

# Electoral Effects of Biased Media: Russian Television in Ukraine



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**Abstract:** We use plausibly exogenous variation in the availability of the Russian analog television signal in Ukraine to study how a media source with a conspicuous political agenda impacts political behavior and attitudes. Using highly disaggregated election data and an original survey, we estimate that Russian television substantially increased average electoral support for parties and candidates with a “pro-Russian” agenda in the 2014 presidential and parliamentary elections. Evidence suggests that this effect is attributable to persuasion rather than differential mobilization. The effectiveness of biased media varied in a politically consequential way: Its impact was largest on voters with strong pro-Russian priors but was less effective, and to some degree even counter-effective, in persuading those with strong pro-Western priors. Our finding suggests that exposing an already polarized society to a biased media source can result in even deeper polarization.

**Replication Materials:** The data, code, and any additional materials required to replicate all analyses in this article are available on the *American Journal of Political Science* Dataverse within the Harvard Dataverse Network, at: <https://doi.org/10.7910/DVN/HI1X4O>.

On a visit to the secessionist region of Donbass, President Petro Poroshenko of Ukraine remarked that the primary task before his government was to “recover control, not so much over [lost] territory, but rather over [Ukrainian citizens’] souls poisoned by Russian propaganda.”<sup>1</sup> The hybrid war over Ukraine’s territorial integrity that ignited with Russia’s annexation of Crimea in March 2014 not only brought Russia and the West into the most intense confrontation since the Cold War but also prompted discussions about the cross-national impact of state-controlled media and state-directed informational warfare. Authorities in Ukraine and some other countries in the region banned broadcasts of Russian television in an attempt to lessen the impact of Russian media on their domestic affairs.

The European Council set up a task force to counteract Russia’s biased news reporting, and U.S. officials described the growing international presence of Russian media as a “weaponization of information,” with the “potential to destabilize NATO members, impacting [U.S.] security commitments” (HRFAC 2015).

Media broadcasts across borders to influence the adversary’s population are a time-honored tactic used during the Cold War and even earlier (Roth-Ey 2011). Over the past few decades, with the decline of dominant news networks and the rise of social media, “weaponization of information” has become a truly global phenomenon. To give just a few prominent examples, in the Middle East, cross-national Shi’a television channels pose a political concern for some Sunni governments and vice versa.<sup>2</sup> In

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<sup>1</sup>“Poroshenko smenil rukovoditelia Donetskoi oblasti,” *Ib.ua*, June 11, 2015.

<sup>2</sup>“Al-Manar, Al Mayadeen Violated Charter of Honor,” *The Daily Star* (Lebanon), December 9, 2015.

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Africa, the rise of China Central Television (CCT) is having a transformative impact on the continent's informational landscape (Gagliardone 2013). In the West, Russia has been suspected of attempting to influence elections in Germany, France, and the United States in part through hackings and selective release of sensitive information to the media.<sup>3</sup>

Despite rising global importance of biased media, our understanding of how it impacts politics remains incomplete. The existing literature has mostly focused on domestic effects of biased media and, generally, has shown that biased media has important effects on political behavior (Adena et al. 2015; DellaVigna and Kaplan 2007; Enikolopov, Petrova, and Zhuravskaya 2011; Yanagizawa-Drott 2014). The fledgling literature on cross-national effects of biased media has yielded conflicting results, suggesting that such media messages might be ineffective (Crabtree, Darmofal, and Kern 2015) or even counter-effective (DellaVigna et al. 2014; Kern and Hainmueller 2009). Generally, the current state of the literature on biased media indicates that the key question is not so much whether biased media can impact political behavior but instead *how* and *when* it can do so.

To advance the understanding of what types of consumers biased media affects most strongly and through which mechanisms, we investigate how Russian television impacted elections in Ukraine in 2014. During this period, the two countries were at the height of a military conflict by proxy, which meant that Russia had a clear stake in Ukrainian politics. The coverage of Ukrainian affairs in Russian state-controlled media was intense and conspicuously one-sided. Our empirical strategy exploits plausibly quasi-random variation in the reception of spillover Russian analog television signal across the border into Ukraine.

Using precinct-level election data, we estimate that Russian television reception has, despite its conspicuous bias, resulted in substantially and significantly higher electoral support for pro-Russian parties. These effects of Russian television are absent in several placebo tests: in the 2010 and 2012 elections, when Russian media barely covered Ukraine's domestic politics, and among Ukrainians who did not have access to terrestrial television and, accordingly, were immune to variation in the strength of Russian analog signal. Leveraging original survey data, we demonstrate that Russian television had a consistent impact not only on behaviors but also on attitudes. Finally, we document how the effectiveness of the Russian media message varied substantially depending on the political

priors of Ukrainian voters: The message was most effective among voters who held pro-Russian priors, but much less effective, and to some extent even counter-effective, among those with pro-Western priors.

These findings contribute to existing scholarship in two principal ways. First, they advance our understanding of the mechanisms by which biased media impacts political behavior. The literature is largely silent about these mechanisms. One possibility is that biased media persuades consumers by altering their beliefs; the other is that it simply mobilizes consumers without influencing their political attitudes. We show that Russian television did not just mobilize voters who were pro-Russian but actually persuaded some of them into holding more pro-Russian attitudes. In fact, we isolate the mechanism even more precisely by demonstrating that the persuasive effect of Russian television was driven specifically by *consumption of political news*, and that only those political attitudes were altered that related to subjects covered on Russian television.

Second, we contribute to the study of the heterogeneous effects of biased media. The fledgling literature on the heterogeneous effects of biased media is conflicted. In the U.S. context, DellaVigna and Kaplan (2007) find that the pro-Republican Fox News channel was more effective in pro-Democratic than in pro-Republican areas, which could be interpreted as suggesting that biased media is more effective in convincing consumers whose political priors are opposite to those of the source. In contrast, Adena et al. (2015) find that state-run radio in Nazi Germany was most effective at increasing support for Nazi policies in areas historically predisposed toward the Nazi message, arguing, in effect, that biased messaging is most effective among those who already lean in the direction of the source. Likewise, DellaVigna et al. (2014), although they do not study heterogeneity directly, report that reception of Serbian radio in neighboring Croatia increased support for both extremist Croatian nationalists and a moderate socialist party, thus providing indirect evidence that people with divergent priors react differently to the same message.

As these existing studies present evidence at the level of electoral districts or municipalities, one cannot be certain that the heterogeneous effects that they report are present at the level of individual voters due to the ecological inference problem (King 2013; Prior 2013). In this study, we use precinct-level data and individual-level survey evidence to demonstrate that biased media has similar heterogeneous effects on electoral behavior both at the aggregate and individual levels. The overall implication of our findings is that exposure to biased media tends to result in political polarization.

<sup>3</sup>“Russia Election Hacking: Countries Where the Kremlin Has Allegedly Sought to Sway Votes,” *Newsweek*, May 9, 2017.

Finally, our findings have direct relevance for current policy debates. There are very few studies on the effects of biased media in ongoing international conflicts. DellaVigna et al. (2014) study the political effects of Serbian radio in Croatia, but in a postconflict setting and without engaging in depth with the issue of heterogeneous effects of biased media. Yanagizawa-Drott (2014) examines the role that biased radio stations played in fomenting violence during the Rwandan genocide, a domestic conflict with an international dimension, but largely sets to the side the impact of media on electoral behavior or political attitudes or the heterogeneity of that influence. It is, of course, precisely in ongoing international conflicts that the political impact of biased media is most consequential. Russia has recently been implicated in efforts to influence elections in several developed democracies through misinformation campaigns, which closely resemble the ones used in Ukraine.<sup>4</sup> There are ongoing debates over whether a media source with a conspicuous political agenda can make a sizable political impact in a highly charged political environment and over the exact nature of that impact.<sup>5</sup> Our research helps to shed light on this phenomenon by explaining the nature of the potential political impact of biased media.

## Political Context

Television is the primary source of political information for 91% of Ukrainians.<sup>6</sup> Given the importance of television news to information dissemination, the Ukrainian government banned Russian state-controlled television channels from Ukraine's cable networks following Russia's annexation of Crimea in February 2014. Nonetheless, as of October 2014, it was estimated that 21% of Ukrainians, most of whom are either bilingual or fluent in Russian, still received their news from Russian television.<sup>7</sup>

To get a sense for how Russian television covered Ukraine, we collected transcripts of daily news reports broadcast in 2010–15 on Channel One, Russia's most widely watched television station.<sup>8</sup> In Figure 1, we plot

<sup>4</sup>For example, “fake news” and conspiracy theories, which became highly debated topics during the 2016 presidential elections in the United States, were routinely used by Russian television in its coverage of Ukraine; see “Russian Involvement in U.S. Vote Raises Fears for European Elections,” *The Guardian*, December 10, 2016).

<sup>5</sup>“RT’s Propaganda Is Far Less Influential than Westerners Fear,” *Economist*, January 19, 2017.

<sup>6</sup>Survey by International Republican Institute, March 2014.

<sup>7</sup>Kiev International Institute of Sociology, October 2014 (kiis.com.ua).

<sup>8</sup>The news transcripts were obtained from www.1tv.ru.

the frequency with which Ukraine was mentioned on Channel One news during this period. Prior to the Euromaidan protests late in 2013, Ukraine received relatively little attention, even during elections. However, over the course of the presidential and parliamentary elections in 2014, Ukraine became the most talked about topic. For instance, in the week prior to Ukraine's parliamentary election, Russia's most popular evening news program, *Vremia*, dedicated 31–46% of broadcast time on weekdays and 78% of its Sunday news broadcasts to Ukraine.

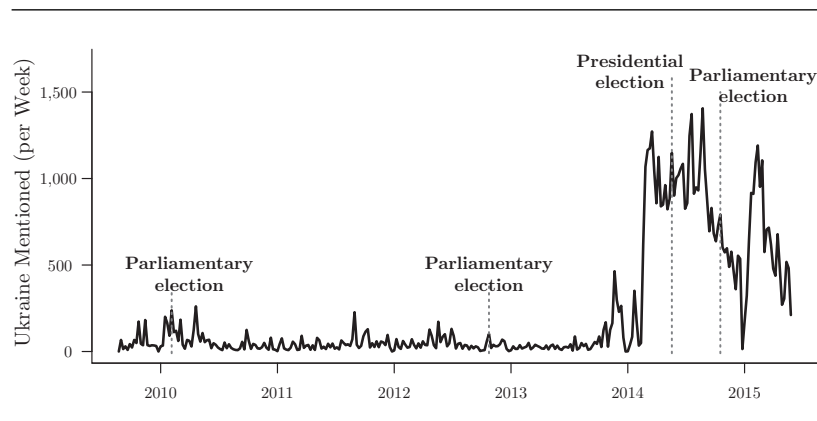
The dominant narrative across all major Russian channels was conspicuously disparaging of Ukraine's government and those political parties promoting closer integration with the West. Newscasters maintained that “ultra-nationalists” and “neo-Nazis” sponsored by Western powers were readying to run in the parliamentary election in order to construct a “new order,” that pro-Russian opposition was violently silenced, and that the incumbent post-Maidan government was an illegitimate “junta.” In Appendix 1 in the supporting information (SI), we use sentiment analysis of Russian news reports to show that such systematically negative tone of coverage on Ukraine started only after the Euromaidan protests in late 2013.

## Theoretical Expectations

The literature suggests that when media bias is *conspicuous*, consumers will discount its message if it contradicts their priors. In political psychology, the discounting of information that conflicts with one's priors is variously referred to as “biased assimilation” (Lord, Ross, and Lepper 1979), “motivated reasoning” (Ditto and Lopez 1992), or “motivated skepticism” (Taber and Lodge 2006). Models of media persuasion in political economy also arrive at the conclusion that consumers will discount biased information that is inconsistent with their priors (Gehlbach and Sonin 2014; Gentzkow and Shapiro 2006). Psychological theories of information updating make an even stronger prediction that biased messages may backfire when targeted at consumers with opposing priors, leading to polarization (Ditto and Lopez 1992; Lord, Ross, and Lepper 1979). In Appendix 2 in the SI, we present a stylized model showing that media can generate such polarizing effects even among fully rational consumers of content when there is uncertainty about the degree of bias of the media source, and when consumers' priors are sufficiently divergent.

This discussion yields the following empirical expectations. First, given that the area of our study has

**FIGURE 1** Frequency of Coverage of Ukraine on Channel One News



historically been relatively pro-Russian, we expect that exposure to Russian television *on average* increased electoral support for pro-Russian parties and candidates in the 2014 elections. Second, we expect that Russian television had a persuasive effect on voters with pro-Russian priors and was considerably less persuasive, or even disuasive, with voters who held pro-Western priors.

## Data

Our study covers electoral precincts in three provinces (*oblasts*) of northeastern Ukraine: Chernihiv, Sumy, and Kharkiv (see Figure 2). The two provinces east and south of our study area—Luhansk and Donetsk—also share an extended border with Russia, but we could not include them in our analyses, as most polling stations there were closed due to ongoing conflict.

### Election Data and Variables

We focus on two national elections held in 2014 when Ukrainian domestic affairs were prominent on Russia's news agenda. We also use the results from the two preceding elections—the 2010 presidential (second round) and the 2012 parliamentary races—for placebo tests.<sup>9</sup> In these earlier elections, Russia did not have a strong stake in Ukrainian politics, and coverage of Ukraine on Russian news was limited. All precinct-level data come from the Central Election Commission of Ukraine (CEC).

Ukraine has a multiparty system with numerous candidates and political parties. Analyzing the effects of Russian television reception on each candidate and party separately is unwieldy and not very informative, as

<sup>9</sup>We could not use the 2010 election results as control variables because precinct boundaries changed between 2010 and 2012.

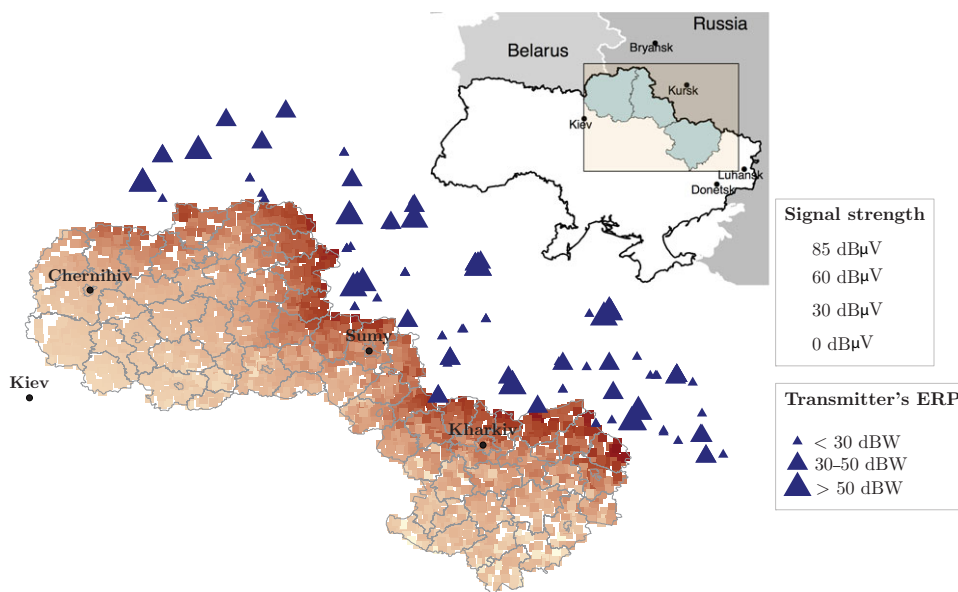
multiple candidates and parties run on similar platforms. To circumvent this problem, we classify all candidates and parties into the pro-Russian and pro-Western blocs, representing, in a simplified fashion, the key cleavage in contemporary Ukrainian politics (Frye 2015). We code candidates and parties as pro-Western if they publicly advocated for Ukraine's membership in the European Union or NATO or promoted the strengthening of economic, social, or military ties with Western and Central Europe. In contrast, those candidates and parties calling for closer relations with Russia are coded as pro-Russian. For presidential contenders, we label all those who served exclusively in the Viktor Yushchenko or Yulia Tymoshenko administrations or who were active on the side of the anti-Yanukovich protesters during the Euro-maidan protests as pro-Western. Those who served exclusively in the Yanukovich government are labeled as pro-Russian. The list of all parties and candidates along with their classification is provided in Appendix 3 in the SI.

### Reception of Russian Television

We use the Irregular Terrain Model (ITM; following Olken 2009) to measure the quality of reception of Russian analog television in Ukraine. Information on the locations and technical parameters of Russian television transmitters and relays was obtained from the International Telecommunication Union. All Russian transmitters broadcasting channels that carry news programming and located within 100 kilometers of the area under study are included in our analyses. Terrain elevation measures are taken from the 30-arc-second gridded quality-controlled global Digital Elevation Model (GLOBE Task Team 2010).

When calculating television or radio signal strength at a specific location, the conventional practice is to take the

**FIGURE 2 Russian Analog TV Transmitters (Triangles) and Predicted Signal Strength at Polling Stations**



Note: Gray lines are for county borders. ERP = effective radiated power.

most powerful transmitter signal of several that might be available in that location (Adena et al. 2015; Enikolopov, Petrova, and Zhuravskaya 2011). We take a different approach. In our view, the quality of television reception is measured more accurately by averaging across a small number of the highest-quality signals because minor obstacles (e.g., antenna turned in the wrong direction) can impede reception from any one transmitter. Our survey, which is described below, provides self-reported information about the reception of Russian television across 160 locations. We find that whether a household is able to watch Russian TV is better predicted by averaging out across the four highest-quality transmitter signals (see Appendix 4 in the SI for details). Thus, our measure of raw signal strength (*Signal*) is the average of the four strongest signals at a given location.

In Figure 2, we map out the location of all Russian transmitters in the vicinity of the Ukrainian border and plot field strength of the Russian analog television signal at each Ukrainian polling station under study. Signal quality varies substantially across the relatively small area of our study. In about 8% of the precincts, Russian TV signal is of very high quality at above 60 dBμV (in these precincts, the probability of self-reported reception of Russian television varies from 0.36 to 0.84). In about 60% of the precincts, the signal is in a range where viewers are still able to watch Russian television (20–60 dBμV) but at lower quality and reliability (the probability of reception

there ranges from 0.02 to 0.36). In the remaining 22% of precincts, it is practically infeasible to receive Russian analog television.

Using estimated signal field strength, *Signal*, we construct the variable *Reception*, which represents the probability that a precinct receives Russian analog television. We estimate the probability of the availability of Russian television from the following probit model:

$$\Pr\{\text{Receives Russian TV}_i = 1\} = \Phi(\lambda(\text{Signal}_i)), \quad (1)$$

where  $i$  stands for the individual survey respondent,  $\Phi$  is the standard normal distribution function, and  $\lambda$  is an unknown continuous function, which we estimate with thin plate regression splines (Wood 2003). This model form allows television reception to vary nonlinearly as a product of signal strength. As we show in Appendix 4 in the SI, the probability that a particular location receives Russian television increases very gradually when signal strength is low and then steeply when *Signal* takes on high values. All the results below hold irrespective of whether we use raw signal strength or probability of reception as our main independent variable. In all precinct-level analyses that follow, we use *Reception* as the main independent variable. In individual-level analyses in which it is the viewing of Russian television and not its availability that is the independent variable of interest, we instrument for consumption of Russian television with the *Signal* variable.

## Precinct-Level Covariates

In the analyses that follow, we control for a number of covariates. These include pre-existing political preferences (pro-Russian vote and turnout in the 2012 parliamentary election), the level of economic development (density of road networks within a 1 kilometer radius of the polling station), population size (number of registered voters), and whether the precinct is rural or urban. We also control for the percent of Ukrainian speakers as reported in the most recent (2001) census. Census statistics are available only at the settlement level, which, in the urban context, results in multiple precincts' being assigned the same value on this variable. This imprecision in measurement does not appear to create a problem, as our results turn out to be similar for rural and urban precincts irrespective of whether we control for language.

## Survey

We fielded a survey of 1,676 respondents in 160 electoral precincts located within 50 kilometers (31 miles) of the Ukrainian–Russian border in January–April 2015. We focused on precincts located in such close proximity to the border in order to control for distance from Russia by design. The sampling scheme and the survey instrument are described in Appendix 5 in the SI. The survey asked about television viewing habits, voting behavior, and demographic information, including language, income, education, and frequency of travel to Russia (intended to capture the depth of cross-border family, friendship, and economic ties). Summary statistics for key variables are provided in Appendix 6 in the SI.

## Research Design

This study is an example of “encouragement design” (Duflo, Glennerster, and Kremer 2007; Hirano et al. 2000), in which it is not the treatment itself but the availability of a treatment that is randomly assigned. The encouragement design idea stipulates that in precincts with good Russian television reception, individuals are *encouraged* to watch it. In this framework, we can estimate the causal effect of the *availability* of Russian television on electoral behavior in Ukraine, but not the effect of its actual *consumption*. These two effects can be quite different (Angrist, Imbens, and Rubin 1996). To estimate the effect of actual consumption of Russian television, we later turn to survey data.

The key identifying assumption behind this research design is that, conditional on geographic covariates, the

availability of Russian analog television is exogenous to standard determinants of political attitudes and behavior. One possible challenge to this assumption is that the strength of Russian television signal tends to improve in the immediate vicinity of the Russian border. This geographic variation might in some way correlate with political behavior, thus confounding the effect of Russian television that we set out to estimate. To deal with this problem, we control flexibly for distance to the Russian border and include fixed effects for counties (*raions*) or electoral districts.<sup>10</sup> Thus, our identification comes from variation in the level of reception of Russian television *within* small geographic units (counties or electoral districts) located at similar distance from the Russian border.

We perform a series of balance tests to determine whether Russian television reception is orthogonal to pretreatment covariates after controlling for geographic factors. We first estimate residualized television reception using the following semiparametric ordinary least squares (OLS) regression model:

$$\text{Reception}_i = f(\text{Distance to Russia}_i) + \text{County}_{j(i)} + \epsilon_i, \quad (2)$$

where  $f$  is an unknown smooth function approximated by natural cubic splines,<sup>11</sup>  $\text{County}_{j(i)}$  is a county fixed effect, and  $\epsilon_i$  is the error term clustered by county.<sup>12</sup> For robustness, we also consider an alternative specification with fixed effects for electoral districts.

Next, we regress the pretreatment variables—potential determinants of political behavior that might confound the effect of Russian television—on residualized signal strength. The results are reported in Table 1. Variables in rows 1–10 are measured at the precinct level (*Percent Ukrainian speakers* is at the settlement level), and those in rows 11–14 are individual-level variables averaged across precincts. Covariate balance is generally good. Most importantly, reception of Russian television is not correlated with pro-Russian vote share in the 2012 parliamentary election and the 2010 presidential election—those coefficients are small, unstable, and never statistically significant. Once geographic factors are adjusted for, Russian television reception is not related to either

<sup>10</sup>There are 26 electoral districts and 66 counties in the area of our study. Counties are mostly nested inside districts, except in urban areas, where a county might include several districts.

<sup>11</sup>To choose the number of knots in a spline, we use the Bayesian information criterion, as suggested by Molinari, Durand, and Sabatier (2004). This way we estimate a function of distance to Russia,  $f$ , that can best explain the variation in television reception without overfitting.

<sup>12</sup>We compute clustered standard errors and p-values using wild cluster bootstrapping (Cameron, Gelbach, and Miller 2008). Alternative bootstrapping methods yield very similar results.

TABLE 1 Balance Tests

	County Fixed Effects			District Fixed Effects			Obs.
	Est.	SE	p-val.	Est.	SE	p-val.	
<b>Precinct- or settlement-level variables</b>							
1. Pro-Russian vote, 2012	1.30	4.57	.78	−1.15	8.08	.89	3,589
2. Pro-Russian vote, 2010	−0.37	11.20	.97	1.42	6.68	.83	3,659
3. Percent Ukrainian speakers	−3.22	7.98	.69	4.10	8.73	.64	2,058
4. Turnout, 2012	−3.24	4.63	.48	−0.36	2.24	.87	3,589
5. Turnout, 2010	−5.43	3.62	.13	−3.58	2.55	.16	3,659
6. Voting population (log)	−0.01	0.51	.99	−0.13	0.22	.54	3,589
7. Rural precinct	0.13	0.29	.66	−0.02	0.11	.82	3,589
8. Road density	0.30	0.57	.60	0.05	0.14	.72	3,589
9. Km to Kiev (log)	0.01	0.21	.97	−0.00	0.15	.99	3,589
10. Km to Donetsk (log)	−0.01	0.16	.96	0.03	0.15	.85	3,589
<b>Individual-level variables (averaged over precincts)</b>							
11. Ukrainian usage	−0.46	0.45	.31	−0.28	0.50	.57	160
12. Education	−0.10	0.10	.34	−0.06	0.11	.62	160
13. Travel to Russia	0.02	0.06	.76	0.03	0.06	.64	160
14. Income	−0.16	0.15	.29	−0.07	0.19	.72	160

Note: OLS coefficients for residualized Russian television reception are reported. Standard errors are clustered by county.

socioeconomic features of precincts (number of registered voters, rural/urban location, road density) or other geographic features like distance to the capital Kiev and distance to Donetsk (a major city in the conflict zone). Individual-level covariates are also well balanced.

Although the coefficients in the balance tests are never significant, in a few cases they are somewhat large. *Percent Ukrainian speakers* is one such case. However, that coefficient is extremely unstable, changing sign depending on whether county or district effects are controlled for. The coefficient for turnout in the 2010 election is also large but very brittle: When we drop the control for distance to Russia, the coefficient for 2010 turnout shrinks to −2.2 when county effects are controlled for and to 0.3 in analyses controlling for district fixed effects. In contrast, the coefficients for voting in the 2014 elections *increase* when distance to Russia is not controlled for. This suggests that the potential lack of balance with respect to turnout in 2010 is unlikely to indicate substantial problems with our identification strategy. We conduct a number of additional balance tests in Appendix 7 in the SI to demonstrate that there is balance on voting patterns and turnout at least as far back as 2006–7 and on a number of additional demographic and geographic factors.

Two additional concerns regarding identification are worth noting. First, Russia might be building its television transmitters strategically in order to influence

Ukrainian voters. According to the data by the International Telecommunication Union, Russia issued 108 new analog television transmitter licenses from 2013 to 2015. None of these new transmitters were placed in the vicinity of the Russian–Ukrainian border. In fact, in June 2015, Russia reduced the power of television transmitters along its border with Ukraine.<sup>13</sup> This is the opposite of what one would expect had Russia been strategically placing its transmitters along the Ukrainian border.

Another potential source of concern is residential self-sorting: Individuals might relocate to places with better (worse) Russian analog television reception if they already have pro-Russian (pro-Western) sympathies and values. This concern is exacerbated by the fact that millions of internally displaced persons (IDPs) moved from the conflict zone in the east to other parts of Ukraine. While this type of self-sorting is possible in theory, there is little empirical support for this notion. The IDPs typically move to settlements where there are jobs and government services geared toward them (primarily cities and large towns), and it is highly unlikely that the

<sup>13</sup>Federal State Unitary Company “Russia’s Television and Radio Network” (RTRN), June 2015, “RTRN Adjusted the Frequency of Transmission of 286 Television Transmitters in Order to Comply with the Geneva-6 International Agreement” (in Russian). Note that this change came *after* the period of our study; thus, it could not impact our results.

IDPs would prioritize the availability of Russian analog television when deciding where to relocate.<sup>14</sup> In addition, the movement of the IDPs began in earnest in the summer of 2014, whereas we identify electoral effects of Russian television as of May 2014. In summary, the overall evidence indicates that the main assumptions behind our research design are well justified. At the same time, as in any observational study, the problem of confounders can never be ruled out conclusively, so the results should be interpreted with caution.

## Biased Media and Mass Electoral Behavior

In this section, we examine the effect of the reception of Russian television on precinct-level electoral outcomes. To estimate these effects, we use the following semiparametric OLS regression:

$$y_i = \gamma \cdot \text{Reception}_i + f(\text{Distance to Russia}_i) + \text{County}_{j[i]} + \beta' \mathbf{x}_i + \epsilon_i, \quad (3)$$

where  $y_i$  is the percentage of votes cast for pro-Russian parties in the 2014 presidential or parliamentary elections. The coefficient  $\gamma$  for *Reception* is the key parameter of interest. As in the balance tests,  $f$  is a continuous function modeled by natural cubic splines (spline selection follows the same steps as in balance tests); *County* and  $\mathbf{x}$  are fixed effects and control variables, respectively. In Appendix 8 in the SI, we explore the impact of Russian television reception on turnout but do not find any evidence of a relationship between these two variables.

Results from the regressions are reported in Table 2. We separately estimate a baseline model, which only includes geographic controls and a full specification with all the covariates described in Table 1. The size of the estimates for the effect of Russian television decreases somewhat as we move to the “full” model, but the difference between the baseline and full model estimates is not statistically significant. When interpreting the results, we rely on the more conservative estimates from full models.

As the probability that Russian television is available increases from 0 to 1, the average percentage of votes cast for pro-Russian candidates and parties in the 2014 presidential and parliamentary elections increases by about 7.5 percentage points. These effects are significant at the 99% confidence level. A shift from complete absence of Russian television to perfect reception is obviously quite extreme. More meaningfully, improvement in the quality of

<sup>14</sup>“Refugee World Day: Where Re-settlers from Donbass Are Forced to Migrate,” Bigmir.net, accessed on 4 August 2015.

TABLE 2 Precinct-Level Regression Results

	Presidential		Parliamentary	
	Baseline	Full	Baseline	Full
Russian TV reception	9.57** (3.33)	7.62** (2.57)	10.92*** (2.91)	7.48** (2.32)
Percent Ukrainian speakers		−0.05** (0.02)		−0.09*** (0.01)
Pro-Russian vote in 2012		0.43*** (0.05)		0.48*** (0.05)
Turnout in 2012		−0.03 (0.02)		−0.07** (0.03)
Log(Number of voters)		−0.44 (0.44)		−1.96** (0.59)
Rural precinct		0.80* (0.36)		1.84*** (0.38)
Road density		−0.42 (0.27)		−0.02 (0.18)
Persuasion rate	8.18	6.52	8.44	5.80
Adjusted R <sup>2</sup>	0.87	0.92	0.87	0.92
Observations	3,589	3,567	3,589	3,567

Note: Dependent variables are vote percentages for pro-Russian parties. All specifications control for county-level fixed effects and smoothing splines for distance to Russia. Standard errors (in parentheses) are clustered by county.

\*p < .05, \*\*p < .01, \*\*\*p < .001.

Russian TV reception by one standard deviation is associated with an increase in average support for pro-Russian parties of 1.2 and 1.1 percentage points in the presidential and parliamentary elections, respectively. In the area under study, pro-Russian parties received 22% and 27% of the vote in the two elections. Therefore, one standard deviation change in Russian television reception accounts for about  $1.2/22 \times 100\% \approx 5\%$  and  $1.1/27 \times 100\% \approx 4\%$  of the votes amassed by pro-Russian parties in the two elections.

In Table 2, we also report the persuasion rates—the percentage of voters, among those with access to Russian television, who were persuaded to vote for pro-Russian parties as a result of exposure to Russian television (DellaVigna and Kaplan 2007).<sup>15</sup> Roughly 6% of voters in each of the two elections were persuaded to vote for pro-Russian parties because of the *availability* of Russian television. For comparison, in a study of

<sup>15</sup>The method for calculating the persuasion rates is explained in Appendix 9 in the SI.



the effectiveness of pro-opposition media *inside* Russia, Enikolopov, Petrova, and Zhuravskaya (2011) estimate persuasion rates at 7.7%. Our effect is somewhat smaller (in full specifications) but comparable. Note that these effects mask important heterogeneities in voters' behavior and are a product of the mere *availability* of Russian TV, not of its consumption.

To evaluate the robustness of these results, we perform a battery of additional tests that are summarized in Table 3. We check whether our results might be driven by differences between precincts that are especially distant (and therefore different) from one another by restricting the sample to precincts close to the border (row 1) and further away from it (row 2). We exclude all the precincts with either very good or very bad reception of Russian television (row 3). We examine separately the effects in rural (row 4) and urban precincts (row 5). We check to see whether the results are robust to inclusion of district fixed effects (row 6), distance to the cities of Kiev and Donetsk (row 7), and the quality of reception of *Ukrainian* analog television (row 8). To ensure that the results are not an artifact of how we coded pro-Russian and pro-Western political forces, we consider separately the results for Petro Poroshenko, the presidential candidate who advocated closer alliance with the EU and NATO (row 9), and the Opposition Block party, successor to the pro-Russian Party of Regions (row 10). The magnitudes of the coefficients vary across specifications within reasonable bounds, but they are generally consistent with our main results. As an additional robustness check, in Appendix 10 in the SI, we estimate the main regressions using covariate balancing propensity weights and find that the results are highly consistent.

In row 11, we report results from a test for bias due to unobservables in the spirit of Altonji, Elder, and Taber (2005). Following the approach in Enikolopov, Petrova, and Zhuravskaya (2011), we first regress *Reception* on all the covariates and then estimate regressions with the full set of covariates and predicted values of *Reception*. The correlation between the index of observables that best predict the variation in Russian television reception and pro-Russian voting is not significant and flips sign depending on specification. Finally, in rows 12–13, we report results from a placebo test that examines whether the reception of Russian channels that do not carry news impacted voting.<sup>16</sup> Availability of Russian entertainment channels has no statistically significant effect on voting

<sup>16</sup>These include Disney (animation), Kultura (culture), Peret (youth entertainment), Rossiya 2 (sports), and TNT (films).

behavior.<sup>17</sup> This suggests that Russian media is influencing Ukrainian voters only through political programming and not through entertainment channels.

## Individual-Level Mechanisms

Up to this point we have used quasi-exogenous variation in signal strength of Russian television to explore the effects of biased media at the aggregate level. However, the preceding estimates only capture the effect of media availability, not of its consumption. Second, because of the ecological inference problem (King 2013), we do not know whether the same voters who had access to Russian television were also the ones voting for pro-Russian candidates. Third, and most importantly, on the basis of the evidence presented thus far, we do not know whether Russian television simply mobilized pro-Russian voters or if it actually changed their attitudes by making them more favorably predisposed toward pro-Russian parties. In this section, we draw on individual-level data to better understand microlevel mechanisms driving our results.

We first estimate the effect of consumption of Russian television on Ukrainian voters. We do that within the instrumental variable (IV) framework. The quality of Russian analog signal is our instrument for consumption of Russian news. The measure of Russian news consumption is the binary variable *Watch*, which is equal to 1 if the respondent reports watching *news* on any of the four leading Russian television channels<sup>18</sup> and equal to 0 otherwise. Given that the quality of reception of Russian television varies nonlinearly as a product of signal strength, we allow the propensity to *watch* Russian television to vary nonlinearly with signal strength. Thus, for the first stage, we specify a semiparametric regression of the following form:

$$\text{Watch}_i = g(\text{Signal}_{j[i]}) + \text{County}_{k[i]} + \boldsymbol{\gamma}' \mathbf{x}_i + \epsilon_i, \quad (4)$$

where  $\text{Signal}_{j[i]}$  is the strength of Russian television signal in the precinct where respondent  $i$  resides and  $g$  is an unknown smooth function approximated by smoothing regression splines.<sup>19</sup>  $\text{County}_{k[i]}$  is the county fixed effect, and  $\mathbf{x}_i$  is a set of individual-level covariates—the use of

<sup>17</sup>The reported coefficients are from regressions that control for all covariates as well as reception of political channels. In comparisons, for specification in row 13, the coefficients for the reception of political channels are 9.74 (SE = 3.39) for presidential and 6.31 (SE = 2.12) for parliamentary elections, both significant at the .01 level.

<sup>18</sup>These are Channel One, Rossiya 1, NTV, and Channel 5.

<sup>19</sup>We use natural cubic splines and select the number of knots based on the Bayesian information criterion.

**TABLE 3 Robustness Checks: Regression Coefficients for Russian TV Reception**

	Presidential		Parliamentary		Obs.
	Coef.	SE	Coef.	SE	
1. Distance to Russia < 50 km	7.46**	(2.51)	7.14**	(2.36)	1,816
2. Distance to Russia > 25 km	4.60*	(1.92)	7.99***	(1.79)	3,030
3. TV reception $\in$ (0.2, 0.8)	9.75**	(3.43)	9.33*	(3.39)	676
4. Only villages	8.71*	(3.29)	5.93	(3.27)	1,977
5. Only towns and cities	5.50*	(2.27)	6.67***	(1.30)	1,590
6. District effects	9.57***	(2.72)	5.71**	(1.96)	3,567
7. Distance to Kiev and Donetsk	7.63**	(2.62)	6.97**	(2.17)	3,567
8. Control for Ukrainian TV reception	7.59**	(2.60)	7.35**	(2.23)	3,567
9. Dep. var. = Poroshenko vote	-5.53*	(2.11)			3,567
10. Dep. var. = "Opposition Block" vote			5.47**	(1.60)	3,567
11. Altonji-Elder-Taber-style test	8.55	(8.53)	-2.46	(6.46)	3,567
12. Placebo signal, county effects	5.57	(5.08)	7.61	(4.07)	3,567
13. Placebo signal, district effects	-0.44	(3.98)	-1.55	(2.71)	3,567

Note: All specifications include the full set of covariates. Standard errors (in parentheses) are clustered by county.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Ukrainian versus Russian language, income, education, and frequency of travel to Russia (covariates are entered as factors for additional flexibility).<sup>20</sup> The second-stage specification is as follows:

$$y_i = \beta \cdot \widehat{\text{Watch}}_i + \text{County}_{k[i]} + \mathbf{w}'\mathbf{x}_i + u_i, \quad (5)$$

where  $y_i$  is an individual's vote choice or a measure of political attitudes, and  $\widehat{\text{Watch}}_i$  is the fitted value from the first stage. The parameters are estimated using a two-stage least squares (TSLS) linear probability model, and standard errors are clustered by precinct since the instrument varies by precinct and not at the level of individuals.

We consider behavioral and attitudinal outcomes. The behavioral measures are vote choice in the 2014 presidential and parliamentary elections, and these take on the value of 1 if the respondent voted for pro-Russian candidates and parties. The attitudinal measures are the respondent's agreement with the view that the post-Maidan Ukrainian government is illegitimate (the position strongly advocated on Russian television) and whether the respondent says that she trusts Russia's President Vladimir Putin. We also consider variation on three "placebo" attitudes: favorable view of state ownership and positive assessment of Lenin and Stalin. These are attitudes that strongly correlate with a pro-Russian

position but are not frequently discussed on Russian news and therefore should not be affected as a result of exposure to Russian television. All of the attitudinal outcomes were measured on a 5-point Likert scale. We rescale these variables to vary between 0 and 1 so that 1 is a maximum value and represents the most pro-Russian attitude on a given question.

Second-stage IV coefficients for watching Russian news and first-stage statistics are reported in Table 4 (full results are in Appendix 11.1 in the SI). Watching Russian news increased the probability of voting for pro-Russian candidates by 0.26 and 0.46 points in presidential and parliamentary elections, respectively. The estimate for the presidential election is considerably lower and not statistically significant. This might be due to the fact that by the time the survey was fielded, 9–11 months after the presidential election, respondents made more recall errors, which biased the coefficient downward (Hyslop and Imbens 2001).<sup>21</sup>

Watching Russian news also had a substantively meaningful and statistically significant impact on respondents' political attitudes with regard to issues covered by Russian media. Respondents who watched Russian news were 0.43 points more likely to consider the post-Maidan Ukrainian government illegitimate. Remarkably,

<sup>20</sup>We do not control for distance to the Russian border because we deliberately sampled precincts that are situated very close to the border (50 km/31 mi) in order to control for proximity effects by design. Also, we control for how often a respondent travels to Russia, which meaningfully captures personal and business ties to Russia.

<sup>21</sup>Our case is quite unusual in that both the treatment (self-reports about watching Russian news) and the outcome (voting for pro-Russian candidates and holding pro-Russian attitudes) variables are subject to social desirability bias. In Appendix 12, we provide an extensive formal treatment of this problem and show that such double social desirability bias can quite substantially attenuate the estimated effects.

TABLE 4 Second-Stage IV Coefficients for Watching Russian News

Main outcomes	Estimate	SE	p-value	First stage F	Obs.
Vote pro-Russian (president)	0.26	0.16	.10	13.14	346
Vote pro-Russian (parliament)	0.46	0.22	.04	12.05	341
Post-Maidan government illegitimate	0.43	0.13	.00	23.97	499
Trust Vladimir Putin	0.30	0.11	.01	27.26	566
<b>“Placebo” outcomes</b>					
Favors state-owned property	0.13	0.08	.10	32.66	598
Positive toward Lenin	0.07	0.10	.52	24.15	575
Positive toward Stalin	−0.02	0.11	.87	24.69	567

Note: All specifications include standard covariates and county fixed effects. Standard errors are clustered by precinct.

watching Russian news also increased the level of trust in Russia’s President Putin by 0.30 points despite the ongoing proxy conflict with Russia. Consistent with expectations, consumption of Russian news does not seem to affect the “placebo” outcomes (those not directly addressed in news programming). All of the placebo coefficients are small and not significant statistically.<sup>22</sup>

The results suggest that biased media is capable of changing consumers’ attitudes through persuasion. Thus, mass-level behavioral effects of biased media documented earlier are likely due to persuasion and not merely to Russian media selectively mobilizing its consumers. Just as one would expect, the effects associated with *viewing* Russian news are much stronger than those associated merely with its *availability*. Specifically, consumption of Russian TV news is about twice as effective as its availability. The calculation runs as follows. According to survey data, analog signal is available in about 40% of all the sampled settlements. Those who watch Russian television are 0.46 points more likely to vote for pro-Russian candidates in parliamentary elections. Therefore, the potential aggregate-level effect of consuming Russian news is  $40\% \times 0.46 \approx 18\%$ . In precinct-level analyses, the effect of Russian television availability was about 7.5%, or a little less than half of the consumption effect.

The results from instrumental variable regressions are only valid as long as one is willing to accept the exclusion restriction, that is, the idea that reception of Russian television impacts behavior and attitudes only through consumption of Russian news and not in some other way. We use evidence from the survey to investigate this assumption. Fifty-four percent of survey respondents do

not have access to analog television; they can be thought of as “placebo consumers.” If the exclusion restriction holds, political behavior and attitudes of these placebo consumers should not be in any way affected by the fact that some of them reside in settlements where Russian analog television is accessible. That is precisely what we find: Variation in Russian analog television reception has no effect on placebo consumers (for evidence, see Appendix 11.6 in the SI).

## Priors and the Effectiveness of Biased Media

In this section, we consider whether Russian television had a variable effect on voters with opposite political priors. As before, we first present precinct-level analyses (uninformative about microlevel mechanisms but less subject to measurement errors) and then individual-level analyses (informative about mechanisms but more subject to measurement errors).

### Aggregate-Level Heterogeneity

At the precinct level, we measure pre-2014 political priors by considering how the precinct voted in the 2012 parliamentary election. The assumption is that a precinct that voted heavily for pro-Russian parties in 2012 is one where there are a lot of voters with pro-Russian priors. The reader will recall that the quality of reception of Russian television is not correlated with voting outcomes in 2012. In estimating the heterogeneous impact of Russian television, we use the following regression model:

$$Y_i = \sum_{\ell=1}^L \gamma_{\ell} \times \text{Reception}_i \times X_{i,\ell} + \sum_{\ell=1}^L \beta_{\ell} \times X_{i,\ell} + f(\text{Distance}_i) + \text{County}_{j[i]} + \epsilon_i, \quad (6)$$

<sup>22</sup>In Appendixes 11.2–11.5 in the SI, we conduct a number of robustness tests for our IV results, including matching on covariates, rerunning the regression as OLS, controlling for self-reported pro-Russian voting in the 2010 election, and estimating the consumption effects on the intensive margin. The results of all of these analyses are consistent with our main findings.

where vector  $(X_{i,1}, \dots, X_{i,L})$  contains the constant term and all of the covariates, including voting outcomes in 2012. We interact *Reception* with every covariate in order to rule out the possibility that the resultant heterogeneity is a product of factors other than variation in voting outcomes in 2012.

In Figure 3, we plot sample-averaged marginal effects of Russian television reception conditional on pro-Russian vote share in the 2012 election (regression results are reported in Appendix 13.1 in the SI). There is strong evidence that Russian television affects different types of voters differently. The persuasive effect of Russian television reception was largest in precincts that historically voted overwhelmingly for pro-Russian parties. This effect weakens as we move to less pro-Russian precincts. The attenuation rate was 0.59% in the presidential and 0.45% in the parliamentary elections (reported in the top quadrant of the figure). This means that the effectiveness of the Russian news message increased by about 5% for every 10% increase in the precinct-level pro-Russian vote in the 2012 election. Moreover, pro-Russian vote in 2012 is the *only* covariate that is significant in interaction with *Reception* (see Appendix 13.1 in the SI). This means that it is prior political preferences, not other background factors correlated with those preferences, that are driving the heterogeneity.<sup>23</sup>

The effect of Russian television on Ukrainian voters does not just decrease as we move from historically pro-Russian to historically pro-Western precincts but becomes altogether negative below a certain threshold. Specifically, Russian television reception *reduced* the support for pro-Russian candidates in 2014 in precincts where in 2012 pro-Russian parties received less than 30% of the vote (about 18% of all precincts). While the availability of Russian television had a persuasive effect on average, its message was highly effective in communities where many voters were a priori already sympathetic to it, was less effective in communities where pro-Russian preferences were weaker, and had a dissuasive effect in communities with strong pro-Western priors.<sup>24</sup>

<sup>23</sup>In Appendixes 13.2 and 13.3, we estimate a simpler and a more flexible interactive model, respectively. In Appendix 13.7, we implement a fully nonparametric model using the kernel regularized least squares (Hainmueller and Hazlett 2014). Results of these analyses are consistent with the findings reported here.

<sup>24</sup>Why would pro-Western Ukrainians consume Russian media? Studies suggest that media consumers often do not discriminate between news sources if the covered events are of personal interest (Stroud 2011). Our survey shows that 76% of Ukrainian speakers watch Russian television where it is available.

## Individual-Level Heterogeneity

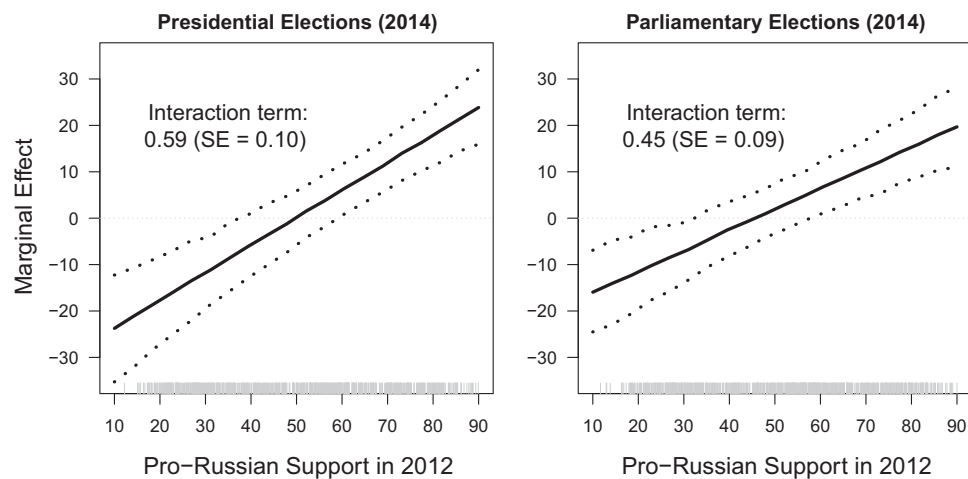
Having established in aggregate-level analyses that Russian media has a heterogeneous impact on Ukrainian voters, we now turn to individual-level data to investigate whether different types of voters are being *persuaded* differently as a result of exposure to Russian news. One concern that must be resolved first is that political priors are difficult to measure at the individual level because recall biases and errors render self-reports of past voting behavior unreliable (Weir 1975; Wright 1993). Even if we use such self-reports, our sample would be limited only to those who voted in both the 2014 election (dependent variable) *and* the 2012 election (measure of political priors), resulting in substantial attrition. Instead, we opt for an alternative measure of political priors that is commonly, albeit not universally, accepted in the literature on Ukrainian politics to stand in for political priors: language usage. Studies of the Ukrainian electorate generally concur that Russian speakers are more likely to favor closer relations with Russia than Ukrainian speakers (Colton 2011; Hesli, Reisinger, and Miller 1998; Kulyk 2011). Thus, our proxy measure of prior political preferences is a five-category variable indicating language use in everyday interactions—from speaking only in Russian (0) to speaking only in Ukrainian (4).

When estimating individual-level heterogeneous effects, we follow the approach suggested by Wooldridge (2006). We augment the preceding individual-level two-stage least squared regressions by including an interaction between *Watch Russian TV* and *Ukrainian usage* in the second stage and an interaction between *Signal* and *Ukrainian usage* in the first stage.<sup>25</sup> As before, we control for a set of individual-level covariates and county fixed effects and cluster standard errors by precinct.

In Table 5, we report second-stage coefficients for Russian news consumption and first-stage statistics (full output is in Appendix 13.4 in the SI). The coefficient for *Watch Russian TV* is the effect of watching Russian television only on those respondents who speak exclusively in Russian: In all four cases, the coefficient is positive and statistically significant. This means that respondents with strongly pro-Russian preferences are significantly more likely to vote for pro-Russian parties and to hold pro-Russian attitudes. The coefficients for the interaction between *Watch Russian TV* and *Ukrainian usage* are negative in all four specifications and statistically significant for one behavioral (vote in the presidential election) and

<sup>25</sup>In Appendixes 13.5 and 13.6 in the SI, we present two more flexible IV specifications: one where each covariate is interacted with the treatment and another where treatment is interacted with language use as a factor.

**FIGURE 3** Estimated Sample-Averaged Marginal Effects of Russian Television Reception for Different Values of Prior Pro-Russian Support



Note: The 95% point-wise confidence bounds are displayed.

**TABLE 5** Second-Stage IV Estimates of the Heterogeneous Effects of Watching Russian Television after Controlling for Covariates and County Effects

	Vote Pro-Russian (Pres.)	Vote Pro-Russian (Parl.)	Post-Maidan Govt. Illegitimate	Trust Putin
Watch Russian TV	0.73*** (0.25)	0.69* (0.29)	0.47*** (0.17)	0.62*** (0.16)
Watch Russian TV × Ukrainian usage	-0.23* (0.11)	-0.12 (0.15)	-0.02 (0.08)	-0.18** (0.06)
Cragg-Donald F-statistic (10% bias cutoff = 13.43)	15.00	15.80	25.00	30.10
Observations	346	341	499	566

Note: Standard errors are clustered by county.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

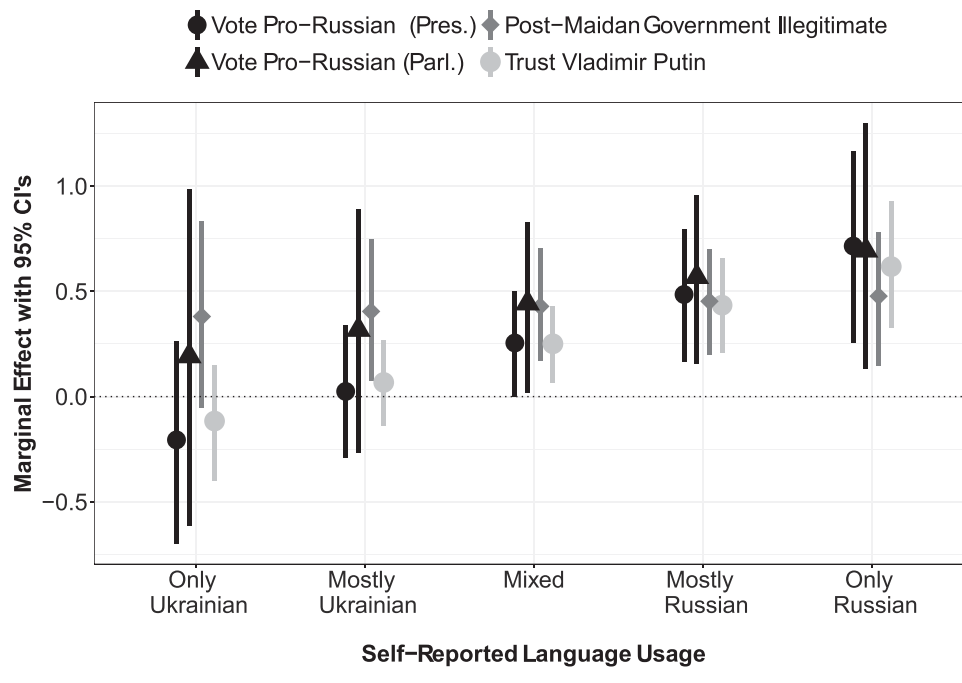
one attitudinal measure (trust in Putin). Also, consistent with earlier precinct-level findings, the effect heterogeneity is weaker in parliamentary than presidential elections, likely because the political environment was more charged and more polarized during the presidential election.

To explore in greater depth how exposure to Russian news affects different types of viewers, we plot in Figure 4 the marginal effects of *Watch Russian TV* for each of the five linguistic categories (with 95% bootstrapped confidence intervals). Among the respondents who speak exclusively in Russian, exposure to Russian news increases the probability of voting for pro-Russian parties and candidates by about 0.7 points, strengthens the belief that the Ukrainian government is illegitimate by about 0.5 points, and increases trust in Putin by about 0.6 points. Consistent with what we found in the precinct-level

analyses, these effects steeply decrease in magnitude among respondents who use less Russian language in their daily interactions. Among those who communicate exclusively in Ukrainian, there are no statistically significant effects of watching Russian news on any of the four outcomes.

Overall, we find evidence across precinct- and individual-level analyses that the effectiveness of biased media varies with consumers' political priors: Those citizens who are more likely to believe the media message *ex ante* are more persuaded to change their beliefs and behaviors as a result of exposure to the message. The fact that the media effect is heterogeneous not only when it comes to aggregate voting (at precinct level) but also at the level of individuals' voting choices and attitudes serves as strong evidence that the heterogeneity that we have

**FIGURE 4 Marginal Effects of Russian Television Consumption by Linguistic Group**



described is driven by differential persuasion rather than differential mobilization. In other words, the evidence suggests that people with different priors are persuaded to behave differently as a result of being exposed to the same biased media message.

Yet, one must be cautious when interpreting the precise nature of the heterogeneous impact of biased media. At the aggregate level, we found that consumers with strongly opposing priors update in the opposite direction to the content of the message. However, the evidence of such backfiring at the individual level is at best weak—there is no statistically significant negative effect of watching news on any pro-Russian behaviors or attitudes among those who speak exclusively in Ukrainian. One possibility is that this indeed indicates that the backfiring effect we have found in the aggregate-level data, and the similar effect reported in Adena et al. (2015), is due to ecological inference error. But it is also possible that the individual-level results suffer from attenuation bias: Ukrainian speakers with pro-Russian preferences might be subject to greater social desirability biases, which could result in a higher measurement error in surveys, and consequently, attenuation of the estimated effects for this population. Resolving this methodologically challenging issue remains an important area for future research.

## Conclusion

The goal of this article was to evaluate how conspicuously biased media impacts mass electoral behavior in a highly polarized political environment. We find consistent evidence that Russian television had a major impact on electoral outcomes in Ukraine by increasing electoral support for pro-Russian political candidates and parties. However, Russian television swayed electoral returns in the pro-Russian direction *on average* by strengthening attitudes of those voters who already had pro-Russian priors rather than by altering the beliefs of pro-Western voters who in fact remained unpersuaded and were probably dissuaded from holding views consistent with the Russian media message. Using original survey data, we have also shown that Russian media did not just mobilize voters with pro-Russian priors but also strengthened their pro-Russian beliefs even further through persuasion by causing political attitudes to shift. The implication of this set of findings is that the aggregate effect of biased media is a product of the distribution of political priors in the population. In the case of Ukraine, where voters were already polarized, exposure to Russian television brought about greater polarization, as expressed through differences in political attitudes and voting.

Some uncertainty remains over the true nature of heterogeneity of biased media effects. In this article, we found strong support both at aggregate and individual levels that a biased media message becomes considerably less effective among consumers whose political priors are contrary to the message's content. However, evidence for the backfiring effect—the notion that biased media dissuades, as opposed to just failing to persuade, consumers with incompatible priors—was found only at the level of aggregate behavioral outcomes and not at the level of individual attitudes and behaviors. Additional research is needed to establish whether the backfiring effect is an artifact of ecological inference or a real phenomenon at the level of individual consumers.

The study of the effectiveness of biased media, especially in a conflictual environment, would also benefit from further attention. For one, the depth of historical relations and linguistic commonalities between Russia and Ukraine might challenge the generalizability of our results. Outside of this context, it might be especially interesting to consider the effectiveness of Russian state-sponsored media, such as the RT television channel or the Sputnik news service, that aims to influence public opinion in developed Western democracies.

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## Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's website:

**Appendix 1:** Sentiment of the Coverage of Ukraine on Russian News

**Appendix 2:** A Model of Heterogenous Information Updating

**Appendix 3:** Classification of Political Parties

**Appendix 4:** Measuring Signal Quality and TV Reception

**Appendix 5:** Survey

**Appendix 6:** Summary Statistics

**Appendix 7:** Additional Balance Tests

**Appendix 8:** Russian Television and Turnout

**Appendix 9:** Calculating Persuasion Rates

**Appendix 10:** Matching-Based Estimates

**Appendix 11:** IV Analyses: Supplementary Results

**Appendix 12:** Double Social Desirability Bias

**Appendix 13:** Effect-Heterogeneity: Additional Results