CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE

Measuring the Effects of Influence Operations: Key Findings and Gaps From Empirical Research

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Combating influence operations is a major priority of governments, tech platforms, and civil society organizations around the world.[1] Yet policymakers lack good information about the nature of the problem they seek to solve. Empirical research on how influence operations can affect people and societies—for example, by altering beliefs, changing voting behavior, or inspiring political violence—is limited and scattered. This makes it difficult for policymakers to prioritize influence threats, judge whether the problem is getting better or worse, and develop evidence-based solutions.

To assess what is known about the effects of influence operations and identify remaining research gaps, the Partnership for Countering Influence Operations sponsored a systematic literature review by Princeton University's Empirical Studies of Conflict Project. Laura Courchesne, Jacob N. Shapiro, and Isra M. Thange examined eighty-two studies published between 1995 and 2020.[2] The review included only those studies that (1) examined a specific population targeted by an influence operation, (2) compared measurable outcomes (behaviors or beliefs) of people exposed versus those who were not, and (3) met minimum standards of statistical credibility. The selected studies covered multiple forms of influence operations—mainly political disinformation, state propaganda, and health misinformation.

The literature demonstrates that certain kinds of influence operations can have measurable effects on people's beliefs and behavior. But we still lack answers to fundamental questions, like whether and how social media–based operations differ from traditional forms of influence.

Key Insights

The strongest findings cluster in two areas: long-term exposure (lasting between four and thirty years) via traditional mass media, and short-term exposure (lasting days) via social media. Both types of exposure can measurably affect the beliefs or behavior of targeted populations.

Long-Term Mass Media Operations

Multiple studies showed that long-term influence operations using pre-internet media such as newspapers, radio, and television can be successful at causing voters to support a particular political party.[3] For example, populations in Ukraine and Taiwan appeared more likely to vote for pro-Russian or China-endorsed candidates, respectively, after repeated exposure to foreign-supported television channels.[4] A separate study of Americans exposed to negative images of Ukraine by Russian media found this exposure decreased approval and perceptions of Ukraine by 10 percent.[5]

Long-term mass media campaigns have also affected the behavior of those people exposed to them. In particular, several studies have shown that targeted information operations can lead to increased political violence in settings of conflict or civil unrest.[6] For example, mass media exposure to strong Nazi propaganda over many years was found to increase German soldiers' risk-taking during World War II combat.[7]

Short-Term Social Media Operations

Another set of studies examined the short-term effects of social media–based influence operations. Some of the studied operations caused shifts in political beliefs and behavior, increased xenophobic or discriminatory sentiments, and increased skepticism and uncertainty around vaccines and medical information.[8] Such findings are consistent with an earlier body of research on political advertising, which generally has "persuasive but short-lived influence on citizens."[9]

Social media operations can affect more than just beliefs. Short-term shifts in social media activity by extremely prominent actors—Germany's far-right AfD party, for example—can also have modest, statistically detectable impacts on racially motivated violence in a given area.[10]

Key Gaps

While the existing literature provides important insights, it also has significant gaps. On the whole, empirical research does not yet adequately answer many of the most pressing questions facing policymakers.

Medium of Influence

A vast majority of these studies (74 percent) examined the effects of influence operations carried out through traditional mass media. While traditional mass media remain important channels for influence operations, such studies do not directly address the role of the internet and social media, the primary focuses of many policymakers. More research is needed to learn whether online influence operations have different effects than their off-line counterparts—for example, due to the increased role of social networks and algorithms.

Only twenty-one of the eighty-two studies examined influence operations on social media. Of these, fourteen focused solely on Facebook or Twitter. The two platforms have outsized importance in the Western world and a documented history of influence operations. But the same is true of YouTube and Instagram, which have received far less attention from researchers.

The predominant focus on two major Western platforms means there has been little study of platforms popular in other parts of the world. It also means that we cannot compare how the effects of influence operations may vary based on a platform's size, function, architecture, or algorithms. Further, none of the studies included in the review examined cross-platform or multi-platform influence operations. Yet experts see all of these aspects as important focus areas for policymakers.[11]

Only one study in this review examined what has arguably been the greatest focus of policymakers since 2016: the threat of foreign governments using social media to sway voters in democratic elections. The study, examining efforts by Russia's Internet Research Agency during the 2016 U.S. presidential election, found no effect on the beliefs of American Twitter users.[12] The dearth of studies in this area, and their limited findings so far, suggest major disconnects between how policymakers and the research community perceive this threat.

Time Horizon

Most studies in this review examined long-term exposure (years) or short-term exposure (days) to influence operations, but no study evaluated impacts over months or weeks. In particular, short-term studies often lacked follow-up observations necessary to gauge the continued duration of an influence operation's initial effect.

This research gap is significant because many policy interventions have focused on the weeks and months immediately surrounding a sensitive event. For example, U.S. Cyber Command reportedly disrupted Russia's Internet Research Agency around the time of the 2018 midterm elections, and major social

media platforms instituted many new policies and product design tweaks in the months before and after the 2020 U.S. election.[13] We do not currently know whether influence operations are effective on the same time scale that these policies operate.

Influence Tactics

No study in this review directly tested for potential variations in effectiveness between different influence operations tactics. For example, there has been substantial work on how automated social media "bots" can impact those people exposed to them, but it is unclear how so-called bot tactics compare to other tactics that might also be available to influence operators. Such research could reveal the relative cost-effectiveness of influence operations tactics and thus help shape efforts to deter or disrupt bad actors.

Targeted Country

The eighty-two studies covered a wide range of countries, including Argentina, Austria, Brazil, Chile, China, Croatia, Germany, India, Indonesia, Italy, Mali, Mexico, Netherlands, Nigeria, Norway, Poland, Russia, Rwanda, Spain, Taiwan, Uganda, Ukraine, the United Kingdom, and the United States.

That said, studies involving U.S.-based populations constituted 27 percent of the total. Moreover, studies of foreign government–sponsored political influence operations have focused almost entirely on Russian campaigns, despite that more than twenty other countries have a proven capacity to conduct such operations.[14] To help inform policy on an international and global scale, research should examine a broader range of victim and perpetrator countries.[15]

Looking Ahead

The good news is that the research community is moving swiftly to address many of these gaps. As figure 1 demonstrates, there has been a dramatic increase since 2016 in the number of studies meeting our selection criteria—about 60 percent were published in the last two years alone. The COVID-19 "infodemic" has further catalyzed research; roughly one-fifth of the 2020 studies dealt with pandemic misinformation.

Still, the research gaps are serious and long-standing. There are inherent difficulties in establishing causality and in accounting for complex factors like cultural and political context when measuring influence operations effects. Filling key gaps will likely take many years and substantial investments by a range of institutions to empower researchers. Today, researchers often struggle to access important data held by third parties, such as platforms and governments. They also face inadequate funding, misaligned professional incentives, disciplinary silos, and nonstandard terms and methodologies.[16]

In the long run, new models of research collaboration will be needed to address these barriers and enable better measurement of influence operations effects.[17] Multi-stakeholder collaboration would leverage the unique strengths of industry, academia, and government. Such collaborations can generate the evidence needed to support society's response to challenges in the information environment.

Effects of Influence Operations

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
A 61-million-person experiment in social influence and political mobilization	Robert M. Bond, Christopher J. Fariss, Jason J. Jones, Adam D. I. Kramer, Cameron Marlow, Jaime E. Settle & James H. Fowler	2012	Variation in exposure to a message on Facebook: either encouragement to vote with some profile pictures of friends who had voted, encouragement to vote without the profile pictures of friends who had voted, or no message	(1) "Self-reported voting," measured through "clicking the I Voted button," (2) "desire to seek information about the election," measured through "clicking the polling-place link," and (3) "voting in the election"	Researcher manipulated "randomized controlled trial" where "users were randomly assigned to a 'social message' group, an 'informational message' group or a control group"	"All users of at least 18 years of age in the United States who accessed the Facebook website on 2 November 2010"

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
A spatial analysis of the impact of West German television on protest mobilization during the East German revolution	Charles Crabtree, David Darmofal, Holger L Kern	2015	Exposure to West German television	"The probability of protest events occurring," with data gathered through a "micro-level dataset of more than 2,700 protest events that took place between September 1989 and March 1990"	Variation arising from the fact that "West German television broadcasts could be received in most but not all parts of East Germany"	"2,734 county-level protest events between 4 September 1989 and 18 March 1990, the date of the first free election in East Germany."

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
A Tear in the Iron Curtain: The Impact of Western Television on Consumption Behavior	Leonardo Bursztyn and Davide Cantoni	2014	"Differential access to West German television broadcasting in East Germany... during the communist era," calculated based on a "signal propagation model"	"Differences in private consumption" in "the period immediately following the German reunification of 1990," based on data from "the first two waves of the German income and expenditure survey (EVS) collected after 1990"	Variation in access to West German television in some East German regions that "were either too distant from the Western border or West Berlin, or located in valleys behind mountains that would block TV broadcasting signals"	Residents of East Germany

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
Assessing the Russian Internet Research Agency's impact on the political attitudes and behaviors of American Twitter users in late 2017	Christopher A. Bail, Brian Guay, Emily Maloney, Aidan Combs, D. Sunshine Hillygus, Friedolin Merhout, Deen Freelon, and Alexander Volfovsky	2019	"Interaction with [Russian Internet Research Agency] accounts," measured through "a binary indicator of whether respondents interacted with IRA accounts between the 1st and 2nd survey"	"Individual-level changes in political attitudes and behaviors over time," measured using survey records of "political attitudes measured preinteraction and postinteraction"	"Whether or not the respondent interacted with an IRA account prior to the 1st survey conducted by Bail et al. in October 2017 by mentioning, retweeting, liking, or following an IRA account or liking a tweet that mentions an IRA account"	"1,239 Republican and Democratic Twitter users from late 2017"

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
Asymmetrical perceptions of partisan political bots	Harry Yaojun Yan, Kai-Cheng Yang, Filippo Menczer, and James Shanahan	2020	(1) "Time of deliberation," (2) "Perceived uncertainty," (3) "Twitter activity and behaviors," (4) "Existing knowledge," (5) "Previous encounters of bots," (6) "Self-efficacy in recognizing bots," and (7) "Demographics" or partisanship	Ability of the subject to accurately identify whether the account they just interacted with was a bot, measured through four answers to a question that asked that, ranging from “definitely a bot,” “likely a bot,” “likely a human,” and “definitely a human.” Accuracy is measured as "a percentage of correct answers and an odds ratio"	Naturally occurring variations in the study's subjects	656 US residents

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
Bias in Cable News: Persuasion and Polarization	Gregory J. Martin and Ali Yurukoglu	2017	Variation in exposure to "slanted news"	Voting decisions, based on "precinct-level voting data from the 2008 Presidential election" and NAES "data from the 2000, 2004, and 2008 election cycles"		American cable news viewers

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
					"Cable channel positions" are used "as exogenous shifters of cable news viewership" because they "do not correlate with demographics that predict viewership and voting, nor with local satellite viewership"	

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
Brief Exposure to Misinformation Can Lead to Long-Term False Memories	Bi Zhu, Chuansheng Chen, Elizabeth F. Loftus, Qinghua He, Chunhui Chen, Xuemei Lei, Chongde Lin, and Qi Dong	2013	Visual exposure to two different 50-slide "stories" with two versions of 12 "critical information" or misinformation slides, and exposure to narrations of those stories, including 38 true statements and 12 statements containing misinformation	Amount of false memories arising from misinformation exposure that persisted, measured through "endorsement rates" 1.5 years after the initial study	Two different versions of each of the 12 "critical event" slides were created by the researchers	342 adults

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
Can Television Bring Down a Dictator? Evidence from Chile's "No" Campaign	Felipe Gonzalez and Mounu Prem	2017	"Television exposure, "measured through "the percentage of households with television"	(1) Stock prices, and (2) "Voting behavior," measured through "the opposition's vote share in [a] county"	"Differential television exposure of counties while controlling for unobserved heterogeneity in political preferences – derived from voting behavior in the 1970 presidential election – and other predetermined characteristics"	146 counties in Chile

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Can Television Reduce Xeno-phobia? The Case of East Germany	Lars Hornuf, Marc Oliver Rieger, Sven Hartmann	2020	Exposure to West German television, based on "the fact that West German channels exposed their audience more frequently to foreigners and foreign countries than East German channels"	"Xenophobia and election outcomes of nationalist parties in East Germany"	"The exogenous variation in the geographic features of East Germany, that provided differential access to West German television"	Residents of counties in East Germany, with counties with access to West German TV serving as the treatment group, and those without access serving as the control group

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
Capturing the Airwaves, Capturing the Nation? A Field Experiment on State-Run Media Effects in the Wake of a Coup	Jaimie Bleck and Kristin Michelitch	2017	Variation in "exposure to national public radio (ORTM)"	(1) "National identity and attitudinal consistency with the junta's broadcasting," (2) "acceptance of the ethnic group championed by the secessionists," measured through "whether the respondent would allow his or her child to marry a Tuareg," (3) "junta influence on political opinions," through questions on when they would like to hold elections and their satisfaction	"Randomly selected women and nonelite men were invited to become "custodians" of a solar, crank radio" in 5 villages with only ORTM access, while 5 otherwise-similar villages were not given a radio	10 villages in Mali

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
Cognitive and affective responses to political disinformation in Facebook	Arash Barfar	2019	Exposure to political misinformation versus true news via Facebook posts from popular pages	"Cognitive and affective responses that political disinformation prompted in Facebook," measured through the anger, anxiety, incivility, and analytical content of comments on "2,100 political posts from popular sources in Facebook"	Differences in exposure to political misinformation versus true news via Facebook posts from popular pages	Users that commented on "2,100 political posts from popular sources in Facebook"

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample

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Cross-Border Media and Nationalism: Evidence from Serbian Radio in Croatia	Stefano DellaVigna, Ruben Enikolopov, Vera Mironova, Maria Petrova, Ekaterina Zhuravskaya	2014	Exposure to Serbian radio while living in the border region of Croatia	Vote shares for the extreme nationalist parties (HSP, HP-HPP, and HCSP), for the moderate nationalist parties (HDZ), and for the main party without nationalistic ideology (SDP), in Croatia	Variation in the availability of Serbian radio among different villages in the border region of Croatia	Residents of 139 Croatian "villages in the region adjacent to the Serbian border"

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
Demonizing the enemy: the influence of Russian state-sponsored media on American audiences	Aleksandr Fisher	2020	Exposure "to an article from Russia Today (RT)... criticizing the Ukrainian government," and assignment to one of four experimental conditions	(1) "How exposure to negative information – with and without the message source – influences favorability toward Ukraine, Ukraine's foreign policy, and its president," (2) "whether citizens draw pro-Russian policy conclusions following exposure to Russian propaganda, assessing their attitudes toward expanding sanctions on Russia and arming the Ukrainian government" on a five point scale	Researcher induced variation in "whether audiences are aware of the message source, and/ or the intentions, of the Russian-funded network"	"895 participants" recruited through TurkPrime

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
Digital propaganda, political bots and polarized politics in India	Taberez Ahmed Neyazi	2019	Exposure to political bots on Twitter "in the wake of the Uri Attack" in Kashmir in 2016 and "the subsequent Surgical Strike"	"Twitter public opinion" on "two international conflicts between India and Pakistan," measured through Twitter data	Bot activity promoting various hashtags and messages on Twitter	Tweets and hashtags colleced from Social Bearing after the Uri Attack and Surgical Strike

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample

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Do Television and Radio Destroy Social Capital? Evidence from Indonesian Villages	Benjamin Olken	2009	Exposure to television and radio in Indonesia	"Impacts on social capital," as measured through (1) "participation in social groups," (2) "trust"		Residents of over "over 600 villages in East and Central Java"

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
					"Use[s] two sources of variation in signal reception—one based on Indonesia's mountainous terrain, and a second based on the differential introduction of private television throughout Indonesia"	
		2020				

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
E… Does emotional or repeated misinformation increase memory distortion for a trauma analogue event?	Sasha Nathan, Deryn Strange, and Melanie K. T. Takarangi		Exposure to a traumatic film with removed scenes, followed by exposure to differing numbers (zero, one, or three) of reports describing the removed scenes	"Memory distortion," measured through participants' memories of the removed scenes	Experimentally manipulated by the researcher, to expose participants to zero, one, or three reports with misinformation that described scenes that did not take place in the original film shown to participants	Amazon Mechanical Turk workers

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Drifting Further Apart? How Exposure to Media Portrayals of Muslims Affects Attitude Polarization	Desirée Schmuck, Raffael Heiss, and Jörg Matthes	2020	Variation in exposure to positive versus negative information about Muslims, as well as in congruent versus incongruent negative information about Muslims	"Attitudes toward Muslim immigration," measured on a 7-point Likert scale	Variation in "positive and negative portrayals of Muslims in traditional media outlets and on social networking sites"	764 people representative of the Austrian population in 2017

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Electoral Effects of Biased Media: Russian Television in Ukraine	Leonid Peisakhin and Arturas Rozenas	2018	Differential "availability of Russian television" in different areas of the Ukrainian provinces studied, based on signal strength and reception data revealing "the probability that a precinct receives Russian analog television"	"Electoral behavior in Ukraine" in the 2014 national elections, based on "precinct-level data... from the Central Election Commission of Ukraine"	Large amounts of variation in "signal quality" between the areas studied	1,676 respondents from "electoral precincts in three provinces... of northeastern Ukraine: Chernihiv, Sumy, and Kharkiv"

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
Erasing Ethnicity? Propaganda, Nation Building, and Identity in Rwanda	Arthur Blouin and Sharun W. Mukand	2019	"Variation in exposure to the government's radio propaganda," measured through "village-level variation in reception of the government-owned/operated Radio Rwanda"	(1) The "measure of ethnic salience" through the Salience of Identity Test (SIT), (2) the ethnicity chosen to partner with in a "cooperative face-to-face interaction," (3) "interethnic trust" measured through a survey, and (4) "behavior in a trust game"	"The mountainous topography of Rwanda" creates a naturally occurring "variation in exposure to the government's radio propaganda"	"438 subjects in 52 villages in rural Rwanda"

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
Evaluating the Impact of a National AIDS Prevention Radio Campaign in St. Vincent and the Grenadines	Susan E. Middlestadt, Martin Fishbein, Dolores Albarracin, Claudette Francis, M. Ann Eustace, Michael Helquist, and Anton Schneider	1995	Exposure to a "three-nation, mass media, condom use campaign," based on the self-reported exposure of respondents	A myriad of belief-related and behavioral outcomes measured through survey responses, such as (1) "Awareness of the AIDS Hotline," "Impact on Perceived Control" or protection from AIDS, (3) "Impact on Communication and Communication Belief," (4) "Impact on Perceived Norms," (5) "Impact on Beliefs About and Attitudes Toward Condom Use," and (6) "Intentions to Use Condoms"	Respondents were either exposed or not exposed to the radio campaign	"297 respondents (109 teens, 102 parents of teens, and 86 other adults)" from St. Vincent

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
Exposure to hate speech increases prejudice through desensitization	Wiktor Soral, Michał Bilewicz, and Mikołaj Winiewski	2017	Exposure to "a list of pre-selected examples of hate speech directed against refugees and Muslims"		Researcher manipulated	"682 adolescent Poles"

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
				(1) Sensitivity to hate speech, measured based on subjects' ratings of whether they found the hate speech offensive or not, (2) sensitivity to social norms, measured on a 7-point scale ranking responses of "social acceptability" in response to a short scenario, (3) outgroup prejudice, measured through the Social Distance Scale, (4) anti-immigrant attitudes, measured through a 7-point scale asking about support for refugee policies relating to violence and isolation		

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
	Andy S. L. Tan, Chul-joo Lee, and Jiyoung Chae	2017	"Exposure to health misinformation about 4 cancer-related risk factors (indoor tanning, e-cigarette use, reusing plastic bottles, and artificial sweeteners)"	(1) "Beliefs," measured through a 4-point scale agreeing or disagreeing with a health point, (2) "Intentions," measured through a 5-point scale asking about one health topic, and (3) "Behaviors"	Researchers manipulated exposure to misinformation	Undergraduate students

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
Exposure to Health (Mis)Information: Lagged Effects on Young Adults' Health Behaviors and Potential Pathways						

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
Exposure to opposing views on social media can increase political polarization	Christopher A. Bail, Lisa P. Argyle, Taylor W. Brown, John P. Bumpus, Haohan Chen, M. B. Fallin Hunzaker, Jaemin Lee, Marcus Mann, Friedolin Merhout, and Alexander Volfovsky	2018	Exposure to a Twitter bot with "opposing political ideologies," achieved through randomly offering participants "$11 to follow a Twitter bot" that "retweeted messages randomly sampled from a list of 4,176 political Twitter accounts"	"Change in political ideology during the study period measured via a 10-item survey instrument that asked respondents to agree or disagree with a range of statements about policy issues on a seven-point scale"	Random assignment to a treatment condition in which respondents "were offered financial incentives to follow a Twitter bot for 1 month that exposed them to messages from those with opposing political ideologies"	1,652 "Democrats and Republicans who visit Twitter at least three times each week"

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample

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Fanning the Flames of Hate: Social Media and Hate Crime	Karsten Müller and Carlo Schwarz	2018	Exposure to "right-wing anti-refugee sentiment on Facebook," collected using Facebook Graph API and the AfD Facebook page	"Violent crimes against refugees," measured through "the number of incidents targeting refugees"	Matching similar municipalities with differing levels of social media usage, exploiting "weekly variation in posts about refugees," and "exploit[ing] exogenous variation in major internet and Facebook outages"	"German municipalities"

Title	Author	Year	Treatment (Independent Variable)	Outcome (Dependent Variable)	Source of Variation	Study Sample
Foreign Media and Protest Diffusion in Authoritarian Regimes: The Case of the 1989 East German Revolution	Holger Lutz Kern	2010	Variation in exposure to West German television, measured through matching "East German counties that differ, to the greatest extent possible, in their level of access to WGTV while being as similar as possible in terms of their background characteristics"	The "Rate of Diffusion" and "Depth of Diffusion" of protests in a given county	Naturally occuring variation resulting from "the fact that West German television broadcasts could be received in most but not all parts of East Germany," and matching otherwise similar counties into pairs with one having access to West German television and the other not having access	"East German counties" and a survey of "1,631 East German college students"

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Notes

[1] Victoria Smith, "Mapping Worldwide Initiatives to Counter Influence Operations," Carnegie Endowment for International Peace, December 14, 2020, https://carnegieendowment.org/2020/12/14/mapping-worldwide-initiatives-to-counter-influence-operations-pub-83435.

[2] While the reviewed studies were all published between 1995 and 2020, some examined influence operations that took place much earlier.

[3] Leonid Peisakhin and Arturas Rozenas, "Electoral Effects of Biased Media: Russian Television in Ukraine," *American Journal of Political Science* 62, no. 3 (2018): 535–550; and Stefano DellaVigna and Ethan Kaplan, "The Fox News Effect: Media Bias and Voting," *Quarterly Journal of Economics* 122, no. 3 (2007): 1187–1234.

[4] Peisakhin and Rozenas, "Electoral Effects of Biased Media"; and Jay C. Kao, "How the Pro-Beijing Media Influences Voters: Evidence From a Field Experiment," University of Texas at Austin, December 2020, https://www.jaykao.com/uploads/8/0/4/1/80414216/pro-beijing_media_experiment_kao.pdf. In the case of Taiwan, however, a backfire effect was reported if the targeted audience had a preexisting negative view of China or perceived the outlet as associated with the Chinese government.

[5] Aleksandr Fisher, "Demonizing the Enemy: The Influence of Russian State-Sponsored Media on American Audiences," *Post-Soviet Affairs* 36, no. 4 (2020): 281–296.

[6] David Yanagizawa-Drott, "Propaganda and Conflict: Evidence From the Rwandan Genocide," *Quarterly Journal of Economics* 129, no. 4 (2014): 1947–1994; and Maja Adena, Ruben Enikolopov, Maria Petrova, Veronica Santarosa, and Ekaterina Zhuravskaya, "Radio and the Rise of the Nazis in Prewar Germany," *Quarterly Journal of Economics* 130, no. 4 (2015): 1885–1939.

[7] Benjamin Barber IV and Charles Miller, "Propaganda and Combat Motivation: Radio Broadcasts and German Soldiers' Performance in World War II," *World Politics* 71, no. 3 (2019): 457–502.

[8] Christopher A. Bail, Lisa P. Argyle, Taylor W. Brown, John P. Bumpus, Haohan Chen, M. B. Fallin Hunzaker, Jaemin Lee, Marcus Mann, Friedolin Merhout, and Alexander Volfovsky, "Exposure to Opposing Views on Social Media Can Increase Political Polarization," *Proceedings of the National Academy of Sciences* 115, no. 37 (2018): 9216–9221; Ruben Enikolopov, Alexey Makarin, and Maria Petrova, "Social Media and Protest Participation: Evidence From Russia," *Econometrica* 88, no. 4 (2020): 1479–1514; Holger Lutz Kern, "Foreign Media and Protest Diffusion in Authoritarian Regimes: The Case of the 1989 East German Revolution," *Journal of Psychoeducational Assessment* 44, no. 9 (2011): 265–72, https://doi.org/10.1177/0734282913508620; Matthew L. Williams, Pete Burnap, Amir Javed, Han Liu, and Sefa Ozalp, "Hate in the Machine: Anti-Black and Anti-Muslim Social Media Posts as Predictors of Offline Racially and Religiously Aggravated Crime," *British Journal of Criminology* 60, no. 1 (2020): 93–117; Leonardo Bursztyn, Georgy Egorov, Ruben Enikolopov, and Maria Petrova, "Social Media and Xenophobia: Evidence From Russia," no. w26567, National Bureau of Economic Research, December 2019, https://www.nber.org/papers/w26567; and Man-pui Sally Chan, Kathleen Hall Jamieson, and Dolores Albarracin, "Prospective Associations of Regional Social Media Messages With Attitudes and Actual Vaccination: A Big Data and Survey Study of the Influenza Vaccine in the United States," *Vaccine* 38, no. 40 (2020): 6236–6247.

[9] Matthew P. Motta, and Erika Franklin Fowler, "The Content and Effect of Political Advertising in U.S. Campaigns," in Oxford Research Encyclopedia of Politics, December 22, 2016, https://oxfordre.com/politics/view/10.1093/acrefore/9780190228637.001.0001/acrefore-9780190228637-e-217.

[10] Karsten Müller, and Carlo Schwarz, "Fanning the Flames of Hate: Social Media and Hate Crime," *Journal of the European Economic Association*, October 30, 2020, https://academic.oup.com/jeea/advance-article-abstract/doi/10.1093/jeea/jvaa045/5917396?redirectedFrom=fulltext.

[11] Victoria Smith and Natalie Thompson, "Survey on Countering Influence Operations Highlights Steep Challenges, Great Opportunities," Carnegie Endowment for International Peace, December 7, 2020, https://carnegieendowment.org/2020/12/07/survey-on-countering-influence-operations-highlights-steep-challenges-great-opportunities-pub-83370; and Ben Nimmo, "The Breakout Scale: Measuring the Impact of Influence Operations," Brookings Institution, September 2020, https://www.brookings.edu/research/the-breakout-scale-measuring-the-impact-of-influence-operations/.

[12] Christopher A. Bail, Brian Guay, Emily Maloney, Aidan Combs, D. Sunshine Hillygus, et al., "Assessing the Russian Internet Research Agency's Impact on the Political Attitudes and Behaviors of American Twitter Users in Late 2017," *Proceedings of the National Academy of Sciences* 117, no. 1 (2020): 243–250.

[13] Ellen Nakashima, "U.S. Cyber Command Operation Disrupted Internet Access of Russian Troll Factory on Day of 2018 Midterms," *Washington Post*, February 27, 2019, https://www.washingtonpost.com/world/national-security/us-cyber-command-operation-disrupted-internet-access-of-russian-troll-factory-on-day-of-2018-midterms/2019/02/26/1827fc9e-36d6-11e9-af5b-b51b7ff322e9_story.html; and Kamya Yadav, "Platform Interventions: How Social Media Counters Influence Operations," Carnegie Endowment for International Peace, January 25, 2021, https://carnegieendowment.org/2021/01/25/platform-interventions-how-social-media-counters-influence-operations-pub-83698.

[14] Diego A. Martin, Jacob N. Shapiro, and Julia Ilhardt, "Trends in Online Foreign Influence Efforts," Version 2.0, Princeton University, August 5, 2020, https://drive.google.com/file/d/18QIENHZslNIoKvOu72iEjG6RgWL1Dww_/view.

[15] Vishnu Kannan, Carissa Goodwin, and Brawley Benson, "Community Perspectives on Diversity in the Countering Influence Operations Field," Carnegie Endowment for International Peace, March 30, 2021, https://carnegieendowment.org/2021/03/30/community-perspectives-on-diversity-in-countering-influence-operations-field-pub-84198.

[16] Victoria Smith and Natalie Thompson, "Survey on Countering Influence Operations Highlights Steep Challenges, Great Opportunities," Carnegie Endowment for International Peace, December 7, 2020, https://carnegieendowment.org/2020/12/07/survey-on-countering-influence-operations-highlights-steep-challenges-great-opportunities-pub-83370.

[17] Jacob N. Shapiro, Natalie Thompson, and Alicia Wanless, "Research Collaboration on Influence Operations Between Industry and Academia: A Way Forward," Carnegie Endowment for International Peace, December 3, 2020, https://carnegieendowment.org/2020/12/03/research-collaboration-on-influence-operations-between-industry-and-academia-way-forward-pub-83332.
