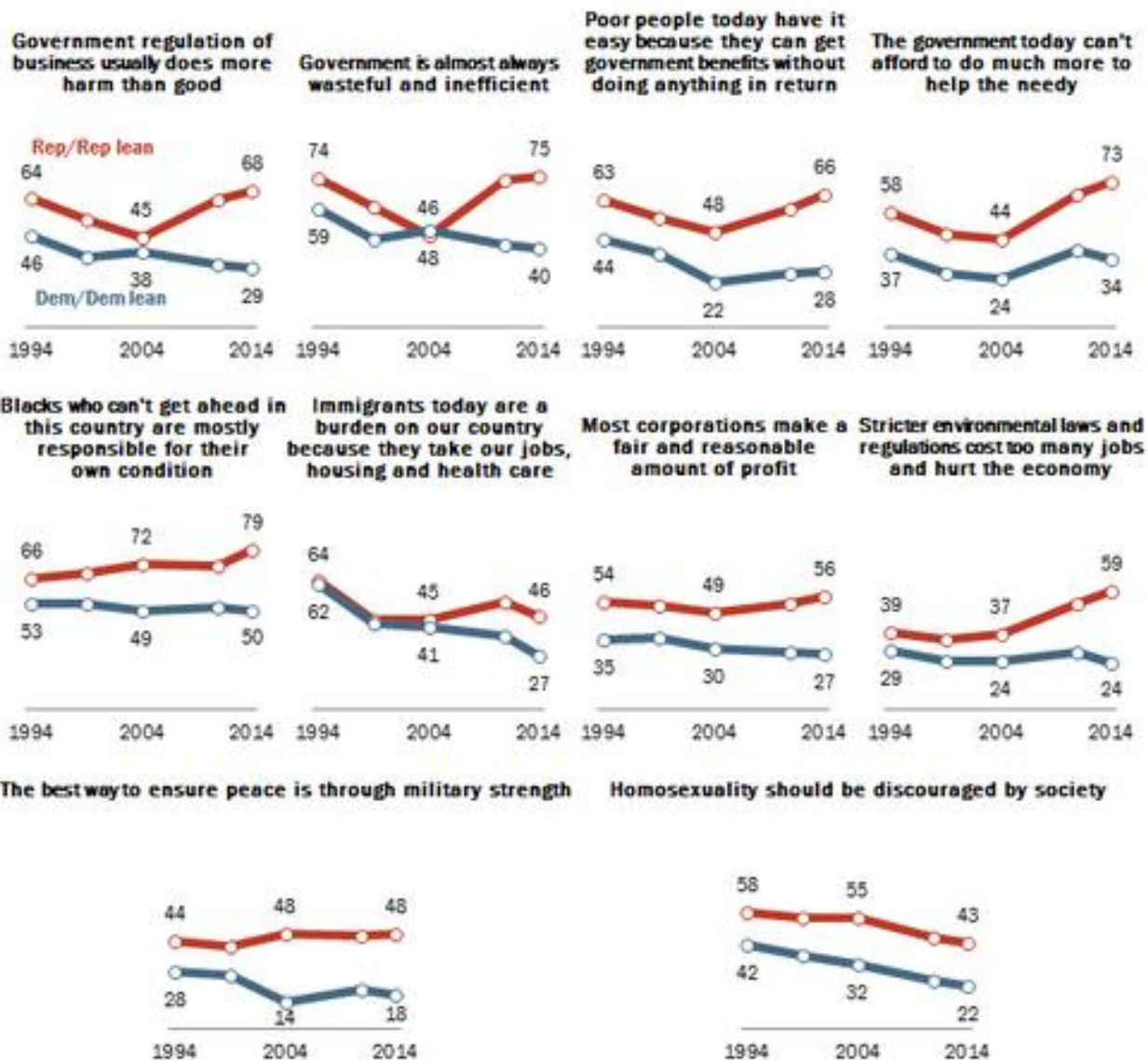


Source: 2014 Political Polarization in the American Public

Notes: Ideological consistency based on a scale of 10 political values questions (see Appendix A). Republicans include Republican-leaning independents; Democrats include Democratic-leaning independents (see Appendix B). Politically engaged are defined as those who are registered to vote, follow government and public affairs most of the time and say they vote always or nearly always.

Growing Gaps between Republicans and Democrats

% who take the *more conservative* position on each question in the ideological consistency scale



Source: 2014 Political Polarization in the American Public

Line charts show the survey questions included in the 10-item ideological consistency scale. Questions are forced-choice questions with two options; only the conservative responses are shown here. See topline for the full question wording and trends for each question.

Summary of Results

- Large effect of Fox News on partisan voting.
 - Predict aggregate election effects around 1-2%
- Moderate taste for like-minded news.
- Cable news can polarize individuals over an election cycle.

Contribution and Prior Literature

- Introduce **new research design (channel positions)** to estimate effects.
- Find quantitatively large effects.
 - Dellavigna and Kaplan (2007) based on roll-out.
 - Measurement issues. (Appendix A)
 - Deal with satellite
- We find significant Fox News effect.
- Gentzkow and Shapiro (2010)
 - Embed persuasive effect into similar demand model. Add estimation of “influence” parameter.
 - Possibility of feedback loop.
 - Useful for correcting for selection into satellite.
 - Useful for quantifying and dealing with heterogeneity.
 - Find channels are differentiating in slant more over time.

Quick Outline

1. Data including ideology estimates
2. 2SLS estimates for voting Republican against hours of Fox News
3. Model
4. Parameter estimates and empirical identification
5. Polarization dynamics

Data

- Channel Lineups (Nielsen FOCUS)
 - Position by channel by zip code by year.
- Viewership: Zip code level viewership data (Nielsen)
 - Zip code
 - Average hours per week from sample for cable and satellite separately
 - N = 100k/year for 2005-2008
- Viewership: Individual level viewership data (Simmons and Mediamark)
 - Zip code.
 - Hours of channels watched per week.
 - Demographics.
 - Cable or satellite subscription.
 - N = 25k/year 2000-2008
- Voting: NAES and CCES surveys.
 - Zip code.
 - Demographics.
 - Intent to vote in Presidential elections 2000, 2004, 2008 (repeated cross sections).
 - Most watched cable news channel.
- Broadcast transcripts of CNN, Fox News, MSNBC
- The Congressional Record

Positioning

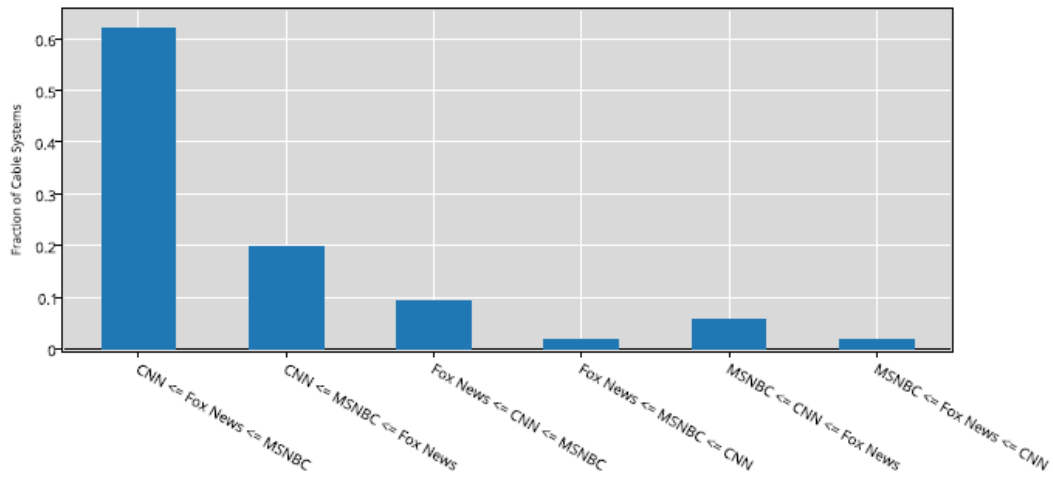
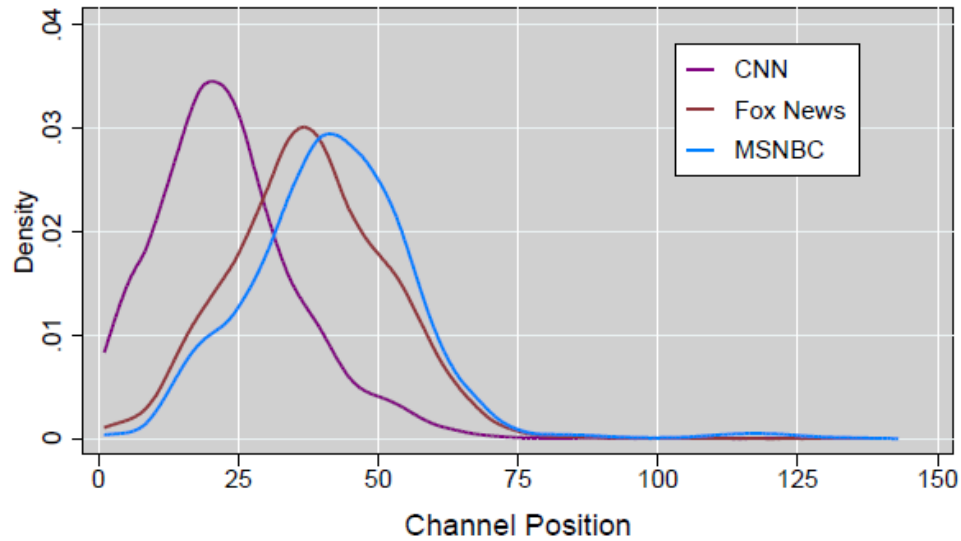
OR36575	COMCAST CABLE-E PORTLAND	<i>Location:</i>	PORTLAND		
		<i>Franchise Date:</i>	01/1982		
<i>DMM:</i>	PORTLAND, OR	<i>Total Subs:</i>	130,036	(03/2010)	
<i>NTT Territory:</i>	PACIFIC	<i>Digital Subs:</i>	N/A	(03/2010)	
		<i>Digital Capable:</i>	Y	(03/2010)	
<i>Video Operator:</i>	COMCAST CORPORATION	<i>Channel Capacity:</i>	994		

NC32440	CHARTER-OUTERBANKS	<i>Location:</i>	MANTEO		
		<i>Franchise Date:</i>	05/1974		
<i>DMM:</i>	NORFOLK-PORTSMTH-NEWPT NWS	<i>Total Subs:</i>	25,400	(02/2010)	
<i>NTT Territory:</i>	SOUTH	<i>Digital Subs:</i>	N/A	(07/2010)	
		<i>Digital Capable:</i>	Y	(07/2010)	
<i>Video Operator:</i>	CHARTER COMMUNICATIONS	<i>Channel Capacity:</i>	965		

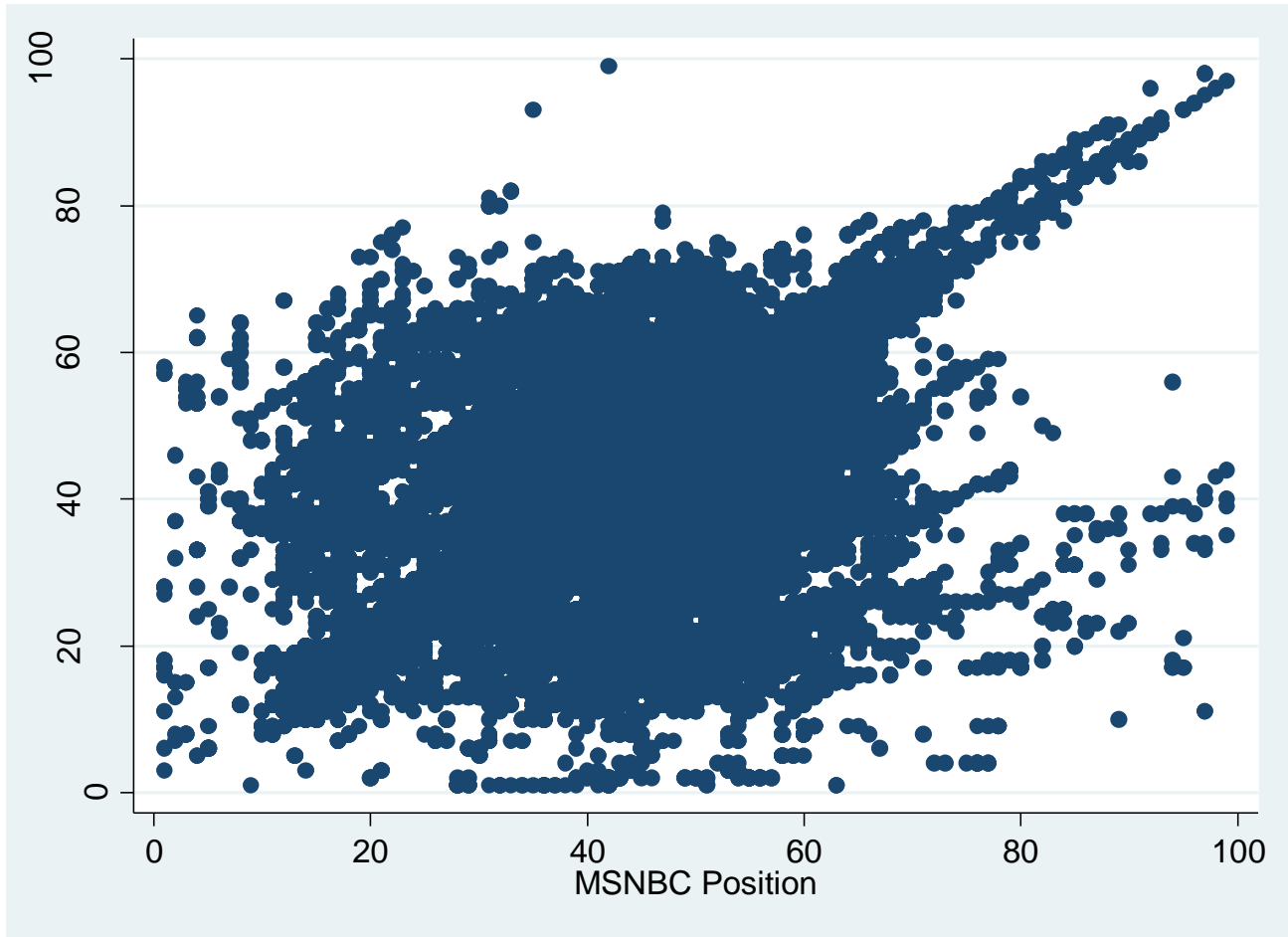
CNN	CABLE NEWS NETWORK		00044	Y	N	Y	01	TIER 01		
HLN	HLN		00045	Y	N	Y	01	TIER 01		
CNBC	CNBC		00046	Y	N	Y	01	TIER 01		
TWC	THE WEATHER CHANNEL		00047	Y	N	Y	01	TIER 01		
FXNC	FOX NEWS CHANNEL		00048	Y	N	Y	01	TIER 01		
NWCN	NORTHWEST CABLE NEWS		00049	Y	N	N	01	TIER 01		
HIST	HISTORY		00050	Y	N	Y	01	TIER 01		
TRU	TRUTV		00051	Y	N	Y	01	TIER 01		
AEN	A & E NETWORK		00052	Y	N	Y	01	TIER 01		
FX	FX		00053	Y	N	Y	01	TIER 01		
TNT	TURNER NETWORK TELEVISIO		00054	Y	N	Y	01	TIER 01		
TBSC	TBS NETWORK		00055	Y	N	Y	01	TIER 01		
BET	BLACK ENTERTAINMENT TV		00056	Y	N	Y	01	TIER 01		
SPK	SPIKE TV		00057	Y	N	Y	01	TIER 01		
USA	USA NETWORK		00058	Y	N	Y	01	TIER 01		
SYFY	SYFY		00059	Y	N	Y	01	TIER 01		
COMDY	COMEDY CENTRAL		00060	Y	N	Y	01	TIER 01		
CMT	CMT		00061	Y	N	Y	01	TIER 01		
VH1	VH1		00062	Y	N	Y	01	TIER 01		
MTV	MTV: MUSIC TELEVISION		00063	Y	N	Y	01	TIER 01		
TVL	TV LAND		00064	Y	N	Y	01	TIER 01		
TRAV	TRAVEL CHANNEL		00065	Y	N	Y	01	TIER 01		
FOOD	FOOD NETWORK		00066	Y	N	Y	01	TIER 01		
HGTV	HOME & GARDEN TV NET		00067	Y	N	Y	01	TIER 01		
OXYG	OXYGEN MEDIA		00068	Y	N	Y	01	TIER 01		
LIF	LIFETIME TELEVISION		00069	Y	N	Y	01	TIER 01		
ENT	E! ENTERTAINMENT TV		00070	Y	N	Y	01	TIER 01		
AMC	AMC		00071	Y	N	Y	01	TIER 01		
KOPB	KOPB-PORTLAND,OR	P	10	00075	Y	N	N	01	TIER 01	
JWTV	JEWELRY TV		00098	Y	N	N	BB	BASIC		
LOV	LOCAL ORIGINATION - VIDE		00099	Y	N	N	BB	BASIC		
CSP3	C-SPAN3		00106	Y	N	N	01	TIER 01		
CRNT	CURRENT TV		00107	Y	N	N	02	ALL OTHER TIERS		
SPRT	SPROUT		00119	Y	N	N	01	TIER 01		
NKJR	NICK JR		00120	Y	N	N	02	ALL OTHER TIERS		
HUB	THE HUB		00121	Y	N	N	01	TIER 01		
DXD	DISNEY XD		00122	Y	N	N	02	ALL OTHER TIERS		
NIKT	NICK TOO		00124	Y	N	N	01	TIER 01		
NIKT	NICK TOO		00124	Y	N	N	02	ALL OTHER TIERS		
NKT	NICKTOONS		00126	Y	N	N	02	ALL OTHER TIERS		
WSCN	WEATHERSCAN		00127	Y	N	N	02	ALL OTHER TIERS		
MNBC	MSNBC		00128	Y	N	Y	01	TIER 01		
BTV	BLOOMBERG TV		00129	Y	N	N	01	TIER 01		

WNCT	WNCT:GREENVILLE,NC	C	10	00009	Y	N	N	BB	BASIC		
WAVY	WAVY:PORTSMOUTH,VA	N	31	00010	Y	N	N	BB	BASIC		
CHN	CABLE NEWS NETWORK			00011	Y	N	Y	BB	BASIC		
LOV	LOCAL ORIGINATION - VIDE			00012	Y	N	N	BB	BASIC		
WVEC	WVEC:HAMPTON,VA	A	13	00013	Y	N	N	BB	BASIC		
QVC	QUALITY VALUE CONVENIENC			00014	Y	N	N	BB	BASIC		
NAN	NICK AT NITE			00015	Y	N	Y	BB	BASIC		
NICK	NICKELODEON			00015	Y	N	Y	BB	BASIC		
TWC	THE WEATHER CHANNEL			00016	Y	N	Y	BB	BASIC		
DISC	DISCOVERY CHANNEL			00017	Y	N	Y	BB	BASIC		
AEN	A & E NETWORK			00018	Y	N	Y	BB	BASIC		
EDAC	EDUCATIONAL ACCESS			00019	Y	N	N	BB	BASIC		
LOV	LOCAL ORIGINATION - VIDE			00020	Y	N	N	BB	BASIC		
COMDY	COMEDY CENTRAL			00021	Y	N	Y	BB	BASIC		
USA	USA NETWORK			00022	Y	N	Y	BB	BASIC		
LIF	LIFETIME TELEVISION			00023	Y	N	Y	01	TIER 01		
MNBC	MSNBC			00024	Y	N	Y	01	TIER 01		
ESPN	ESPN			00025	Y	N	Y	01	TIER 01		
ESP2	ESPN2			00026	Y	N	Y	01	TIER 01		
TNT	TURNER NETWORK TELEVISIO			00027	Y	N	Y	01	TIER 01		
TRAV	TRAVEL CHANNEL			00028	Y	N	Y	01	TIER 01		
TBSC	TBS NETWORK			00029	Y	N	Y	01	TIER 01		
FAM	ABC FAMILY			00030	Y	N	N	01	TIER 01		
HIST	HISTORY			00031	Y	N	Y	01	TIER 01		
FSSO	FOX SPORTS SOUTH			00032	Y	N	N	01	TIER 01		
SYFY	SYFY			00033	Y	N	Y	01	TIER 01		
DSNY	DISNEY CHANNEL			00034	Y	N	N	01	TIER 01		
ADSM	ADULT SWIM			00035	Y	N	Y	01	TIER 01		
TOON	THE CARTOON NETWORK			00035	Y	N	Y	01	TIER 01		
ENT	E! ENTERTAINMENT TV			00037	Y	N	Y	01	TIER 01		
HGTV	HOME & GARDEN TV NET			00038	Y	N	Y	01	TIER 01		
TLC	TLC			00039	Y	N	Y	01	TIER 01		
FXNC	FOX NEWS CHANNEL			00040	Y	N	Y	01	TIER 01		
VS	VERSUS			00041	Y	N	Y	01	TIER 01		

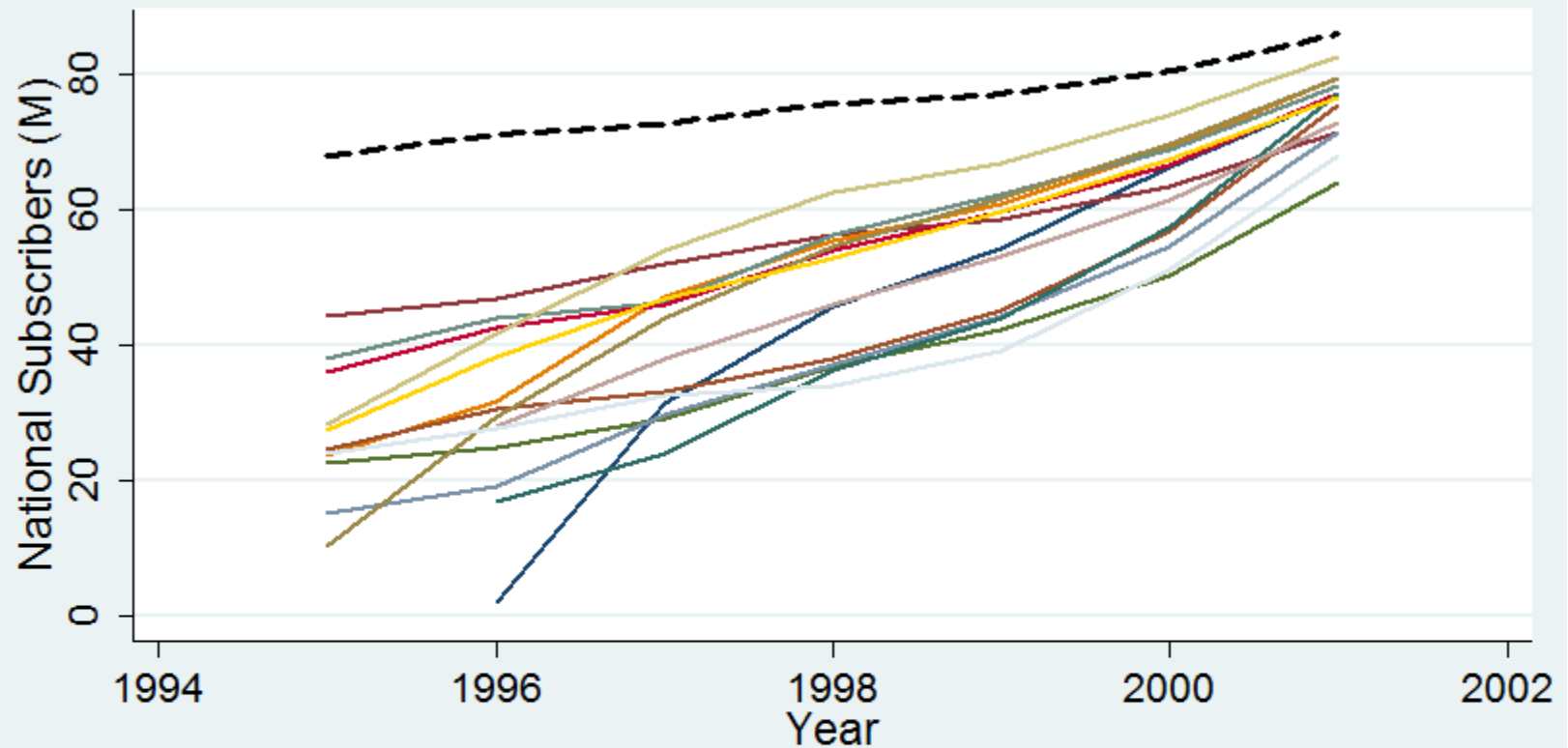
Positioning



Positioning



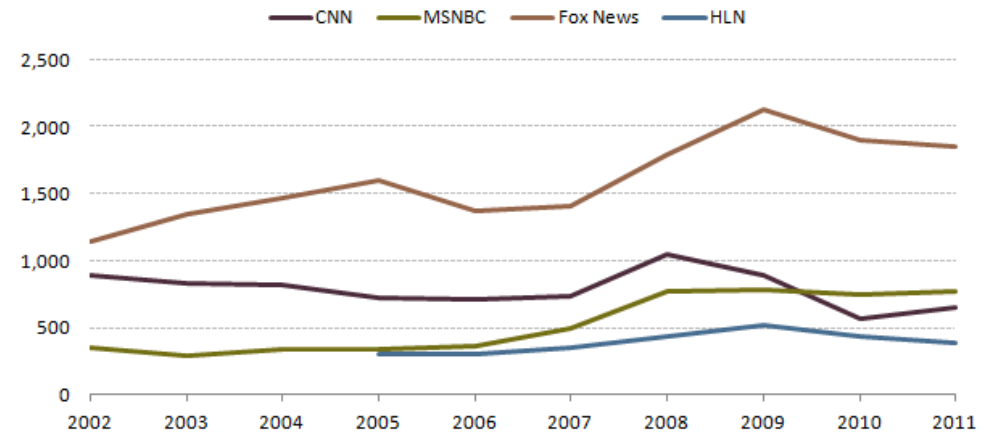
Cable TV: 1994-2001



Viewership

Mean Hours per Week			
	CNN	Fox News	MSNBC
2000	1.02	0.52	0.40
2001	1.41	0.80	0.52
2002	1.40	1.02	0.46
2003	1.19	1.07	0.54
2004	1.22	1.26	0.55
2005	1.25	1.28	0.60
2006	1.14	1.18	0.54
2007	1.16	1.22	0.56
2008	1.20	1.52	0.67
Total	1.22	1.07	0.53

Cable News Media Prime-Time Viewership, in Thousands



Source: Nielsen Media Research, used under license

Note: HLN viewership is shown starting in 2005, the year its programming was reconfigured to reflect the formula of other cable news channels

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2012 STATE OF THE NEWS MEDIA

Individual level survey (N = ~ 136,000)

Median hours watched is 0 for all channels.

Most viewers watch only one cable news channel, if positive. (Our data represent weekly recall.)

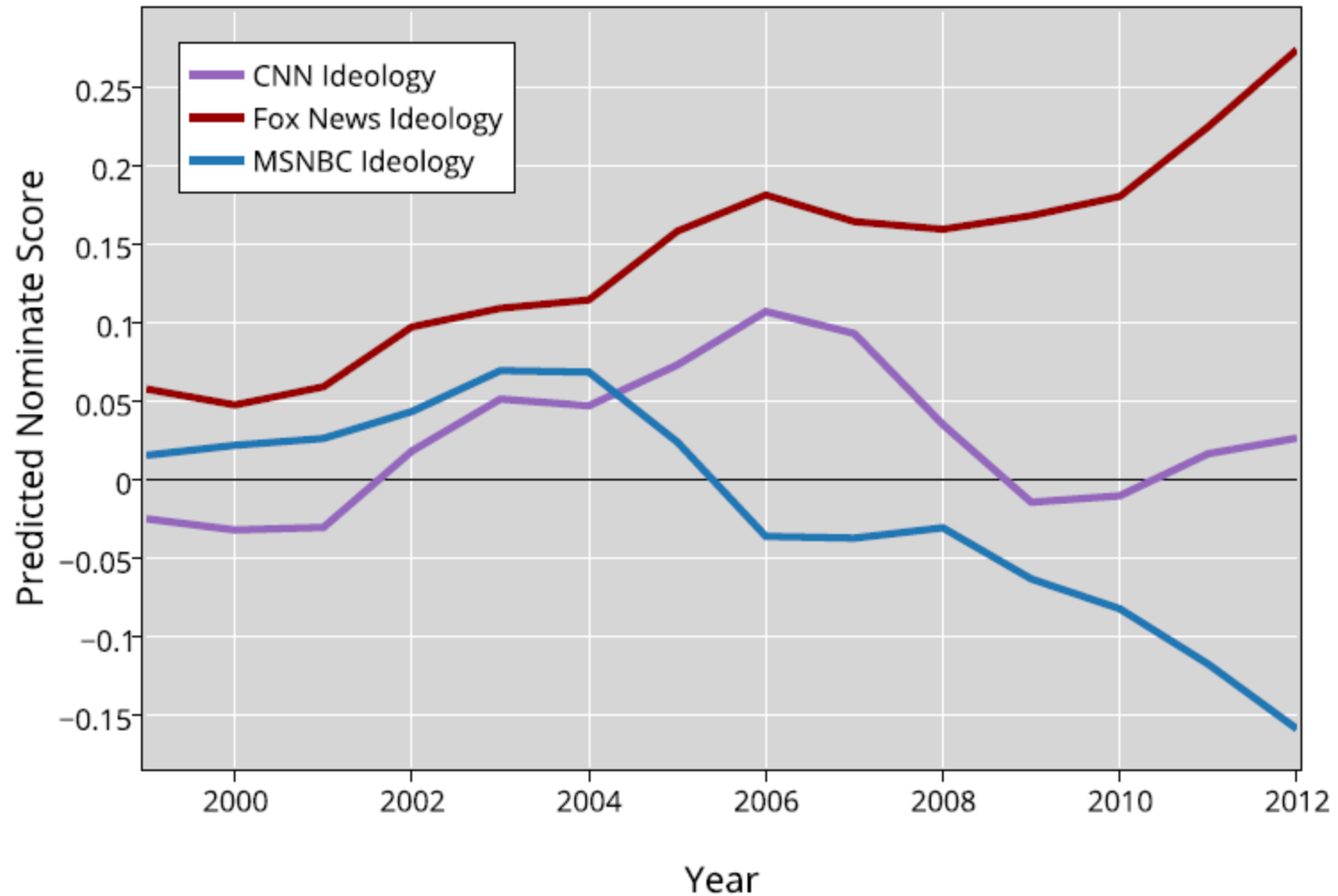
Transcripts and Channel Ideology

- We want to assign a scalar ideology to each channel-year.
- Follow previous literature (eg Gentzkow and Shapiro (2010)) in using language that channels employ, and comparing to language employed by agents with a measured ideology-Congress-people.
- Each Congressperson has an estimated Nominat score between -1 and 1.

Transcripts and Channel Ideology

- Count frequency of two-word phrase usage by Congress person separately by year.
- Would like to regress ideology on phrase usage, but many more phrases than Congress people.
- Variable selection via LASSO/Elastic Net regression of Nominat score on phrase usage, separately by year.
- Plug in phrase usage by cable news channels.
- Remove mean for each year.
- Moving average smoothing +/- one year.

Transcripts and Channel Ideology



2.5% Most Indicative Phrases by Year

2000		2002		2004	
"benefit wealthiest"	-3.55	"clean forest"	3.53	"administr refus"	-3.78
"break wealthi"	-3.08	"democrat friend"	2.71	"administr republican"	-3.15
"break wealthiest"	-4.53	"environment standard"	-3.40	"compani hmo"	-3.90
"busi come"	3.14	"forc labor"	-3.83	"cost energi"	3.16
"caught nap"	3.60	"laid worker"	-4.89	"fall far"	-6.86
"child tax"	4.84	"lock box"	-2.72	"far short"	-3.33
"continu everi"	-4.68	"polit correct"	4.98	"hold line"	3.48
"cut wealthi"	-3.22	"reagan said"	4.25	"job administr"	-4.20
"cut wealthiest"	-4.20	"renounc citizenship"	-4.26	"liabil cost"	3.06
"feder bureaucraci"	5.87	"sexual orient"	-3.17	"major want"	-3.88
"largest tax"	3.28	"social justic"	-2.68	"marriag will"	3.33
"live poverti"	-3.89	"trillion surplu"	-2.89	"protect tradit"	2.89
"pm today"	5.22	"us later"	-2.86	"revenu feder"	3.37
"tax hike"	4.10	"wealthiest american"	-2.59	"trillion surplu"	-3.03
"wealthiest american"	-3.24			"univers health"	-4.17
2006		2008		2010	
"billion cut"	-2.67	"11 countri"	3.84	"bigger govern"	2.90
"billion week"	-4.08	"bush took"	-3.53	"constitut sai"	3.42
"cut wealthiest"	-3.51	"call abort"	2.92	"creat govern"	2.99
"flag burn"	-2.65	"democrat bill"	3.21	"democrat control"	3.20
"iraq polici"	-2.85	"entitl reform"	3.37	"employ mandat"	3.20
"keep tax"	4.39	"new nuclear"	3.45	"govern bureaucrat"	3.26
"largest cut"	-3.43	"new refineri"	3.17	"govern mandat"	3.12
"ms 13"	3.40	"plan bring"	3.30	"grow govern"	3.02
"presidenti power"	-3.19	"properti without"	4.76	"louisiana mr"	3.01
"protect tradit"	3.04	"soon on"	4.44	"mandat tax"	3.36
"republican friend"	-2.79	"sue opec"	4.73	"new mandat"	4.24
"war cost"	-2.72	"tax burden"	2.89	"obamacar pass"	3.02
"wiretap american"	-2.81	"thing common"	2.97	"print monei"	3.02
"year bush"	-4.04	"without due"	2.80	"sixth economi"	4.12
"yet republican"	-4.26	"yet today"	4.91	"spend borrow"	2.90
				"spend control"	3.07

2SLS – IV Analysis – First Stage

- First Stage:
 - LHS: Hours watched of FNC
 - RHS are year effects, demographics (individual and zip code), and channel positions.

$$h_{it}^c = \delta_{ct} + a_{it} + \alpha_c x_{it} + \zeta_{c,FNC} P_{it}^{FNC} + \zeta_{c,MSNBC} P_{it}^{MSNBC} + \epsilon_{ict}^H$$

- Zip code level Nielsen viewership (2005 to 2008) and precinct level voting for 2008
- Individual level survey viewership (2000 to 2008) and survey intent to vote for 2000, 2004, and 2008

2SLS – IV Analysis – Second Stage

- Second Stage:
 - LHS: Voting for Republican (Zip code 2008 total and Individual survey intent)
 - RHS: Fox Hours, Demographics (individual and zip code)

$$y_{it} = \gamma_t + a_{it} + \beta x_{it} + \rho_f h_{it}^f + \epsilon_{it}^V$$

- Individual level is two-sample:
 - First stage run on viewership data set.
 - Second stage and OLS run on NAES/CCES individual voting survey data.
- Zip code level is single sample.
- Extensive demographics condition on: zip code level race, gender, income, age, house prices, food stamps, veteran status, family status, **fraction of donations going in 1996 to Republicans**, and county level religious adherence.

First Stage: Viewing and Positions

Table 1: First Stage Regressions: Nielsen Data

	FNC Hours Per Week					
	(1)	(2)	(3)	(4)	(5)	(6)
FNC Cable Position	-0.003*** (0.001)	-0.002*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.002 (0.001)	-0.003*** (0.0004)
MSNBC Cable Position	0.001** (0.001)	0.001** (0.001)	0.001*** (0.001)	0.001** (0.0005)	0.001 (0.001)	0.001*** (0.0004)
System has MSNBC Only	0.078 (0.093)	0.068 (0.090)	0.054 (0.089)	0.026 (0.121)	0.029 (0.182)	0.027 (0.086)
System has FNC Only	0.458*** (0.042)	0.428*** (0.041)	0.381*** (0.038)	0.405*** (0.044)	0.248*** (0.055)	0.349*** (0.033)
System has Both	0.369*** (0.047)	0.364*** (0.047)	0.296*** (0.042)	0.308*** (0.048)	0.196*** (0.072)	0.232*** (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	24.4	29.1	2.6	35.9
Number of Clusters	5826	5826	5816	4855	4857	4768
N	73,488	73,488	73,317	61,278	61,288	52,155

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

Notes: Cluster-robust standard errors in parentheses (clustered by cable system). Instrument is the ordinal

Table 2: First Stage Regressions: Mediamark / Simmons Data

	FNC Hours per Week					
	(1)	(2)	(3)	(4)	(5)	(6)
FNC Cable Position	-0.001 (0.001)	-0.002* (0.001)	-0.002** (0.001)	-0.002** (0.001)	0.0002 (0.001)	0.0005 (0.001)
MSNBC Cable Position	0.001 (0.001)	0.001 (0.001)	0.0004 (0.001)	0.001 (0.001)	-0.0005 (0.001)	-0.0002 (0.001)
HH Income			0.726*** (0.050)	0.658*** (0.049)	0.673*** (0.051)	0.611*** (0.051)
HH Income ²			-0.312*** (0.027)	-0.279*** (0.027)	-0.286*** (0.028)	-0.259*** (0.027)
HH Income ³			0.033*** (0.003)	0.029*** (0.003)	0.030*** (0.003)	0.027*** (0.003)
Age Quintile 2			0.183*** (0.016)	0.176*** (0.017)	0.177*** (0.016)	0.174*** (0.017)
Age Quintile 3			0.364*** (0.017)	0.350*** (0.018)	0.353*** (0.018)	0.347*** (0.019)
Age Quintile 4			0.525*** (0.019)	0.510*** (0.020)	0.516*** (0.020)	0.508*** (0.021)
Age Quintile 5			1.071*** (0.025)	1.041*** (0.025)	1.047*** (0.025)	1.024*** (0.025)
White			0.187*** (0.019)	0.163*** (0.021)	0.185*** (0.020)	0.180*** (0.021)
Black			0.150*** (0.031)	0.181*** (0.029)	0.200*** (0.029)	0.219*** (0.029)
Hispanic			-0.189*** (0.025)	-0.143*** (0.022)	-0.166*** (0.023)	-0.141*** (0.023)
College Degree			-0.128*** (0.016)	-0.103*** (0.016)	-0.112*** (0.016)	-0.107*** (0.017)
Man			0.176*** (0.013)	0.175*** (0.014)	0.177*** (0.014)	0.179*** (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	6.1	0.1	0.4
Number of Clusters	2589	2589	2589	2380	2589	2381
N	207,950	207,950	207,860	198,241	207,860	198,300

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

Cluster-robust standard errors in parentheses (clustered by cable system). Instrument is the ordinal position

Probing the Instrument

- Test 1: Does cable channel position predict viewership of satellite viewers?
 - These viewers look like cable viewers on observables, but don't interface with cable positions on their TV (satellite has national channel position).
- Test 2: How does effect of position change as we add/drop observables which correlate strongly with voting Republican?

Cable-Satellite Observable Corr's

Characteristic	N>0	N>10	N>50	N>100	IV
Black	0.581*** (0.0129)	0.708*** (0.0148)	0.783*** (0.0279)	0.912*** (0.0571)	0.996*** (0.0388)
College	0.398*** (0.0165)	0.540*** (0.0202)	0.705*** (0.0412)	0.716*** (0.0714)	0.917*** (0.0779)
HH Income	0.498*** (0.0144)	0.612*** (0.0166)	0.820*** (0.0309)	0.886*** (0.0607)	0.973*** (0.0637)
Age	0.261*** (0.0165)	0.358*** (0.0212)	0.395*** (0.0458)	0.490*** (0.0764)	0.791*** (0.0998)
Hispanic	0.538*** (0.0138)	0.665*** (0.0159)	0.778*** (0.0234)	0.843*** (0.0345)	0.838*** (0.0304)
Party ID R	0.105*** (0.0286)	0.289*** (0.0503)	0.629*** (0.106)	0.888*** (0.172)	1.552*** (0.437)
Party ID D	0.118*** (0.0282)	0.228*** (0.0506)	0.630*** (0.117)	1.174*** (0.211)	2.947* (1.690)

The Satellite Placebo

Table 8: First Stage Regressions: Satellite and Cable Subscribers

	FNC Hours per Week					
	(1)	(2)	(3)	(4)	(5)	(6)
Satellite	0.395*** (0.042)	0.443*** (0.041)	0.440*** (0.051)	0.853*** (0.092)	0.835*** (0.091)	0.756*** (0.099)
FNC Cable Position \times cable	-0.004*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)	-0.003** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)
FNC Cable Position \times sat	-0.002* (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	0.0003 (0.001)	0.0004 (0.001)	0.001 (0.001)
MSNBC Cable Position \times cable	0.003*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
MSNBC Cable Position \times sat	-0.00002 (0.001)	-0.0001 (0.001)	0.00005 (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	0.009	0.049	0.032	0.016
Number of Clusters	5826	5816	4855	2589	2589	2380
N	257,289	256,868	218,160	207,950	207,860	198,241

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

Cluster-robust standard errors in parentheses (clustered by cable system). Columns 1-3 use the zipcode level

The Satellite Placebo

- Placebo would be misleading if satellite subscribers' political ideology were uncorrelated with cable subscribers'.
- Cable and satellite subscribers' observable demographics are strongly positively correlated.
- Though we can comfortably rule out that the own-position coefficients are equal between cable and satellite, the satellite estimates are not “precise zeroes” and in some cases slightly negative.

Targeting on Observables

Table 9: Comparison of covariate groups' influence on viewing equation, voting equation, and the first stage coefficient estimate: Nielsen Data.

	Viewing F-Stat	Voting F-Stat	First Stage	Reduced Form
Race	23.094	405.785	-0.003*** (0.001)	-0.0002** (0.0001)
Gender	53.259	111.943	-0.003*** (0.001)	-0.0003*** (0.0001)
Age	30.776	23.513	-0.003*** (0.001)	-0.0003*** (0.0001)
Income	1.729	7.643	-0.003*** (0.001)	-0.0003*** (0.0001)
Education	16.256	76.612	-0.003*** (0.001)	-0.0004*** (0.0001)
Real Estate	2.852	14.767	-0.003*** (0.001)	-0.0003*** (0.0001)
Government Assistance	0.172	25.388	-0.003*** (0.001)	-0.0003*** (0.0001)
Veterans	0.854	0.052	-0.003*** (0.001)	-0.0003*** (0.0001)
Marital Status	12.010	102.105	-0.003*** (0.001)	-0.0004*** (0.0001)
1996 Political Contribs.	11.373	186.508	-0.003*** (0.001)	-0.0002** (0.0001)
Religion	3.291	39.630	-0.003*** (0.001)	-0.0002** (0.0001)
(Complete set)	32.693	214.275	-0.003*** (0.001)	-0.0003*** (0.0001)
Number of Clusters	4855	4825	4855	4825
N	61,278	17,448	61,278	17,448

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

Cluster-robust standard errors in parentheses (clustered by cable system). The first two columns are F-

Targeting on Observables

- If local cable systems place Fox News in lower positions in more Republican areas, then as we add observables which correlate strongly with Republican, the estimated effect of position on viewing Fox News should decrease.
- Unlikely that systems target on un-observables but not on obvious observables.

Second Stage: Voting on Hours

Table 3: Second Stage Regressions: Precinct Voting Data

	2008 McCain Vote Share					
	(1)	(2)	(3)	(4)	(5)	(6)
Pred. Cable FNC Hrs.	0.084** (-0.001, 0.214)	0.106*** (0.034, 0.196)	0.079** (0.001, 0.188)	0.048** (0.004, 0.106)	0.061*** (0.019, 0.114)	0.041** (-0.0003, 0.090)
Satellite FNC Hrs.			-0.023* (-0.057, 0.001)			0.001*** (0.001, 0.002)
First Stage:	Pooled	Pooled	Pooled	Cable Only	Cable Only	Cable Only
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	Extended	Basic	Extended	Extended
Number of Clusters	6029	4825	4000	6029	4825	4000
N	22,509	17,448	12,441	22,509	17,448	12,441

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

Columns 1-3 use a first stage estimated using viewership data for all Nielsen TV households. Columns 4-6 estimate the first stage on 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.

- One SD of Fox News channel position changes viewership by about 3 minutes, implying 0.003-0.007 points change on voting.
- These coefficients represents average treatment effect on those induced into switching by the instrument.

Table 4: Second Stage Regressions: NAES / CCES Data

	P(Vote for Republican Presidential Candidate)					
	(1)	(2)	(3)	(4)	(5)	(6)
Pred. FNC Hrs.	0.110 (-0.982, 1.576)	0.203 (-0.183, 1.320)	0.167 (-0.003, 0.722)	0.052 (-0.104, 0.301)	0.096 (-0.024, 0.383)	0.082 (-0.003, 0.216)
HH Income		0.336 (-0.507, 0.628)	0.306 (-0.088, 0.432)		0.462 (0.379, 0.520)	0.401 (0.342, 0.459)
HH Income ²		-0.309 (-0.458, 0.055)	-0.269 (-0.351, -0.093)		-0.360 (-0.424, -0.290)	-0.307 (-0.371, -0.245)
HH Income ³		0.084 (0.046, 0.112)	0.073 (0.046, 0.092)		0.089 (0.070, 0.108)	0.077 (0.060, 0.096)
Age Quintile 2		-0.007 (-0.213, 0.061)	-0.006 (-0.115, 0.026)		0.006 (-0.064, 0.038)	0.003 (-0.026, 0.025)
Age Quintile 3		-0.043 (-0.460, 0.094)	-0.038 (-0.241, 0.022)		-0.013 (-0.143, 0.043)	-0.017 (-0.079, 0.024)
Age Quintile 4		-0.103 (-0.673, 0.099)	-0.091 (-0.395, -0.004)		-0.056 (-0.230, 0.020)	-0.056 (-0.139, -0.004)
Age Quintile 5		-0.189 (-1.368, 0.220)	-0.154 (-0.741, 0.023)		-0.087 (-0.428, 0.053)	-0.076 (-0.233, 0.026)
White		0.054 (-0.165, 0.134)	0.052 (-0.049, 0.082)		0.078 (0.032, 0.098)	0.069 (0.046, 0.084)
Black		-0.384 (-0.593, -0.314)	-0.360 (-0.476, -0.321)		-0.369 (-0.429, -0.341)	-0.345 (-0.381, -0.322)
Hispanic		-0.043 (-0.118, 0.172)	-0.054 (-0.085, 0.038)		-0.063 (-0.091, -0.008)	-0.064 (-0.084, -0.038)
College Degree		-0.058 (-0.108, 0.085)	-0.045 (-0.063, 0.014)		-0.071 (-0.089, -0.034)	-0.053 (-0.064, -0.038)
Man		0.039 (-0.154, 0.102)	0.046 (-0.057, 0.077)		0.051 (-0.017, 0.082)	0.055 (0.023, 0.075)
First Stage:	Pooled	Pooled	Pooled	Cable Only	Cable Only	Cable Only
Fixed Effects:	State-Year	State-Year	State-Year	State-Year	State-Year	State-Year
Cable Controls:	Y	Y	Y	Y	Y	Y
Demographics:	None	Individual	Extensive	None	Individual	Extensive
Number of Clusters	6659	6523	5541	6659	6523	5541
N	134,970	122,738	116,277	134,970	122,738	116,277

Columns 1-3 use a first stage estimated on all MediaMark/Simmons respondents. Columns 4-6 estimate the first stage on only those respondents 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. "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.

Model

- Three part demand analysis: cable/satellite subscription, time allocation, and voting.
 - Distribution of consumer-viewer-voters who differ on demographics (x), zip code/channel positions, ideology (r), and tastes for channels.
 - Ideology and tastes for channels are partly endogenous and inter-dependent.
- Timing within election cycle:
 1. Subscribe to cable, satellite, or neither
 2. Allocate time amongst news channels
 3. Ideology evolves
 4. Vote

Model (Voting)

- Every individual equally likely to be sampled.
- Each election has a cut-off ideology.
- Intend to vote for Republican candidate if voter's ideology greater than cut-off.
- Estimate initial ideology distribution from BLP with demographic interactions on county level vote shares from previous election.

Model (Viewing and Ideology Evolution)

- Given access to channels, solve time allocation problem:

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

$$\gamma_{it} = \chi_{it} \circ \nu_{it}$$

$$\chi_{ict} \sim \text{Bernoulli}(\alpha_{0ct} + \Pi_{0c}d_i + \zeta_0 pos_{ict})$$

$$\nu_{ict} \sim \text{Exp}(\alpha_{ct} + \Pi_c d_i + \zeta pos_{ict} + \eta(r_{ct} - r_{it})^2)$$

Channel-year FE

Demographics

Channel position

Viewer initial ideology

Channel ideology

Model (Viewing and Ideology Evolution)

- Ideology evolves in accordance to time spent watching on each channel:

The diagram illustrates the evolution of ideology through a mathematical equation. The equation is
$$r_{it} = \frac{r_{i,t-1} + \rho \sum_c T_{ic,t-1} r_{c,t-1}}{1 + \rho \sum_c T_{ic,t-1}}$$
 Annotations include: 'Viewer initial ideology' pointing to $r_{i,t-1}$; 'Viewer evolved ideology' pointing to r_{it} ; 'Channel ideology' pointing to $r_{c,t-1}$; 'Time spent viewing channel c' pointing to $T_{ic,t-1}$; and 'Influence parameter' pointing to ρ .

$$r_{it} = \frac{r_{i,t-1} + \rho \sum_c T_{ic,t-1} r_{c,t-1}}{1 + \rho \sum_c T_{ic,t-1}}$$

Viewer initial ideology

Viewer evolved ideology

Channel ideology

Time spent viewing channel c

Influence parameter

Model (Viewing and Ideology Evolution)

- Model of influence that generates this updating...
- Normal prior
- Receive normal signals per hour watched from ideology of channel.
- ρ can be rate of signals of given variance received per hour, or equivalently precision of signals received for given rate per hour.
- **Agent treats signals from the same channel as uncorrelated** as in DeMarzo, Vayanos, and Zweibel (2003)

Model (Cable/Satellite Subscription)

- Subscribe to cable/satellite/nothing

$$u_{ij} = v_{ij}^* + \delta_j + \epsilon_{ij}$$

- BLP specification.
- Not estimating price sensitivities.
- Heterogeneity is all in tastes for news channels.

Estimation

- Key model parameters are:
 - ρ : Influence parameter.
 - η : Taste for like-minded news.
 - ζ : Effect of channel position on viewership.
 - Channel demographic tastes and channel-year fixed effects.
- Given model parameters and data, simulate time-watched, cable/satellite subscriptions, and voting.
- **Choose parameters to match regression coefficients from model to estimated regression coefficients. (indirect inference)**

Model Estimates (under revision)

Parameter	Estimate	Bootstrapped Standard Error
Slant Preference (η)	0.163	0.0109
Ideological Influence (ρ)	0.096	0.0080
Position Effect - Ratings	-0.002	0.0002
Position Effect - Viewership	-0.085	0.0030
2000 R/D Threshold	-0.184	0.0130
2004 R/D Threshold	0.055	0.0127
2008 R/D Threshold	0.106	0.0167
Channel Ideology Intercept (a)	-0.246	0.0179
Channel Ideology Slope (b)	5.378	0.2441

Table 11: Key parameter estimates.

Model Estimates (under revision)

Age	Income (\$000s)	Ethnicity	College	Gender	Ideology	Channel Position Elasticity		
						CNN	FOX	MSNBC
65	25	White	No	Man	Centrist	17.5	16.6	16.0
65	25	White	No	Man	Median Republican	0.0	16.1	0.0
65	25	White	No	Man	Median Democrat	16.4	13.4	15.9
30	85	Black	Yes	Man	Centrist	15.8	11.7	13.6
30	85	Black	Yes	Man	Median Republican	12.8	11.2	0.0
30	85	Black	Yes	Man	Median Democrat	14.6	8.2	13.5
65	85	Hispanic	No	Man	Centrist	20.8	16.8	16.3
65	85	Hispanic	No	Man	Median Republican	18.0	16.3	0.0
65	85	Hispanic	No	Man	Median Democrat	19.7	13.5	16.2
30	25	White	Yes	Woman	Centrist	0.0	8.8	12.5
30	25	White	Yes	Woman	Median Republican	0.0	7.4	0.0
30	25	White	Yes	Woman	Median Democrat	0.0	0.0	12.4
65	25	Black	No	Woman	Centrist	18.2	16.9	15.3
65	25	Black	No	Woman	Median Republican	0.0	16.5	0.0
65	25	Black	No	Woman	Median Democrat	17.1	13.7	15.3
30	85	Hispanic	Yes	Woman	Centrist	14.6	9.0	12.8
30	85	Hispanic	Yes	Woman	Median Republican	0.0	8.5	0.0
30	85	Hispanic	Yes	Woman	Median Democrat	13.4	0.0	12.8

Table 12: Change in expected ratings (minutes watched per week) following a move from channel position 50 to channel position 30, for selected demographic and ideological profiles.

Model Estimates (under revision)

Election	Voter Ideology	1 Hour CNN	1 Hour FNC	1 Hour MSNBC
2000	Centrist	-0.016	0.014	0.004
	Median Republican	-0.078	-0.054	-0.062
	Median Democrat	0.048	0.073	0.065
2004	Centrist	-0.003	0.022	0.005
	Median Republican	-0.069	-0.048	-0.062
	Median Democrat	0.058	0.080	0.065
2008	Centrist	-0.011	0.035	-0.036
	Median Republican	-0.076	-0.039	-0.097
	Median Democrat	0.051	0.092	0.031

Table 14: Effects of watching an additional 1 hour per week on the probability of voting Republican.

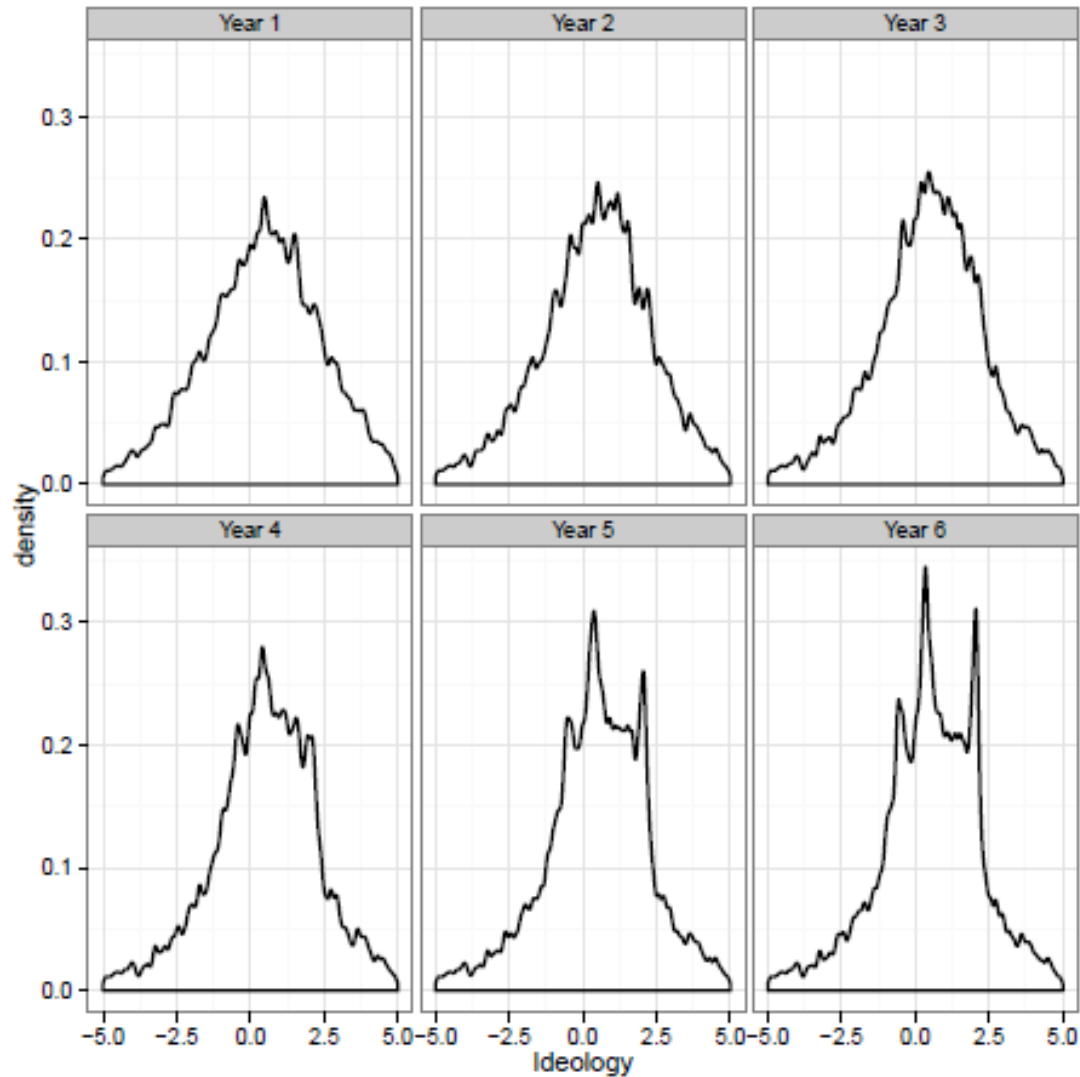
Empirical Identification

- Influence parameter determines strength of second stage hours effect in IV for voting regression.
- Taste for like-minded news explains difference between IV and OLS estimates in voting regression.
- Demographics and channel-year fixed effects have direct analogs in the first stage regressions.

Speed of Polarization

- We simulate a group of voters from 2008 unconditional distribution.
- Because of heterogeneity in taste for channels, some have high draws for MSNBC, some for Fox News..
- How quickly do they spread apart?

Speed of Polarization



Speed of Polarization

- Model estimates imply 4-5 years.
- Esteban-Ray polarization metric increases.

	2000	2004	2008
Initial	0.439	0.439	0.440
Post-Exposure	0.455	0.503	0.470
Post-Exposure (no slant preference)	0.412	0.420	0.396

Table 17: Esteban and Ray polarization measure, before and after exposure to cable news.

- Increase requires interaction of tastes for like minded news with influence effect.

Remove Fox News Counterfactual

- Drops mean county Republican vote share in 2000 election by 1.3%
- Roughly 2-4x estimate of Dellavigna and Kaplan taken at face value

Weaknesses, Future Analysis

- Are the results too big?
- Two elements:
 1. Are the “reduced form” estimates too large?
 - Instrument pushes around viewership by minutes, not hours.
 - **Heterogeneous effects**
 2. Are the model assumptions driving counterfactual results?
 - Potentially, though model follows literature fairly closely.
 - Missing heterogeneity (next slide)

Weaknesses, Future Analysis

- No panel data
- Joint distribution of ρ : Influence parameter and η : Taste for like-minded news
- **No external shocks to ideology between elections**
- Other news sources + technological change

Conclusion

- Introduce channel positions as instrumental variables.
 - Cable channel positions don't correlate with same zip satellite viewership.
 - Cable and satellite consumers look very similar.
- Measurable effect of Fox News and MSNBC on intention to vote Republican in Presidential elections.
- Estimated model implies possibility of media driven polarization over 5-10 years.

Comparison to Previous Literature

- Influence parameter: “Fox News Effect” from Della Vigna and Kaplan (2007): Introduction of FNC increases Republican vote share by 0.4 to 0.7 percentage points.
- Data set (Factbook) is severely mis-measured.
- Document in Crawford and Yurukoglu (2012) that only 30% of the data are updated year-to-year.
- Many “no FNC” markets actually do have FNC, but are not updated in data. In fact, many had in 1998.

	Year 2000 Factbook Fox News		
Nielsen Fox News	0	1	Total
0	3,632	58	3,690
1	3,076	1,520	4,596
Total	6,708	1,578	8,286

Table 5: Year 2000: Nielsen Fox News Availability and Factbook non-updated Fox News Availability.

	Year 1998 Factbook Fox News		
Nielsen Fox News	0	1	Total
0	4,837	358	5,195
1	1,871	1,220	3,091
Total	6,708	1,578	8,286

Table 6: Year 1998: Nielsen Fox News Availability and Factbook non-updated Fox News Availability.

Comparison to Previous Literature

	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*** (0.00257)	0.00869*** (0.00270)		0.00421*** (0.00154)	0.00473*** (0.00163)		0.00694*** (0.00150)	0.00741*** (0.00158)	
Nielsen Fox			0.00786*** (0.00171)			0.00400*** (0.00122)			0.00215 (0.00131)
Observations	9,256	8,286	8,286	9,256	8,286	8,286	9,256	8,286	8,286
R-squared	0.557	0.559	0.561	0.753	0.755	0.579	0.812	0.815	0.814
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
*** p<0.01, ** p<0.05, * p<0.1

Table 7: OLS, District FE, and County FE specifications from DVK and with corrected Fox News availability data.

	Republican two-party vote share change between 1996 and 1992 pres. elections					
	(1)	(2)	(3)	(4)	(5)	(6)
Factbook Fox	0.00539 (0.00503)	0.00459 (0.00507)		-0.00237 (0.00313)	-0.00271 (0.00325)	
Nielsen Fox			0.00702** (0.00337)			0.00296 (0.00205)
Observations	4,006	3,637	3,637	4,006	3,637	3,637
R-squared	0.327	0.337	0.341	0.620	0.625	0.626
Data Set	Factbook	Factbook	Nielsen	Factbook	Factbook	Nielsen
Sample	Full	Matched	Matched	Full	Matched	Matched
Specification	OLS	OLS	OLS	District FE	District FE	District FE

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: OLS and District FE Placebo specifications from DVK and with corrected Fox News availability data.