Making Politics Attractive: Satirical Memes and Attention to Political Information in the New Media Environment

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The impact of humor on political attitudes and behaviors is receiving increased attention. We add to this literature by focusing on the increasingly common but understudied genre of satirical memes. Specifically, we ask whether the presence of memes encourages further consumption of political news; if this effect results from the satirical approach as opposed to the simple presence of visual images; and if such memes are selectively consumed by people who are already politically engaged or also by those who are less engaged. To answer these research questions, we conducted a placebo-controlled online experiment with convenience sampling of undergraduate students, based on a popular alternative news site's posting of news stories accompanied by satirical memes. We found that on average, participants paid more attention to political news when it was accompanied by satirical memes than to news with no or non-satirical visuals. However, this effect was greater for those who were more interested in politics, suggesting that satirical memes may contribute to the knowledge gap between more and less politically aware and interested citizens.

Keywords: political satire, memes, selective exposure, knowledge gap, digital media environment, experiment

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Internet memes have become a prominent feature of participatory media culture (Jenkins, Ford, & Green, 2018) and the digital media environment (Williams & Delli Carpini, 2011). Existing research on political memes focuses on the messages that they transmit and their symbolic meanings (Bayerl & Stoynov, 2016; Ross & Rivers, 2017); the extent to which these meanings are cognitively processed at the individual level (Huntington, 2020); and whether exposure to these messages leads to subsequent outcomes such as discursive participation in political debates (Gal, Shifman, & Kampf, 2016), participation in protest movements (Milner, 2016), or the spread of racist or discriminatory attitudes in social media (Topinka, 2018; Williams, Oliver, Aumer, & Meyers, 2016).

Less studied or understood are the cognitive processes influencing exposure to memes and their subsequent impact on attention to related political information. While several studies have shown how political satire genres generally affect citizens' attention to politics and how this information is cognitively processed (Stroud & Muddiman, 2013), few have focused specifically on memes. Huntington (2020) argues that political memes are subject to biased cognitive processing since individuals rate memes' messages as less effective and scrutinize their argument quality more if they challenge individuals' preexisting views. These limited findings are consistent with selective exposure theory, which argues that people are prone to choose like-minded political messages (Iyengar & Hahn, 2009; Stroud, 2008), thus adding to ideological polarization (Iyengar, Lelkes, Levendusky, Malhotra, & Westwood, 2019).

But is attention to memes also based on one's prior levels of political interest, and if so with what effect on political knowledge gaps (Baum, 2002; Prior, 2007; Tichenor, Donohue, & Olien, 1970)? In theory, memes can contribute to such gaps since they often satirize niche topics that require specific knowledge of politics and recent events to be understood, significant cognitive engagement to be processed, and thus initially high levels of attention to and interest in politics (Pech, 2003). Equally plausible, however, is that memes can increase engagement with politics among the less politically attentive because of the emotional responses and evaluative judgments that they lead to (Street, Inthorn, & Scott, 2013). Since satirical memes as a form of popular culture have become a constitutive part of many social media users' online lives, their use could make politics feel more inclusive and approachable (Shifman, 2014), thus potentially narrowing political knowledge gaps.

In this study, we test the extent to which satirical memes encourage or discourage attention to political information, and for whom. Using theories of selective exposure (Stroud, 2008) and knowledge gap (Tichenor et al., 1970), we argue—and find—that the presence of satirical memes encourages attention to political information but that this effect is greater for politically interested individuals, thus contributing to gaps in political knowledge.

Literature Review

Effects of Political Memes as the Form of Satirical Political Content

Despite the proliferation of memes, there are currently few communication studies that focus on their use and impact (Shifman, 2014). While many scholars refer to "meme" as the term coined by Dawkins (1989), we conceptualize memes as proposed by Shifman (2014) for the purposes of communication

research. Shifman (2014) defines Internet memes as "a group of digital items sharing common characteristics of content, form, and/or stance, which were created with awareness of each other, and were circulated, imitated, and/or transformed via the Internet by many users" (p. 41). These "digital items" take many forms like text, image, video, or hashtag (Milner, 2016; Shifman, 2014).

Satirical memes that address political issues differ from memes in general because of both their form and content. They are similar in their genre to political cartoons that were used years ago in newspapers to ridicule politicians (Huntington, 2016). Political cartoonists have since been replaced by social media users who employ digital media tools and a satirical tone to create image macros to attack politicians or criticize topical issues. Numerous studies show that the tone of political humor is rather aggressive and unflattering toward politics; not memes specifically, but political humor in general frequently assails failures of policies and wrongdoings of public figures (Lee & Kwak, 2014; Young, 2004). Nevertheless, there are also "deadly serious" (Shifman, 2014, p. 120) and "nonsensical" (Katz & Shifman, 2017) memes that substantially differ from satirical ones.

Test (1991) argues that "satire ultimately judges, it asserts that some person, group, or attitude is not what it should be" (p. 5). Gray, Jones, and Thompson (2009) argue that by "stimulating judgment on the memes' object of attack" (p. 12), satire awakens human dignity and practical reason, which makes people think of how institutions and social norms should be organized rather than how they now operate. Hence, political satire could facilitate critical thinking among those who are exposed to such content, which in turn means that satirical memes should be considered a eudaimonic mode of entertainment, "addressing questions which are fundamentally important in life" (Rieger & Klimmt, 2019, p. 2203).

It is also important to clarify what it means for a meme to be political. Wiggins (2019) defines political memes as "a sub-genre of the internet meme and addresses some aspect of political philosophy and ideology" and further emphasizes that "there must be some argument or purpose . . . with regard to a particular political view, how to respond to a political actor or other entity, . . . or simply to accuse political agents of maleficence, corruption, incompetence, etc." (p. 65). Similarly to Wiggins (2019), we define political Internet memes as an image macro meme of a political alongside a character from popular culture or a meme template filled with some politically motivated message to lampoon and undermine the referent political organization.

Whereas memes can take different forms, when it comes to political memes, scholars focus on image macros since they are widely used in political discourse (Ross & Rivers, 2017) and can be easily created using publicly available templates (Nissenbaum & Shifman, 2018). The lack of barriers to the creation and distribution of memes on the Internet has made them one of the most popular forms of user-generated content today (Shifman, 2014), especially in countries where traditional media are censored and the freedom of expression is oppressed (Moreno-Almeida, 2020). Existing research suggests that political memes have been ubiquitously used in political campaigns (Penney, 2017) and mass mobilization political events (Soh, 2020). It was found that memes have the potential to facilitate discursive engagement and political participation of the audience (Shifman, 2014).

Even though satirical memes are limited to only very short messages, if users consume "small doses" of eudaimonic content on a regular basis, they could experience a similar meaningful affect as on consuming inspirational media like movies (Rieger & Klimmt, 2019). Moreover, there is considerable empirical evidence that memes have an appreciable effect on political views and political behavior (Huntington, 2016; Milner, 2016). Memes should no longer be understood as "trivial pieces of pop culture" but a phenomenon that "plays an integral part in some of the defining events of the twenty-first century" (Shifman, 2014, p. 6).

To sum up, for the present experimental study, we conceptualize politically relevant memes as short, visual (usually an image macro) forms of communication that use satire to address political figures, policies, or issues. More broadly, existing research has found that political satire can affect political attitudes and participation, often to a greater degree than such forms of infotainment as daily talk shows. However, there are also several potential drawbacks to the use of satirical memes to communicate political messages, and the literature on selective exposure provides a possible explanation for why this is the case.

Selective Exposure and Attention to Political Information in the Age of Flourishing Visual Content

The existence of so-called confirmation bias—the choice of information predominantly motivated by its match with the existing views of the audience (Lord, Ross, & Lepper, 1979)—is well known. This idea is based on psychological research on cognitive dissonance, which is the discomfort felt in the presence of affectively inconsistent information (Festinger, 1962). With regard to counter-attitudinal political news consumption, this theory is widely used to explain why people often avoid information at odds with their beliefs, ideological attitudes, or political preferences (Garrett, Carnahan, & Lynch, 2013).

The rise of online communication has led to a growth in research on the selective consumption of proattitudinal political information. Stroud (2017) defines selective exposure as "the motivated selection of messages matching one's beliefs or preferences" (p. 532). In other words, this term refers to an observed confirmation bias that causes the selection of pro-attitudinal content (Stroud, 2008). Nevertheless, the concept of selective exposure can also be used to describe any systematic pattern in media use including attention to political information (e.g., Knobloch-Westerwick, 2015). In this study, we draw on this broader definition since, as Johnson, Neo, Heijnen, Smits, and van Veen (2020) explain, it covers a wider set of motivations for media use and can account for cases in which the consumer prefers counter-attitudinal messages.

Various features of online communication may foster or weaken selective exposure, and one of them is the presence of visuals. By "visuals" we refer to images, illustrations, photos, and drawings (Messaris & Abraham, 2001). Their effects on the audience have long been studied in the literature on multimodal political communication (Graber, 1990). Visuals have been proved to affect opinions and behavioral intentions as well as enhance the effects of textual information by increasing the saliency of an issue (Powell, Boomgaarden, De Swert, & de Vreese, 2015). Attention to the visual content can be explained by the simplicity of its consumption. Studies in psychology note that the audience remembers key ideas of visual content much easier than of texts (e.g., Rodriguez & Dimitrova, 2011).

While there is a growing body of literature on the influence of images on the audience's interest in a topic, their attention, and their comprehension, a few studies have focused explicitly on whether images foster or discourage exposure to political information (e.g., Zillmann, Knobloch, & Yu, 2001). For instance, Powell, Hameleers, and van der Meer (2021) found no evidence of using visuals to multimodally frame political news to increase the likelihood of selection. However, Sargent (2007) found earlier that exposure to computer-mediated news stories accompanied by images results in longer self-exposure and that the valence of images might affect selectivity as well. In addition, Keib and colleagues (2018) found variation in the images' effects depending on their content rather than the simple presence of any visual. Hence, in the next subsection, we explore why satirical memes as a form of visual content could have a unique effect on selectivity.

Political Satire, Memes, and Attention to Political Information

There are several explanations of how political satire could undermine or facilitate selective attention to political information. Many studies focus on partisan selectivity and the tendency to select politically like-minded messages. LaMarre, Landreville, and Beam (2009), for instance, argue that political satire could help to overcome the confirmation bias, while Stroud and Muddiman (2013) conclude that watching comedic news makes people more likely to engage in partisan selective exposure. Nevertheless, selective exposure is not limited by political partisanship. Knobloch-Westerwick (2015) notes that media choice happens on various levels and may be driven by various motivations.

The fact that memes might require very niche knowledge of the political issues being satirized and significant cognitive effort to process and understand could enhance selectivity (Pech, 2003). As research in social psychology shows, standpoint-inconsistent information is more difficult and complex to process, so individuals are prone to disregard such content (Ditto & Lopez, 1992). Moreover, in the contemporary high-choice media environment, people can be more selective (Fischer, Jonas, Frey, & Schulz-Hardt, 2005) and ignore such cognitively demanding content (Jang, 2014). Research also shows that the spread of so-called niche news can reinforce selective exposure since niche media "could exacerbate existing divides in the public" by attracting those groups that "are already overrepresented in the political process" (Stroud, 2011, p. 9).

Indeed, political memes might require more cognitive efforts to be processed as compared with non-satirical visuals. As Huntington (2020) says, "A certain level of preexisting knowledge or context is required to fully 'get' the meme" (p. 196). Since recipients of a message cannot always understand the original intentions of its creator (Hall, 1993), general knowledge of the political context is necessary to grasp a meme's message; otherwise, memes can be less effectively perceived or ignored by the audience. The latter can be explained by applying the knowledge gap hypothesis (Moore, 1987; Tichenor et al., 1970). On the one hand, individuals who are less politically educated, not interested in politics, and unaware of political issues might have more difficulty understanding satirical memes' messages and thus avoid them, adding to the larger knowledge gap. On the other hand, satirical memes could decrease the perceived complexity of an issue, as other forms of satirical content do by either evoking emotional response (Chen, Gan, & Sun, 2017; Lee & Kwak, 2014) or demanding less cognitive effort (Ksiazek, Peer, & Lessard, 2016), thus attracting less politically engaged users and helping to reduce gaps in knowledge.

Research Hypotheses

Based on our reading of the research summarized above, we postulate that satirical memes attract people's attention due to a unique combination of hedonic and eudaimonic gratifications related to information seeking. That is, memes give the audience pleasure and make them laugh, thus leading to psychological relaxation and compensating costs of the cognitive load needed to consume sometimes complex political information. This compensatory function is crucial for political memes: In a high-choice media environment, cognitively hard political content may be simply skipped by users if they are not interested in politics. In short, satirical content makes political information attractive regardless of one's prior political interest and, consequently, weakens selective exposure to political information.

H1: Participants spend more time reading the news story when it is accompanied by a satirical meme as compared with a news story without any visuals.

We also argue that the satirical effect is distinct from and greater than the simple inclusion of visuals. Visuals are regularly used to generate more interest in the content (e.g., Keib et al., 2018). However, we posit that the satirical tone, which stimulates judgment on the object of the meme's verbal attack, is the feature of memes that allows them to draw attention to political information. Literature on entertainment media use found that this probably happens because of overlap in hedonic and eudaimonic motivations of media use, where the former is associated with pleasure and relaxation, and the latter presumes that users experience meaningful affect and get insights about the described phenomena (Roth, Weinmann, Schneider, Hopp, & Vorderer, 2014; Weinmann, 2017).

H2: Participants spend more time reading the news story when it is accompanied by a satirical meme as compared with a news story with a non-satirical visual.

However, we expect that memes, which require preexisting knowledge of the agenda to be processed and understood, could widen the knowledge gap between politically interested and aware individuals and less interested/aware individuals due to the cognitive load and specific knowledge that memes require to be processed and understood.

H3: Participants who are interested in politics spend more time reading the news story when it is accompanied by a satirical meme as compared with participants who are not interested in politics.

Method

Participants

We conducted a placebo-controlled online experiment—a way of testing a hypothesis in which, in addition to groups of subjects that receive the treatment to be evaluated, a separate group receives a sham "placebo" treatment, which is specifically designed to have no real effect—using undergraduate and graduate

students from the HSE University, Russia. The experimental design was approved by The Council of Peers at Ronald F. Inglehart Laboratory for Comparative Social Research.

To recruit the participants, in May 2018, we sent invitations via students' study groups' e-mails, which are commonly used in HSE University for communication between lecturers and students. As a result, according to The American Association for Public Opinion Research (AAPOR) standards, response rates could not be computed. We sent 273 invitations to students from three university campuses including Moscow (142), Perm (49), and Nizhniy Novgorod (82). To increase the response rate, we offered participation in a lottery in which the participants could win an Apple Watch (priced at around US\$411 in Russia). In all, 879 students responded to the invitation following the link, and the break-off rate was 29.92%. The number of completed interviews was 616 (N = 616). The participants—83% women and 17% men—were in their early 20s (M = 20.38, SD = 1.29). A detailed description of eligibility criteria, recruitment procedure, and baseline characteristics of the sample are given in Supplementary Materials B.²

Procedure

On entering the online experiment environment based on www.enjoysurvey.com, the participants received a short questionnaire, which can be found in Supplementary Materials K. The CONSORT flow diagram is shown in Supplementary Materials C. Subjects were then randomly assigned to one of three conditions: Control (n = 197), Placebo (n = 200), and Treatment (n = 219). To ensure the effectiveness of randomization, we checked for the covariate balance and put these results in Supplementary Materials D. The p value of the joint orthogonality test indicates that the group differences are insignificant ($\chi^2(22) = 31.67$, p = .083). On average, it took 10.21 minutes to complete the survey.

In each condition, the participants were exposed to a series of political news stories, or as we called it a "news feed," which consisted of six news reports. Before the exposure to news items, participants received the following instructions:

You will see several news reports about the events that have happened in our country and around the world over the last couple of months. We ask you to have a look at them as if you go through news posted on the Internet and social media. Feel free to scrupulously read, skim or skip them by clicking the "Next" button. You have an unlimited amount of time to complete this part of the survey.

The news reports were consecutively shown to the subjects. A schematic of the materials shown to the participants in three different experimental conditions is shown in Figure 1. Each news report included a title and a short text that was around 150 words in length. The order in which news reports were shown was randomized.

² The data underlying the results presented in the study, replication files, and supplementary materials are available from Kirill Chmel's GitHub repository https://github.com/KirillChmel/making-politics-attractive



Figure 1. Schematic of the materials shown to the participants.³

We used a placebo-controlled design of the experiment since it was necessary to manipulate the presence of a satirical meme, that is, to compare exposure with the same piece of news either accompanied by a satirical meme or not as well as to show that the observed effect was not driven by the presence of a non-satirical visual image accompanying a text. Hence, the subjects in the control group were exposed to texts only, while those who were assigned to either the placebo or the treatment group were exposed to the same texts but accompanied by visuals. The placebo group was exposed to a "false" treatment, that is, images that illustrated the content of news reports and did not contain a satirical tone. The treatment group got the same news reports, but they were accompanied by satirical memes that mirrored the content of news reports. Control, placebo, and treatment materials are given in Supplementary Materials E.

Stimuli Materials

We picked memes from the *Lentach* public page on the Russian social media platform Vkontakte. *Lentach* was the first public page in Russia to collect user-generated satirical content and use it to illustrate political and economic news items. Standard image macro and meme templates (e.g., Distracted Boyfriend, Disaster Girl, and Bike Fall) are used there to create a satirical message, which accompanies political news. Now it is one of the most popular public news pages, with 2,312,266 subscribers at the time of writing this article. We decided to avoid using artificially created memes to increase the ecological validity of the study.

We used *Lentach* as the source of stimuli materials since memes, which are posted on this public page, correspond to the conceptualization of the political satirical memes given above. First, these memes

³ This scheme contains images taken from "Rossiyskiy Oppozitsioner Yavlinskiy" (2017) and "Yavlinskiy Bol'she ne Budet" (2018).

are political since they contain arguments with regard to a particular political view, how to respond to political figures (e.g., Vladimir Putin, Natalya Poklonskaya, and Grigory Yavlinsky), political institutions (e.g., the Central Bank of Russia, the Investigative Committee), and policies or politically relevant issues (e.g., elections, anti-terrorism policies, and cryptocurrency regulation). Second, they are satirical in a way that the satirical tone is used to construct a politically motivated message, which verbally attacks or criticizes contemporary political issues or political actors and institutions. We picked memes that used humor, irony, or exaggeration to highlight and condemn failures of political processes and misconduct by public figures.

Dependent Variable

One of the most frequently used approaches to measure selectivity is the use of self-reports, but scholars have a host of reservations about the validity of these measures (see e.g., Hastall & Knobloch-Westerwick, 2013). Using paradata, we used deciseconds (ds) to measure the time spent by the participants on a survey block with the news feed, a.k.a. selective exposure rates. Both the time spent by a participant to become acquainted with each of the six news reports and the total time spent by a participant on the whole news feed were used. We dropped 26 observations identified as outliers and truncated suspicious ones (0.8% of the sample). This procedure is commonly used in reaction time analysis in psychology to increase the precision of the treatment effect (Briggs, 1974; Luce, 1986). Since it was found that data truncation can significantly affect estimates, we replicated our results using the sample before any data manipulations.

We treated observations as outliers if their survey time (Mdn = 7.57 min; interquartile range (IQR) = 4.21 min) was greater than three IQRs, and as suspicious ones if the time spent on each of six news reports exceeded the cut-off of 1.5 IQRs. Assuming that the average adult reading speed is around 160 words per minute (Rubin, 2013), a participant could spend 1 to 3 minutes becoming familiar with a news report. Hence, we truncated selective exposure rates to the value of 3 minutes. Descriptive statistics of the selective exposure rates before and after the application of data truncation are shown in Table 1 (see also Supplementary Materials F).

	Ν	Mean	SD	Max	Truncated			
Report 1	590	238.33 (241.03)	204.08 (228.67)	1800 (2635)	2			
Report 2	590	285.28 (290.02)	262.83 (294.31)	1800 (2642)	5			
Report 3	590	215.13 (215.13)	183.82 (183.82)	1654 (1654)	0			
Report 4	590	201.27 (202.98)	198.47 (214.09)	1800 (2457)	2			
Report 5	590	250.92 (259.71)	247.06 (345.57)	1800 (6038)	4			
Report 6	590	214.36 (224.96)	206.62 (348.50)	1800 (6807)	2			
Overall	590	1405.28 (1433.83)	954.98 (1081.42)	7724 (10096)	_			

 Table 1. Descriptive Statistics of the Selective Exposure Rates Before and After the Application

 of Data Truncation.

Note. Selective exposure rates are measured in deciseconds. Overall is the total time spent by a participant to go through the whole news feed. Descriptive statistics before the data truncation procedure are given in brackets.

Results

Statistical Analysis

To determine whether any of the group means were significantly different from each other we ran a one-way analysis of variance (ANOVA). According to the results shown in Table 2, we found that the differences in selective exposure rates between some of the group means were statistically significant. The differences were most appreciable for the reports 4, 5, and 6 (F(2, 590) = 24.61, p < 100 $.001, \eta^2 = .077; F(2, 590) = 5.79, p < .01, \eta^2 = .019; F(2, 590) = 7.41, p < .001, \eta^2 = .025,$ respectively), while for the report 3, they were statistically significant only at 10% significance level $(F(2, 590) = 2.65, p < .10, \eta^2 = .009)$. On the whole, we found that the group means of the overall time that the participants spent with the news feed were statistically significant (F(2, 590) = 12.21, p < .001, $\eta^2 = .04$). So, we conclude that there is a statistically significant effect of using either satirical memes or visuals in general on selective exposure.

T-P Control Placebo Treatment ANOVA P-C T-C

Table 2. Experimental Group Statistics and Cross-Group Comparisons.

	M (SD)	M (SD)	M (SD)	F(2, 590)	Diff	Diff	Diff
Report 1	215.87	229.04	266.81	3.42*	13.17	50.94*	37.77
	(200.08)	(202.29)	(206.89)				
Report 2	249.99	273.88	327.16	4.62*	23.90	77.17**	53.30
	(209.88)	(276.17)	(287.52)				
Report 3	200.62	203.76	238.36	2.65^{+}	3.14	37.73 ⁺	34.59
	(189.00)	(156.87)	(199.50)				
Report 4	161.58	158.67	275.18	24.61***	-2.90	113.60***	116.50***
	(148.69)	(131.56)	(258.01)				
Report 5	236.42	215.76	295.55	5.79**	-20.67	59.13*	79.80**
	(227.68)	(180.13)	(303.78)				
Report 6	184.67	196.16	257.34	7.41***	11.49	72.67**	61.18**
	(234.59)	(182.88)	(193.45)				
Overall	1249.15	1277.27	1660.39	12.21***	28.12	411.24***	383.12***
	(889.24)	(735.27)	(1123.05)				

Note. Group means and standard deviations (in brackets) are given in the table. Significance levels are at $p^{+} < 0.1$; $p^{+} < 0.05$; $p^{*} < 0.01$; $p^{***} < 0.001$. All tests are two-tailed.

To explore differences between multiple group means and estimate both treatment and placebo effects, we made pair-wise multiple comparisons using a post hoc test. We used the Tukey procedure and specified that five comparisons could produce a family-wise error rate of 0.05. Figure 2 shows that the group mean of overall selective exposure rate was considerably higher in the treatment group (M =1660.39, SD = 1123.05) than in the placebo (M = 1277.27, SD = 735.27) and the control (M = 1249.15, SD = 889.24) ones, and the results of multiple comparisons, which are shown in Table 2, prove that the observed differences were statistically significant ($p_adj = .000$; $p_adj = .000$, accordingly). In other words, the participants in the treatment group spent 41.1 s more than the control group and 38.3 s more than the placebo group to become familiarized with the news feed. We conclude that this effect was driven by the satirical content rather than the presence of any visual as the difference between the control and the placebo group mean values of the overall selective exposure rate was found insignificant $(p_adj = .954)$.



Figure 2. Experimental group means with 95% error bars.

Regression Results

Before we used multilevel models, we ran several ordinary least squares (OLS) models to control for pretreatment covariates and improve the precision of regression estimates of the experimental treatment effect. According to the regression estimates shown in Supplementary Materials G, the average treatment effect (ATE) of the satirical meme use in news reports varied from 41.180 ($\beta = 41.180$, p < .05; Table G2, Model 3) to 105.191 ($\beta = 105.191$, p < .001; Table G2, Model 4). The results are consistent in the sense that ATEs were positive and statistically significant altogether, while the placebo effects were insignificant. Model 1 in Table 3 also proves that if we measure exposure as the time spent on the whole news feed, the effect of the use of satirical memes in news reports is also positive and statistically significant ($\beta = 405.595$, p < .001). Results are robust to the data truncation procedure (see Supplementary Materials G).

We next ran a linear mixed-effects (LME) regression model with a random intercept on selective exposure rates, assuming that the measurement occasions—the selective exposure rates for six news reports—were nested within the subjects (inter-class correlation coefficient (ICC) = 0.424). The model estimates are shown in Table 3, Models 3 and 4.

	OLS		LI	ME
	(1)	(2)	(3)	(4)
Placebo group	26.991	-16.337	4.498	-2.723
	(98.003)	(111.892)	(16.334)	(18.649)
Treatment group	409.595***	397.947***	68.266***	66.325***
	(95.076)	(108.550)	(15.846)	(18.092)
Constant	886.721	890.200	153.015	151.870
	(670.782)	(765.845)	(111.966)	(127.934)
Fixed effects			\checkmark	\checkmark
Random effects: SD (intercept)			139.3***	149.5***
			[127.9; 147.6]	[135.6; 159.7]
N (N obs. / K clusters)	568	568	3408 / 568	3408 / 568
Pretreatment covariates	\checkmark	\checkmark	\checkmark	\checkmark
R ²	0.064	0.052		
Log likelihood			-22561.650***	-23605.150^{***}
F(12; 555)	3.137***	2.514**		

Table 3. OLS and LME Regression Models Estimates.

Note. Dependent variables (DV) are the overall selective exposure rate in Models 1 and 2 and the selective exposure rate by news report in Models 3 and 4. Models 1 and 3 show results for truncated DVs, while Models 2 and 4 are estimated using the original data. Standard errors are given in parentheses for Models 1 and 2. For Models 3 and 4, clustered standard errors at the individual level are given in parentheses. Confidence intervals at 95% for standard deviations of random effects are given in square brackets. Significance levels are at ${}^{\dagger}p < .1$; ${}^{*p} < .05$; ${}^{**p} < .01$; ${}^{***p} < .001$. All tests are two-tailed.

In addition to the statistical advantages of this modeling strategy, there is a substantive one. The definition of selective exposure assumes that selectivity is a common cognitive reaction to cognitive dissonance (Festinger, 1962). However, besides the cognitive aspect of selectivity, there is also an affective response, the magnitude of which varies from subject to subject (Zillmann, Hezel, & Medoff, 1980). We argue that our model explains both mechanisms of information processing. First, fixed regression coefficients represent how the treatment facilitates selectivity averaging across the subjects, so these estimates could represent a cognitive side of selectivity that should be the same for the subjects on average. Second, random regression coefficients represent individual deviations from the average sample effect, so they mirror the idea of affective response.

Multilevel regression results, which are shown in Table 3, Models 3 and 4, confirm that there is evidence of the positive influence of the satirical meme use in news reports on selective exposure. The average treatment effect on selectivity was 68.266 (β = 68.266, p < .001). There was also evidence that the placebo effect was not statistically significant (β = 4.498, p = .172), hence the treatment effect was not driven by the presence of any visual that accompanies a text, but a satirical one. We confirm that the found effects, which were estimated using the original sample, were robust to the data truncation procedure since the statistical significance (p < .001) and the magnitude (β = 66.325) of the treatment effect turned out to

be equal to those that were obtained using the truncated sample (see Table 3, Model 4). Considering affective response and individual-level confounders, we analyzed the best linear unbiased prediction (BLUP) estimates of random effects plotted in Supplementary Materials H. We found an appreciable variation of random effects (SD = 139.25), so the use of random intercept in the model could account for unobserved individual-level confounders and increase the precision of the ATEs.

Attention Check

Another substantive flaw of the measurement strategy that we used is that the more time the subjects spent on the news feed did not necessarily mean that they read its content. To check whether the participants read the texts of news reports indeed, we used several attention-check instruments and asked the subjects to answer four different questions about the content of the news reports shown in the feed. We had four attention checks that tested the participants' attention to the title, the introduction, the main body, and the conclusion of randomly selected news reports. The correct answers were distributed as follows: 87%, 71%, 61%, and 25%, respectively.



Figure 3. The proportion of correct answers by experimental conditions with 95% error bars.

We tested whether the subjects' attention to the news reports' content differed from one group to another (see Figure 3). We found that there were no statistically significant differences between the proportions of correct answers in groups with regard to the participants' attention to the title ($\chi^2(2) = 1.78$, p = .411), and the main body ($\chi^2(2) = 1.14$, p = .567). However, the proportions of correct answers to the

questions about the introduction ($\chi^2(2) = 10.53$, p < .01) and the conclusion ($\chi^2(2) = 9.43$, p < .01) turned out to be significantly different.

Pair-wise comparisons of means revealed that the participants in the treatment group ($\theta = 0.32$) gave appreciably more correct answers ($p_adj = .082$; $p_adj = .024$) on the question regarding the conclusion than those who were in the control ($\theta = 0.22$) and in the placebo ($\theta = 0.20$) groups. Although we assumed that a small percentage of correct answers, in general, might indicate guessing behavior, the participants in the treatment group still performed better than the subjects in two other groups, answering the most complicated question in the given set since the subjects were expected to read texts to the end to answer it correctly.

Knowledge Gap Hypothesis

To test the third hypothesis, we analyzed whether the estimated treatment effect was greater for participants who were already more attentive to and aware of political debates and politics. As measures of respondents' interest in politics and awareness of political agenda, three survey questions were used about the frequency of watching the news (on a 7-point scale from 1 = "once a month" to 7 = "several times a day"; M = 4.96, SD = 1.54), frequency of political discussions (on a 7-point scale from 1 = "once a month" to 7 = "several times a day"; M = 3.45, SD = 1.54), and interest in politics (on a 7-point scale from 1 = "not interested at all" to 7 = "very interested"; M = 3.97, SD = 1.61).

To estimate conditional average treatment effects (CATEs) of the use of satirical memes in news on selective exposure we ran several OLS models with interaction effects (see Table 1), Supplementary Materials I). We did not find statistically significant interaction effects between treatment variables and frequency of watching the news (β = 24.01, p = .692) or frequency of political discussions (β = 42.387, p= .492) though there was some evidence at a 10% significance level that the treatment effect of satirical meme use in the news was higher for participants who were more interested in politics (β = 111.618, p = .058). Figure 3 shows that the effect of satirical meme use gradually increases with the increase in the interest in politics. Moreover, Figure 3 also shows that there were no statistically significant differences among treatment, control, and placebo groups for the participants who were not interested in politics at all; that is, predicted values of the selective exposure rate were essentially the same. We conclude that these findings might serve as support for the third hypothesis that the use of satirical memes in political news has an appreciably greater impact on those who are more interested in politics and generally more politically aware, thus widening the knowledge gap.



Figure 3. Interaction effects plots based on OLS models' estimates.

Discussion

There are three major findings in our study. First, we provide evidence that the presence of satirical memes increases selective attention to political information. Satirical memes make politics attractive to the audience, encouraging them to select and read more cognitively demanding political information. While Cohen's d was small (d = 0.403), we found that the effect was robust to data truncation and model respecification. To the best of our knowledge, this is the first study demonstrating such effects. In addition, the attention checks show that participants in the treatment group also read text bodies more attentively and better memorized their details than others, particularly the question concerning the conclusion—the correct answer to this question indicated that the text body was read until the end. These results suggest that beyond simple attention, satirical memes can increase political learning, though we did not explicitly theorize or test this effect or the mechanism by which it occurs, making it a topic for future research. Our findings show that users tend to consume cognitively hard political content instead of scrolling on if they have a reward. Political memes provide users with this reward, making them laugh and leading to psychological relaxation.

Second, we found that the observed effect of satirical memes on selectivity was not driven by the simple presence of visual images that accompanied the news. The effect size of the use of non-satirical visuals versus texts without images was found negligible (d = 0.034), while the effect size of the use of satirical memes compared with the placebo was small (d = 0.399) but statistically significant. The fact that news accompanied by visuals does not lead to an increase in the audience's attention to information has two implications. In the age of flourishing visual content, the lack of visual representation of information was found to reduce attention and interest in the content (Keib et al., 2018). However, our findings suggest that the presence of simple visuals may no longer be an exceptional, attention-grabbing feature of content, but a new normal. We argue that users may no longer value the presence of any visual, but rather what matters are salient features like the presence of satirical tone implied by the visual.

Third, our results suggest that satirical memes have a greater impact on those who are already more interested in politics, thus potentially widening the knowledge gap between politically aware and unaware citizens. Consequently, the spread of memes might cause a deepening divide between those who are interested in politics and those who are not, a finding consistent with those of Stroud and Muddiman (2013) with respect to the more general effects of political satire. Therefore, our results are in line with the research in which attention to entertainment content is connected with a greater level of political knowledge (Becker & Bode, 2018; Xenos & Becker, 2009). While the effect size of satirical memes on selective attention was relatively small, it was more among those who were interested in politics. Nevertheless, our study is based on a one-time exposure to political memes and is conducted in the artificial, rather than natural environment. In real life, users may consume a variety of memes and other types of entertaining content, which may produce a "spillover effect" (e.g. Ziv, 1988). This effect should be further tested in longitudinal studies to accurately evaluate the spillover mechanism.

Our study contributes to the existing literature on the effects of user-generated political memes that are satirical in their tone (Lee & Kwak, 2014; Nissenbaum & Shifman, 2020) and more broadly to the literature on user-generated satirical content (Ferrari, 2018; Rill & Cardiel, 2013). Nevertheless, professionals and the so-called meme factories become more involved in the processes of creating and spreading memes on the Internet, so the difference in the effects of user-generated forms of political satire and professionally created ones should be further investigated. We also note that the effects that we found were related to satirical political memes, which are the most widely used satire on the Internet, but they cannot be extrapolated to such particular types of memes as serious or silly ones. These effects are conditioned by the satirical rather than memetic aspect of political memes. In other words, we did not test the effect of the memetic way of information spreading, and thus we cannot make any claims about other types of memetic information perception and cognitive elaboration.

In addition to contributing to our understanding of the effects of political satire generally and memes more specifically, we also extend research on the effects of satirical memes to nondemocratic contexts, where existing literature has focused exclusively on the spread of memes under the state control of new media (Moreno-Almeida, 2020) and the censorship of satirical memes (Yang, 2016). Our research contributes to the literature on memes as an instrument for Internet users to grapple with and challenge the dominant discourse of the state (Denisova, 2019; Moreno-Almeida, 2020). While there is a debate about the extent to which satirical content empowers democracy or undermines it in the United States, in Russia, satirical content generated and circulated within leadership-critical publics (Toepfl, 2020) can be genuinely productive. McClennen and Maisel (2014) argue that the appeal of politically productive satire in authoritarian regimes is not cynicism, apathy, and disillusionment in democracy. Rather, its attraction is in speaking to the critical publics' disillusionment with authoritarian propaganda. Notably, Lentach's motto is "the propaganda of common sense" (True Lentach, n.d.), signaling itself as an alternative to the senseless authoritarian propaganda of the state.

This study has several limitations. First, we conducted experimental research in artificial rather than natural conditions. Second, we tested the hypotheses on a student sample, so there was no source of variation to estimate CATEs. Third, given our emphasis on the importance of content, future studies should take into consideration other types of satirical memes. Fourth, our measurement does not allow us to clearly differentiate

between the time spent viewing the satirical meme and the time spent viewing the news story. Finally, our findings need further psychological investigation into how users perceive satirical political content and to what extent its humorous character compensates for the complexity of elaborated information.

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