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Fake news: the effects of social media disinformation on domestic terrorism

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ABSTRACT
This study tests whether social media disinformation contributes to domestic terrorism within countries. I theorize that disinformation disseminated by political actors online through social media heightens political polarization within countries and that this, in turn, produces an environment where domestic terrorism is more likely to occur. I test this theory using data from more than 150 countries for the period 2000–2017. I find that propagation of disinformation through social media drives domestic terrorism. Using mediation tests I also verify that disinformation disseminated through social media increases domestic terrorism by, among other processes, enhancing political polarization within society.

On 14 December 2016 Edgar Maddison Welch walked into the Comet Ping Pong pizzeria in Washington, D.C. Once inside he brandished an AR-15 semiautomatic rifle and searched the restaurant before making his way back to the kitchen where he fired a shot through a lock on a closet. Though the incident terrified patrons and staff, it produced no casualties. Welch, who later surrendered to police without further incident, claimed that he had come to Comet Ping Pong from his home in North Carolina to “self-investigate” [sic] information he had uncovered online that the restaurant was a front used by Democratic Party operatives for human trafficking and the sexual abuse of children.

During the 2016 U.S. Presidential Election season a bizarre conspiracy theory had made its way through the circuits of alt-right websites and social media communities. Dubbed “Pizzagate,” the conspiracy theory held that hacked emails from the Clinton campaign that were published by WikiLeaks contained coded messages regarding a clandestine human trafficking and child sex ring controlled by prominent Democratic Party operatives and run through D.C. restaurants like Comet Ping Pong. Pizzagate received prominent attention on alt-right and right-wing extremist websites such as InfoWars, Planet Free Will, The Vigilant Citizen, SubjectPolitics.com and Your News Wire. Participants in social media communities on 4chan, 8chan and Twitter further spread the conspiracy theory throughout the fall of 2016. The members of the online Reddit community The_Donald constructed a subreddit dedicated to further developing and more broadly disseminating Pizzagate (Robb, 2017; Sebastian, 2016).
Welch confirmed to authorities that he was motivated to commit the armed attack on Comet Ping Pong after spending several days following the Pizzagate conspiracy online and had tried, unsuccessfully, to enlist friends and confederates in his attack. His stated objective in launching the attack was to rescue children he had read had been abducted and were being held at the pizzeria and to expose to the wider public a nefarious plot by Democratic Party members. After his arrest, Welch expressed regret for his conduct during the attack in an interview with the New York Times. However, he continued to express belief in Pizzagate and refused to regard it as “fake news (Goldman, 2016)” Moreover, the conspiracy theory continued to be perpetuated online with some adherents arguing that Welch’s shooting itself was a “false flag operation” intended to distract public attention away from the conspiracy (Menegus, 2016). Comet Ping Pong, along with other establishments in the Washington, D.C. area, continued to receive threats from far-right extremists mentioning a Democratic Party child sex trafficking ring (Hsu, 2017).

The seemingly ludicrous Pizzagate/Comet Ping Pong story illustrates the potential impact that disinformation and conspiracy theories propagated online through websites and social media can have on domestic terrorist threats – defined as politically motivated acts of deliberate and premeditated violence perpetrated within one country by nonstate actors against co-national targets aimed at influencing a wider audience. Deliberate dissemination of inflammatory disinformation through social media is ubiquitous today and a wide range of political actors across countries, including agents working on behalf of governments and political parties, indulge in the creation and promotion of disinformation (Bradshaw & Howard, 2017). During the 2016 Presidential election the average American was exposed to between one and three incendiary “fake news” stories per month on websites and through social media (Lazer et al., 2018). A study by Gunitsky (2015) found that at least 48 countries have at least one government entity or major political party engaged in manipulating public opinion by spreading disinformation through social media networks. According to the source of data used in this study, explained in more detail below, around 80 countries featured the deliberate dissemination of disinformation extensively or relatively extensively by domestic government, foreign government or political party actors during the period 2000–2017 (Mechkova, Pemstein, Seim, & Wilson, 2019).

Experts allege that online disinformation drives a range of adverse and potentially dangerous outcomes. For example, experts argue that consumption of disinformation online fosters citizen distrust of mainstream, non-partisan media and other sources of authoritative information (Allcott & Gentzkow, 2017; MacFarquhar, 2016; Warwick & Lewis, 2017). Online disinformation is linked to increased hostility towards liberal, centrist or establishment political figures, erosion of faith in the trustworthiness of social and political institutions and heightened toleration of or support for fringe, anti-establishment or radical political actors and movements (Beauchamp, 2019). Experts also argue that online disinformation helps to weaken support for democratic governance and increases tolerance of authoritarianism (Deibert, 2019; Gunitsky, 2015; Johnson, 2018). Individuals who frequent websites and social media communities featuring disinformation have been found to exhibit higher levels of political extremism and radicalization (Deibert, 2019; Johnson, 2018; Silverman, 2015). Consumption of such information is also alleged to be self-reinforcing in that it conditions individuals to be more receptive to future disinformation (Berinsky, 2017) and impairs their ability to distinguish bad from good information.
(Stevenson, 2018). Tufekci (2018) associates exposure to disinformation and conspiracy theories online to enhanced ethnic, racial, partisan and social group grievances and to the demonization of outgroups. Finally, disinformation disseminated online or through social media is argued to have played a significant role in fomenting episodes of political violence. For example, Gunitsky (2015) documents the importance of information and discussion within Facebook communities for fomenting and coordinating violence against Rohingya Muslims in Myanmar.

In this study, I examine whether online or social media disinformation contributes to a specific adverse, and dangerous, phenomenon: domestic terrorism. Quite a bit of academic research alleges that terrorist groups and terrorist activity is enhanced and reinforced by the internet and social media (for a good review of this literature, see Conway, 2017. For a counterpoint, see Benson, 2014). This literature argues that the internet and social media communities aid in radicalizing individuals and enhance terrorist group ability to recruit members, plan and execute attacks and publicize their activities and exploits. A recent study indicates that internet and social media users in the Arab World are more likely to respond to the appeals of terrorist actors such as ISIS (Piazza & Guler, 2019). However, there is scant empirical work on the impact of online disinformation on actual political violence4, and to my knowledge no one has empirically examined the impact of disinformation disseminated online or through social media on terrorism specifically.

In this paper, I theorize that when political actors deliberately dissemble false or misleading information through social media in order to manipulate political attitudes or to mobilize supporters, their endeavours produce an environment in which domestic terrorism is more likely to occur.5 I argue that an important – though not exclusive – mechanism through which disinformation online stokes terrorism is heightened political polarization or political tribalism. The deliberate dissemination of disinformation online by political actors increases political polarization in society – defined here as a condition where people living in the same society hold extremely differentiated and incompatible political opinions and adhere to mutually exclusive political or partisan identities6 – and that this makes terrorism a more frequent occurrence. I test this proposition using a sample of 150 countries for the period 2000 to 2017 and make two key findings. First, countries featuring the propagation of disinformation online through social media by governments, political parties and foreign governments do experience higher subsequent levels of domestic terrorism. Second, the impact of disinformation online on domestic terrorism is mediated through increased political polarization.

In the next section, I discuss the theoretical story linking online disinformation with polarization and domestic terrorism.

Social media disinformation, polarization, mobilization and domestic terrorism

How might misleading or false information deliberately propagated online through social media communities by political actors lead to increased domestic terrorism within countries?

There are several relatively straightforward pathways that are consistent with the existing literature on the impact of the internet on terrorism. Online disinformation aids two of the three terrorist group processes that Byman (2018) argues are facilitated by the
internet: propaganda and recruitment. When political actors disseminate disinformation through social media, they are attempting to communicate their political message to a wider audience through attention-grabbing, though misleading, claims and purported conspiracies. Furthermore, online disinformation aids terrorist recruitment by radicalizing individuals. Disinformation helps to ferment, reinforce and enhance personal and group grievances. It is designed to be incendiary, regardless of how ridiculous the claims, and plays to existing prejudices held by its consumers, thereby deepening their sense of outrage and grievance and whetting their appetite for militant action. Moreover, extremist groups use online disinformation to help forge community and comradeship among supporters. Individuals who consume and discuss disinformation or conspiracy theories online gain the sense that they are not alone but rather are among like-minded confederates. This aids the radicalization process, community building and the potential for collective action. It also helps to separate believers from the mainstream, reinforcing their group identification while vilifying members of opponent communities. In this sense, online communities propagating disinformation help to build what I term a “community of radicalization.” The consequence is that violent extremists can use online disinformation to reach, radicalize and recruit individuals into terrorist activity.

These assumptions are consistent with the literature on how the internet, in general, aids terrorist actors (see, for example, Davis & Cragin, 2009; Sageman, 2011; Stemmann, 2006; Von Behr, Edwards, & Gribbon, 2013). In particular, they comport with findings in a study of the use of the internet by right-wing extremists in Germany by Koehler (2014). The internet facilitates lack of inhibition in discussion, leading to the propagation of more and more incendiary information that furthers radicalization. Social media platforms frequented by right-wing extremists also help to validate their group identity, giving participants the notion that they represent a mass movement capable of action. These features aid extremist groups in their efforts to nudge individuals into participating in offline terrorist activity.

Given this theoretical framework, I expect countries that feature higher levels of disinformation propagated by political actors on social media platforms or through websites to experience, in turn, more domestic terrorist activity. The first hypothesis I test is:

H1. Countries experiencing high levels of disinformation disseminated online through social media by their governments, domestic political parties or by foreign governments will experience higher levels of domestic terrorism.

**Online disinformation, polarization and terrorism**

I further argue that one particularly important way that online disinformation stokes domestic terrorism is by enhancing political polarization within society. As illustrated by the discussion above, polarization is by no means the only way that disinformation online increases terrorism. Indeed, the results of my mediation tests, discussed in detail below, illustrate that though polarization significantly mediates the impact of online disinformation on terrorism, other (untested) processes are also an important part of the story. However, there is reason to suspect, at the outset, that political polarization is a particularly noteworthy link between disinformation and conspiracies disseminated online by political actors and terrorist activity. So much disinformation propagated online by political actors is aimed at constructing a tribal,
zero-sum vision of contemporary society where moderation and compromise are impossible and the other side is demonized, dehumanized and presents an existential threat. In this framework, online conspiracy theories and disinformation foster strong political tribalization and this produces a condition under which terrorism is more likely. In this section, I explain the theoretical logic, and supporting literature, for focusing on polarization as a crucial, though not exclusive, link between online disinformation and terrorism.

**Online disinformation and political polarization**

Online disinformation sharpens political polarization within society. Research has shown that political polarization and extreme or negative partisanship has grown dramatically in the United States (Iyengar, Lelkes, Levendusky, Malhotra, & Westwood, 2019) as well as in other countries (see Reiljan, 2020) in recent years. Studies by Azzimonti and Fernandes (2018), Ribeiro, Calais, Almeida, and Meira (2017), Suhay, Bello-Pardo, & Maurer, 2018 and Tucker et al. (2018) demonstrate that false or misleading information presented in social media communities or on online political opinion and news websites increases mass political polarization (for a contrary view, see Boxell, Gentzkow, & Shapiro, 2017). How this works is illustrated in a larger body of literature explaining how the internet and social media, as a medium, enhances political tribalism. According to this literature, social media works to divide people into incompatible, competing political tribes by fragmenting and stratifying their access to political information. Social media creates what experts call “filter bubbles” or “echo chambers” that substantially narrow and limit the range of political information that consumers are exposed to. This serves to insulate consumers from alternative information that might challenge their political beliefs and prejudices, thereby reinforcing their pre-existing political attitudes, rendering them all the more incompatible with alternatives and eventually enhancing political polarization (Bessi et al., 2015; Del Vicario et al., 2016; Hindman, 2008; Kelly & François, 2018; Schmidt et al., 2017; Sunstein, 2009, 2017; Tufekci, 2018).

Beauchamp (2019) depicts how this process works from the perspective of the individual consuming political information on social media. Political information disseminated through social media or political opinion websites and sources allows people to “retreat into their own biases” according to Beauchamp, providing them with a supply of confirmatory information. This makes them more impervious to contrary information and political opinions. The participatory nature of sharing information on social media also allows consumers to bond exclusively like-minded individuals, fostering the feeling of belonging to a besieged community. This experience serves to insulate the consumer against other information provided by “rivals” outside of the community.

Other work explains that the rise of social media and online opinion sites has had a profound effect on the overall political news ecosystem that has implications for polarization.

Deluging social media and the internet with political disinformation and conspiracy theories has fragmented the overall political news environment. This has produced several results. The gate-keeping and quality control functions of traditional media have been severely eroded. The overall media environment has become fragmented along ideological lines. The consequence has been sharp polarization of public opinion on the political issues of the day and the creation of fragmented media audiences that cannot assess the information they consume and cannot understand or accept alternative
information and viewpoints (Hong & Kim, 2016; Kelly & François, 2018; Kim & Hong, 2015; Prior, 2007; Sunstein, 2009).

Political actors have recognized the opportunities provided by this environment, and have taken action to exploit it. Political agents have come to use online communities and political opinion news sites to engage with and recruit political supporters, shape their opinions and mobilize them into political action. Often these political actors use inflammatory and divisive rhetoric and narratives to cultivate mobilizable partisans among users of online social media and internet sites (Kelly & François, 2018). Moreover, political actors have recognized the utility of disseminating misleading or disinformation – propaganda – through social media channels. Stanley (2015) argues that by purposefully deluging the internet with disinformation, they aim to create a disorienting “cacophony” that overwhelms citizens, prompting them to retreat to the safety of political tribalism.9

**Political polarization and terrorism**

Mass political polarization, which we have seen is fuelled in part by online disinformation, produces a host of negative attitudes and behaviours, many of which have the potential to increase the probability that a country will experience higher rates of political violence and terrorism. In terms of attitudinal effects, researchers observe that increased polarization is often associated with raised levels of anger and belligerence (Huddy, Mason, & Aarøe, 2015; Mason, 2015). Polarization also facilitates demonization of political opponents and promotes strong animosities against members of opposing political parties, political movements or social groups (Bougher, 2017; Iyengar et al., 2019). Extreme partisans also express lower levels of generalized trust (Hooghe & Oser, 2017). In terms of behaviours, empirical research demonstrates that polarized partisans are more likely to avoid members of rival political groups (Lelkes & Westwood, 2017), express bias against them (Mason, 2015) and engage in prejudicial decision-making against perceived political opponents and members of political or social outgroups (Iyengar & Westwood, 2015; Munro, Lasane, & Leary, 2010). Polarization has been found to foster higher levels of political antagonism among affected partisans and to prompt more verbal aggression, and verbal attacks, against political enemies (McLaughlin, 2020). Partisans exposed to political polarization are more likely to use dehumanizing language and metaphors when talking about members of rival political and social groups (Cassese, 2021). Finally, political polarization has been found to reduce partisans’ willingness to deliberate with political opponents or engage in productive discussion about political differences (Strickler, 2017).

Given this evidence, one can reasonably conclude that the attitudes and behaviours that political polarization foster increase the likelihood of political violence. If polarization enhances personal grievances among affected partisans, as suggested by the previous literature, it may further the process of radicalization and that can be exploited by radical, violent actors seeking to recruit cadres and promote political violence. Likewise, polarization drives group grievances and prejudices that can motivate political violence or can be similarly manipulated by violent extremist actors. The fact that polarization reduces the willingness of partisans to deliberate with political rivals impairs or forestalls peaceful efforts to resolve differences, producing an environment where political violence is more likely.
Some empirical research by scholars who study mass political polarization confirms the expectation that polarization can drive political violence. For example, Gøtzsche-Astrup (2019) determined using experimental evidence that polarization is associated with the radicalization process along with an increase in individual intention to engage in political violence. Similarly, in a recent unpublished experiment, Kalmoë and Mason (2018) find that hyper-partisans are more likely to rationalize physical harm against political opponents, while a smaller proportion are supportive of outright violence against political opponents. Furthermore, a handful of scholars who study terrorism have observed, and have empirically documented, that political polarization enhances terrorist activity in countries. For example, Weinberg, Pedahzur, and Perliger (2008) document how episodes of intense political polarization within societies have prompted non-violent political parties and political movements to adopt terrorism as a tactic. Martin and Perliger (2012) find that eras of increased left-right political polarization in Western and Southern Europe and Latin America have coincided with increases in domestic terrorism. Sayari (2010) similarly links periods of left-right polarization in Turkey with waves of left-wing and right-wing terrorism and political violence. Finally, O’Brien and Haider-Markel (1998) empirically find that cycles of political polarization in the United States predicts the rise and fall of right-wing militia organizations in the states.

**Social media, mobilization and terrorism**

Finally, social media itself enhances the opportunity to engage in terrorism. Put simply, social media provides an easy and effective means to mobilize radicalized individuals into direct action. It accomplishes this in several ways. Social media helps to break down what Tufekci (2018) refers to as “pluralistic ignorance.” Polarized and radicalized participants in social media communities come to realize that they have confederates that hold the same attitudes they do. This enhances their radical beliefs and provides a way to communicate, coordinate and mobilize with like-minded comrades, as Wahlström and Törnberg (2019) discuss in their analysis of the use of social media by right-wing terrorist groups. Radical and violent extremist groups seeking to recruit and mobilize members also find social media communities, chat rooms and websites useful for collecting data on potential recruits, for testing recruitment messages and micro-targeting interested individuals (Tufekci, 2018). A number of studies illustrate how the internet and social media has been used in this way to radicalize individuals, popularize anti-establishment political movements and political figures, and to coordinate and mobilize political protests and contentious politics (see Enikolopov, Petrova, & Sonin, 2018; Ruijgrok, 2017; Tufekci, 2018).

Similarly, social media can be used to motivate and coordinate political violence. Indeed, it is the conclusion of the Counter Extremism Project (2018), a non-partisan, nongovernment organization dedicated to combating online extremism, that social media websites, “help usher people into real-world violence.”

Given my theoretical expectation that disinformation disseminated through social media and internet sites is likely to increase the prevalence of domestic terrorism, by fostering higher levels of political polarization and by facilitating mobilization of direct action by disinformation-fuelled polarized individuals, the second hypothesis I test is:

H2. Increased dissemination of disinformation online through social media boosts domestic terrorism by widening political polarization in countries.
Research design

To test these two hypotheses, I empirically examine the effects of dissemination of disinformation through online social media by domestic government, political party and foreign government agents on the amount of domestic terrorist attacks a country experiences. I also assess whether the impact of propagation of disinformation on social media affects domestic terrorism rates in countries by boosting political polarization within the country affected. I employ two sets of empirical analyses: cross-national time series (country-year) regression analyses examining the impact of social media disinformation on domestic terrorism and mediation analyses for whether the impact of disinformation on domestic terrorism is mediated through political polarization. Both sets of analyses are conducted on a sample of between 156 and 163 countries, depending on the specification and data availabiliy, for the period 2000 to 2017. This produces between 2,591 and 2,744 observations. A list of all countries examined in the study can be found in Appendix Table 1. To help account for country-specific features that might affect the analysis, I calculate country-clustered standard errors in the estimations.

Table 1. Disinformation online and domestic terrorism, main results.

<table>
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<tbody>
<tr>
<td>Gov. Disinformation&lt;sub&gt;_t-1&lt;/sub&gt;</td>
<td>0.770**</td>
<td>(0.291)</td>
<td>0.527**</td>
<td>(0.179)</td>
<td>0.702***</td>
<td>(0.156)</td>
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<tr>
<td>Parties Disinformation&lt;sub&gt;_t-1&lt;/sub&gt;</td>
<td></td>
<td>1.349***</td>
<td>(0.193)</td>
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<td></td>
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<tr>
<td>Foreign Gov. Disinformation&lt;sub&gt;_t-1&lt;/sub&gt;</td>
<td></td>
<td>1.123**</td>
<td>(0.358)</td>
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<td></td>
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<tr>
<td>Online Media Consumption&lt;sub&gt;_t-1&lt;/sub&gt;</td>
<td>0.269</td>
<td>(0.278)</td>
<td>0.098</td>
<td>(0.285)</td>
<td>0.123</td>
<td>(0.277)</td>
</tr>
<tr>
<td>Gov. Censor Internet&lt;sub&gt;_t-1&lt;/sub&gt;</td>
<td>0.237</td>
<td>(0.271)</td>
<td>0.243</td>
<td>(0.251)</td>
<td>0.392</td>
<td>(0.240)</td>
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<tr>
<td>Regime Type (Polity 2)&lt;sub&gt;_t-1&lt;/sub&gt;</td>
<td>0.084*</td>
<td>(0.005)</td>
<td>0.070*</td>
<td>(0.003)</td>
<td>0.079*</td>
<td>(0.034)</td>
</tr>
<tr>
<td>Polity 2 squared&lt;sub&gt;_t-1&lt;/sub&gt;</td>
<td>−0.027***</td>
<td>(0.007)</td>
<td>−0.023***</td>
<td>(0.007)</td>
<td>−0.022***</td>
<td>(0.006)</td>
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<tr>
<td>Regime Age&lt;sub&gt;_t-1&lt;/sub&gt;</td>
<td>−0.011*</td>
<td>(0.005)</td>
<td>−0.010*</td>
<td>(0.006)</td>
<td>−0.008</td>
<td>(0.006)</td>
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<tr>
<td>Population (ln)&lt;sub&gt;_t-1&lt;/sub&gt;</td>
<td>0.959***</td>
<td>(0.103)</td>
<td>0.900***</td>
<td>(0.101)</td>
<td>0.962***</td>
<td>(0.105)</td>
</tr>
<tr>
<td>GDP per cap (ln)&lt;sub&gt;_t-1&lt;/sub&gt;</td>
<td>0.518**</td>
<td>(0.163)</td>
<td>0.571***</td>
<td>(0.159)</td>
<td>0.385*</td>
<td>(0.153)</td>
</tr>
<tr>
<td>Intrastate War (UCDP)&lt;sub&gt;_t-1&lt;/sub&gt;</td>
<td>0.620***</td>
<td>(0.139)</td>
<td>0.565***</td>
<td>(0.143)</td>
<td>0.658***</td>
<td>(0.160)</td>
</tr>
<tr>
<td>Constant</td>
<td>2.216***</td>
<td>(0.564)</td>
<td>1.991***</td>
<td>(0.476)</td>
<td>−18.526***</td>
<td>(0.512)</td>
</tr>
<tr>
<td>Obs.</td>
<td>2,745</td>
<td>2,745</td>
<td>2,745</td>
<td>2,745</td>
<td>2,591</td>
<td>2,591</td>
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<tr>
<td>Wald χ&lt;sup&gt;2&lt;/sup&gt;</td>
<td>7.00***</td>
<td>48.77***</td>
<td>9.86**</td>
<td>273.47***</td>
<td>299.19***</td>
<td>213.37***</td>
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<tr>
<td>Pseudo R&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.0079</td>
<td>0.0267</td>
<td>0.0150</td>
<td>0.0940</td>
<td>0.0983</td>
<td>0.1006</td>
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<tr>
<td>Country (clusters)</td>
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<td>163</td>
<td>163</td>
<td>156</td>
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</table>

Negative Binomial Estimations.

* p ≤ .1.
** p ≤ .01.
*** p ≤ .000.
Standard errors in parentheses, clustered on the country.
**Dependent variable**

The dependent variable of the study is an annual count of the number of domestic terrorist attacks occurring in each country. The data source for this variable is the Global Terrorism Database (GTD). The GTD defines terrorism as, “the threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious or social goal through fear, coercion or intimidation (GTD, 2019).” For the dependent variable I focus exclusively on domestic terrorist attacks and exclude transnational terrorist attacks. This is because some transnational attacks include incidents perpetrated by foreign actors, some of which cannot be assumed to have been affected by the online information environment within the country studied. However, because some attacks in the GTD that may be labelled as “transnational” involve nationals attacking foreign targets within their home country – for example, American nationals of a country attacking a foreign embassy in Washington, DC – I reran all models using an aggregate count of all terrorist attacks occurring within each country year. These produce the same core findings as those in the main analysis. The distribution of terrorist attacks within the sample is highly skewed. The number of attacks per observation ranges between zero – around 57.3% of all country-year observations have zero attacks – and 2,809 – the number of attacks experienced by Iraq in 2014 at the height of the ISIS insurgency. Furthermore, the dependent variable is a count measure that lacks negative values, is over dispersed and contains observations that are likely not temporally or spatially independent of one another. Because of these qualities, I use a negative binomial estimation technique (see Hilbe, 2011) for the cross-national time-series analyses.

**Independent variables**

I use three independent variables to measure online dissemination of disinformation via social media. Each of these are ordinal scale measures of the frequency and scope or intensity of dissemination of disinformation about salient political issues facing the country on social media by three different actors and their agents: domestic government, domestic political party and foreign government actors or agents. The three variables are derived from data collected by the Digital Society Project (Mechkova et al., 2019), a collaborative endeavour that utilizes the protocol and framework established by the Varieties of Democracy (V-Dem) database. For each type of actor – government, political part and foreign government – Mechkova et al. (2019, p. 21) examine how often its agents, “...use social media to disseminate misleading viewpoints or disinformation to influence [the domestic] population [of the country].” For the three measures, the ordinal scale ranges from zero, indicating that agents “never, or almost never” disseminate disinformation via social media “on key political issues,” to 4, indicating that agents disseminate disinformation on “all key political issues,” “extremely often (Mechkova et al., 2019, p. 21).” In the sample, dissemination of disinformation through social media is relatively uncommon. For the majority of country-year observations – around 50% for party agents, 55% for domestic government agents and 78% for foreign government agents – actors were rated as having provided disinformation on a few key political issues rarely or almost never. In contrast, in around 20% (for domestic government), 19% (for party) and 21% (for foreign government) of country-year observations actors were observed to disseminate
disinformation on many or all key political issues often or extremely often. Statistically, the three variables are strong correlates of one another.\textsuperscript{17} Out of concern for multicollinearity, I therefore include them in separate models in the analysis.

Control variables

For the cross-national time-series analyses, I run both naïve models and specifications that include a set of control variables that might affect the relationship between dissemination of disinformation on domestic terrorism. The first two of these controls hold constant the social media environment within the country. I control for how widespread social media use or consumption is within society. My expectation is that dissemination of disinformation through social media is likely to be low in countries where online social media consumption is also low. Moreover, it is possible that a certain level of internet participation by society is necessary in order for social media disinformation to have a significant impact on adverse outcomes like increased terrorism. To control for social media usage within countries, I use a variable from Mechkova et al. (2019, p. 21) which measures on a four-point ordinal scale the degree to which people consume domestic online media.\textsuperscript{18} Use of social media is very common in the sample. Around 74\% of all country-year observations are rated by Mechkova et al. (2019) as exhibiting “relatively extensive” or “extensive” consumption of online media.

I also expect government censorship of the internet to have implications for the impact of social media disinformation on domestic terrorism. Of course, if residents of a country cannot access the internet or social media sites due to government censorship, I would not expect dissemination of disinformation on social media to stimulate domestic terrorist activity to a high degree. I therefore control for government filtering of online content. To do this, I utilize a variable from Mechkova et al. (2019) that measures how frequently the government “censor[s] political information (text, audio, images, or video) on the Internet by filtering (blocking access to certain websites.)” This is measured on a 5-point ordinal scale.\textsuperscript{19} Government censorship or filtering is actually fairly rare in the sample. In only around 11\% of country-year observations does the government filter internet political information “often” or “extremely often.” In 43.9\% of the observations the government “never” or “almost never” censors information.

In addition to these controls, I add to the models some covariates that have been previously found to predict terrorism within countries. These include variables measuring the political regime of the country, using the Polity 2 indicator and a squared measure of the Polity 2 score (Marshall, Gurr, & Jaggers, 2018). Gaibulloev, Piazza, and Sandler (2017) found that countries scoring very high and very low on the Polity 2 scale – the strong democracies and the strong autocracies – were significantly less likely to experience terrorism. Furthermore, they found that anocracies, regimes populating the middle ranges of Polity 2, were significantly more likely to experience terrorism. Also included as a control is a measure of the durability of the political regime, derived from Marshall et al. (2018). Piazza (2013) found that regimes that more recently experienced a regime transition were more likely to experience terrorism. I also hold constant in the models the population size and level of gross domestic product per capita of the country.\textsuperscript{20} Both of these indicators help to hold constant the ability of the state to engage in effective domestic security policy. In theory, more populous
countries should have higher counterterrorism costs, particularly in terms of monitoring the population for terrorist threats while wealthier countries might have more resources to put into counterterrorism. Finally, I include control variables for the amount of previous political violence that the country has experienced, with the understanding that many countries experience temporal periods or spells of violent civil conflict and terrorism. To do this I added a measure from the UCDP/PRIO database which indicates whether intrastate wars, major civil conflicts or insurgencies are occurring within the country.

All independent variables in the estimations are lagged one year as their impact on domestic terrorism might take time to manifest. Descriptive statistics for all variables used in the analyses are summarized in Appendix Table 2.

Mediator

As previously noted, I hypothesize that the effects of dissemination of disinformation through social media by government, party and foreign government actors on domestic terrorism is mediated through increased political polarization. For the mediating variable, I turn again to Mechkova et al. (2019) and use a variable measuring how politically polarized the country is. This variable is an ordinal measure coded on a 5-point scale and which rates the degree to which the country is politically polarized and where there are sharp differences of opinion, and clashes of points of view, on key political issues. Polarization, including acute polarization, is relatively common in the sample. Around 24% of the country-year observations are characterized by severe or serious polarization and another 31% are characterized by moderately high levels of polarization. Around 23% of the sample exhibits medium polarization. Around 22% of observations are characterized by limited or no polarization.

Results

The results of the analyses broadly support the hypotheses. Disinformation propagated through online social media outlets is statistically associated with increases in domestic terrorism in affected countries. The impact of disinformation on terrorism is mediated, significantly and substantially, through increased political polarization. These results are robust to the inclusion of the control variables. They are also robust to different specifications. Furthermore, endogeneity tests indicate a causal relationship between dissemination of disinformation through social media and domestic terrorism, as illustrated in Appendix Table 6. Below, I discuss these findings in more detail.

Cross-national time-series tests

In Table 1 the results of the cross-national time series regression estimations are summarized. Models 1 through 3 summarize the naïve models. In these estimations, only the main independent variables – government, party and foreign government disinformation – along with a lagged measure of the dependent variable are included in the model. Disinformation disseminated by all three types of actors is a significant positive predictor of domestic terrorism in the naïve models. When the full set of controls are added to the
estimations – summarized by models 4, 5 and 6 – all forms of disinformation continue to be significant, positive predictors of domestic terrorism. These results provide partial support for hypothesis 1.

Within models 4 through 6, several of the controls are also significant. More populous countries are more likely to experience domestic terrorism as are wealthier countries and countries experiencing more intense intrastate armed conflicts. Countries with older political regimes are less likely to experience domestic terrorism in models 4 and 5 while regime type is also found to be a significant predictor. Strong democracies and autocracies are found to experience less domestic terrorism while middling regimes, as expected.

**Substantive effects**

I measure the substantive impact of disinformation disseminated through social media on domestic terrorism using marginal effects simulations. These simulations include the full set of controls used in models 4–6. These simulations are presented in Figure 1.

A one-unit increase – meaning an ordinal level increase – of government disseminated disinformation through social media is estimated to produce 2.26 more domestic terrorist attacks for the average country. In contrast, one unit increases in party propagated disinformation via social media is estimated to produce 2.85 more domestic terrorist attacks while a increase in foreign government false media produces 3.15 more attacks. These numbers may seem modest. However, it is important to recall how rare domestic terrorist incidents are for the majority of countries in the sample. Around 57% of countries experienced zero attacks in any given year while 73% experienced 2 or fewer attacks.

Figure 2 provides a different way of looking at the substantive effects of the estimations.

![Figure 1](image-url)  
*Figure 1. Substantive effects of one-unit increase of disinformation online on domestic terrorism. Produced using marginal effects simulation for models 4, 5 and 6. Includes all covariates.*
In this figure, the total number of domestic terrorist attacks a country is expected to experience is graphed by frequency of dissemination of disinformation via online social media while considering the contributions of all of the other control variables. Figure 2 reveals two patterns. First, as disinformation increases in the sample, countries experience more terrorism overall, with all other variables held constant. Second, provision of disinformation by foreign governments has an outsized effect on domestic terrorism.

Countries where disinformation is never disseminated are expected to experience between 1.3 and 2.1 domestic attacks, on average, depending on the actor providing the disinformation. Those numbers increase to between 2.7 and 4.0 attacks when disinformation is almost never disseminated. When social media disinformation is propagated half of the time, the frequency of attacks increase to between 5.4 and 9.1. It is at this level that a sharp divergence between the actors providing false online information is visible. In situations where actors disseminate disinformation through social media “often,” domestic terrorism increases to 10.2 and 11.0 attacks when the disseminating actor is the national government or political parties. It increases to 20.5 attacks when foreign governments often provide social media disinformation. Finally, in countries where national governments and political parties provide social media disinformation “extremely often,” domestic terrorism incidents rise, on average, to 17.2 and 22.1 attacks, respectively. However, in situations where foreign governments disseminate disinformation through social media “extremely often,” domestic terrorist attacks rise to 46.5 per year, on average.

**Figure 2.** Whole model substantive effects of dissemination of disinformation online and domestic terrorism. Produced using marginal effects simulation for models 4, 5 and 6. Marginal effect is for entire model. Includes all covariates.
**Alternative specifications**

To test the robustness of the findings, I conducted a couple of alternative specifications. First, I reran the models using country-fixed effects. These mostly reproduce the main findings. Disinformation disseminated by parties and by foreign governments significantly increases domestic terrorist attacks. The coefficient for national government provision of disinformation is positive in the fixed-effects models, but it falls short of statistical significance. These results are summarized in Appendix Table 4.

Second, though a wide range of online outlets have been used to disseminate misleading information, the launch of Facebook and YouTube in 2004 and 2005 dramatically increased opportunities for political actors to propagate disinformation. Furthermore, the Arab Spring events of 2011 further ushered in an era of use of social media for political communication and mobilization throughout the developing world. To examine the effects of these specific innovations and events, I reran multiple iterations of the models including dichotomous measures coded 1 for all observations from 2004, 2005, 2010 and 2011 on. These models also reproduce the main findings of the paper.24

Third, in theory propagation of disinformation through social media might be more prevalent in higher-income countries where a larger percentage of the population could be assumed to use the internet and social media sites more frequently.25 Because of this, it is possible the results in Table 1 are driven by the developed countries in the sample. The estimations in models 4–6 are specified to control for this factor, as they include measures for online media consumption and for the gross domestic product per capita. However, as a check I separated out developing world countries, based upon world region, from the sample and reran the estimations. These models reproduce the main findings.26 Looking only at developing countries, disinformation disseminated through social media positively predicts domestic terrorism.

Finally, it is possible that false online information spurs a certain type of domestic terrorism; namely terrorism motivated by issues and grievances prevalent in online social media communities. If this is the case, the dependent variable used in the main estimations – a count of all domestic terrorist attacks – may provide a conservative test of my hypotheses as it includes terrorism motivated by other factors. Nonetheless, to further test for this possibility, I rebuild the dependent variable to be a count of domestic terrorist attacks in countries where individuals are found to more frequently mobilize terrorist activity on social media. My reasoning here is that domestic terrorism in contexts where terrorism is mobilized through social media is likely to be motivated by information on and communication through social media. To create this variable, I used an indicator from Mechkova et al. (2019) that measures the presence of offline terrorist activity that is commonly mobilized through social media27 and simply counted domestic terrorist attacks in observations where the indicator is greater than 0. This altered dependent variable produces the same finding in the main analysis. Indeed, the results are substantively stronger, lending credence to the claim that the dependent variable in my main analysis provides a conservative test. The results of this robustness check are summarized in Appendix Table 5.
Mediation tests

To test the second hypothesis – that dissemination of disinformation on social media increases domestic terrorism by fostering higher levels of political polarization – I conducted sets of mediation tests using a technique developed by Imai, Keele, and Tingley (2010) and Imai, Keele, and Yamamoto (2010). In this analysis, I furthermore bootstrapped the results for 50 iterations and conducted sensitivity analyses to address the degree to which the analysis is affected by problems associated with the sequential ignorability assumption. The results of these are presented in Figure 3(a,b and c). These tests indicate that the effects of government, party and foreign government disinformation on domestic terrorism are mediated through increased political polarization. Propagation of disinformation on social media, across all three independent variables, increases the level of political polarization within society which, in turn, boosts domestic terrorist attacks. Moreover, inclusion of polarization in the model reduces the size of the coefficients for government, party and foreign government provision of disinformation, suggesting partial mediation. Finally, the proportion of the effect of provision of disinformation through social media on domestic terrorism, reported below each figure, indicates that the polarization mediates around 24.3% of the effect of government disinformation on domestic terrorism, around 13% of the effect of party disinformation on domestic terrorism and around 7.1% of the effect of foreign government disinformation on domestic terrorism. What this suggests is that political polarization is an important intermediary between disinformation and terrorism, but it is not the only variable mediating the relationship.

Conclusion

In conclusion, I find that countries where political actors more frequently and widely disseminate disinformation on social media experience more domestic terrorism. I also

![Figure 3. Mediation tests.](image-url)
find that an important way that online disinformation stokes domestic terrorism is by deepening political polarization and tribalism within countries. Overall, the results of the study show that online disinformation has real consequences for physical security, and should be considered seriously within counterterrorism discussions. Recent mob violence against the U.S Capitol building on January 6 2021 underscores the urgency of addressing disinformation disseminated through social media by top political officials, including the President of the United States, as an accelerant of terrorism and political violence in the context of extreme political polarization. To date, over 30 countries have initiated action against online disinformation, ranging from opening official task force investigations to proposing and passing laws regulating online fake news (for an overview, see Funke & Flamini, 2019). Moreover, tech companies such as Facebook, Google, Microsoft and Twitter recently signed on to a European Union code of practice on online disinformation, pledging to regulate the dissemination of fake news through their platforms and products. The European Commission is furthermore considering a Digital Services Act that will provide an enforcement mechanism for tech companies, holding them liable for online disinformation (Schulze, 2019). If effective, the results of this study suggest that all of these developments could reap security dividends in the form of reduced domestic terrorism.

Future research is needed, however, to gain more than a rudimentary understanding of how online disinformation and subsequent political polarization drive terrorism, and what can be done in response. This study is a first-cut analysis of the relationship between disinformation on social media, political polarization and domestic terrorism at the aggregate, country-level. As such, it does not directly examine whether individuals exposed to social media disinformation in the context of a polarized political environment are more likely to approve of, support or engage in political violence. Moving forward, researchers could leverage experimental designs to test whether social media disinformation prompts subjects to express higher levels of support for terrorism or actors that use terrorism.

The study raises other questions for future investigation. The finding that foreign government dissemination of misleading or disinformation online stimulates domestic terrorism to a higher degree than disinformation from other political actors, like domestic governments or domestic political parties, is intriguing and warrants further examination. Future research can explore whether foreign government-produced disinformation is intrinsically more polarizing, is more often directly geared towards fomenting violence or if it is associated with foreign government material support for violent extremists within countries.

The results raise other questions that require additional research. Do certain types of online disinformation have a higher propensity to drive polarization and induce violence? Is the impact of disinformation-fuelled political polarization similar for all types of political actors and perpetrators of domestic terrorism? Does the effect of disinformation on social media have an ideological symmetrical effect on political polarization, or are individuals of certain political persuasions more likely to be radicalized and mobilized by online disinformation and eventually support, or engage in, domestic terrorism? Finally, once regulations and countermeasures such as those voluntary adopted by tech companies or imposed by states or the European Union are implemented, will we witness a decline in domestic terrorism, as the study suggests?
Notes

1. Disinformation refers to deliberately propagated false or misleading information (Tucker et al., 2018).

2. While the theoretical argument and research design of the study focuses on disinformation disseminated through social media platforms, in reality a variety of online media are used to produce disinformation including blogs, websites and even online news websites. Because I look at a variety of actors that promote disinformation that have different endowments of technological or financial resources – national governments, foreign governments and domestic political parties – it makes most sense to focus on the form of online media with the lowest barriers to entry: social media.

3. Approximately 44.4% of all countries in the total sample. Note, the number of countries in the main analyses is lower due to missing data.

4. There have been a couple of empirical studies on the impact of social media and hate crimes. For example, a study by Young, Swamy, and Danks (2018) determined that there is a positive relationship between misinformation and expressions of hate speech in YouTube comments and the subsequent perpetration of physical violence. Other studies draw a link between social media usage, but not misinformation, and hate crime. For example, unpublished studies by Müller and Schwarz (2020, 2018b) found that hate crimes against immigrant victims in Germany or against Muslims living in the United States were higher in localities where social media usage and Twitter is higher.

5. As will be explained in the research design section below, the study examines the impact of the climate of social media disinformation on country-year counts of domestic terrorist attacks within the country. The study does not delve into specific terrorist or extremist actors and how they may be affected by social media disinformation.

6. This definition conforms to the operationalization scheme used for the main independent variable of the study developed by Mechkova et al. (2019, p. 21). Conceptually, my use of the term political polarization mirrors closely to what Iyengar, Sood, and Lelkes (2012) refer to as “affective polarization” or to what Mason (2015) calls “social polarization.” Affective or social polarization can be distinguished from the traditional term polarization in that it is a mass rather than a simply elite phenomenon and it transcends single policy issues but rather is associated with political or partisan identity. See Fiorina and Abrams (2008) for a full discussion of the different uses of political polarization.

7. The third process facilitated by the internet, according to Byman (2018), is operational direction. In the case of the Comet Ping Pong attack, one could argue that online disinformation aided the attacker in the selection of the target, which would be an example of online misinformation contributing to terrorist operational direction.

8. The participatory nature of social media is crucial here. Social media and websites provide a participatory outlet for individuals through message boards, chat rooms and comments boards. This furthers the process of radicalization and the construction of group identity.

9. For more information about this process, see Jason Stanley interview by Illing (2019). He explains, “[Politicians like Trump] flood the media zone with all kinds of bizarre nonsense … [a]nd what this does is create a complete cacophony. It’s just too much for anyone to sort out. And the result is people just say, ‘Well, who’s on my side?’ … It’s not about ideas or facts but about my side and your side…”

10. The GTD is an event database compiled and curated by researchers at the START Center at the University of Maryland. The codebook for GTD can be found online at: https://www.start.umd.edu/gtd/.

11. Though the GTD defines terrorism as violence used by non-state actors, its coding rules do not preclude attacks by political actors that have political wings that hold governmental responsibilities (e.g., Hezbollah in Lebanon). The attacks of such actors are counted by the GTD and are included in the analysis. My expectation is that terrorism by these sorts of actors is similarly affected by social media disinformation.
12. Domestic terrorist attacks are attacks that occur within the borders of a single country and where the perpetrator and target or victims are citizens or permanent residents of the country. Transnational terrorist attacks are those where the perpetrator and the victim or targets are citizens or residents of different countries and/or where the attack transcends a national border.

13. Results available from author. Note that it is likely that these checks reproduce the main results because a majority of attacks, 80%, in the GTD are domestic.


15. Like V-Dem, the Digital Society Project uses multiple country specialists to derive measurements for its various indicators. The measures are derived through various aggregation methods, including distilling measures into ordinal scales based upon combined specialist judgements.

16. Variable names are “v2smgovdom” for domestic government dissemination of disinformation, “v2smpardom” for party dissemination of disinformation and “v2smfordom” for foreign governments dissemination disinformation in Mechkova et al. (2019, p. 21). Note, in the original ordinal scale developed by Mechkova et al. (2019), the scores range from 0 to 4 where a score of zero is the highest frequency of dissemination of disinformation and a 4 is the lowest frequency. To ease interpretation of results in the study, I have inverted this scale. Specifically, in the inverted scale I use in the analysis: 4 = Extremely often. Actors disseminate disinformation on all key political issues; 3 = Often. Actors disseminate disinformation on many key political issues. 2 = About half the time. Actors disseminate disinformation on some key political issues, but not others. 1 = Rarely. Actors disseminate disinformation on only a few key political issues. 0 = Never or almost never. Actors never disseminate disinformation on key political issues.


18. “v2smoney,” “Do people consume domestic online media?” Responses: 0 = Not at all. No one consumes domestic online media; 1 = Limited. Domestic online media consumption is limited. 2 = Relatively extensive. Domestic online media consumption is common. 3 = Extensive. Almost everyone consumes domestic online media. (Mechkova et al., 2019).

19. “v2smgovfilprc,” “How frequently does the government censor political information (text, audio, images or video) on the Internet by filtering (blocking access to certain websites)?” Note, to ease interpretation, I invert the scale to the following: Responses: 4 = Extremely often; 3 = Often; 2 = Sometimes; 1 = Rarely; 0 = Never or almost never. (Mechkova et al., 2019).


21. Data and codebook are available online at: https://www.prio.org/Data/Armed-Conflict/UCDP-PRIOR/.

22. These controls represent the most commonly included covariates in empirical studies of terrorist attacks. However, they do not represent an exhaustive set of potential controls. In order to address possible spuriousness produced by omitted variable bias, I take two steps. First, using Morris and LaFree (2016), I identify an extended set of controls to include in estimations. These are: country Gini coefficient to measure income inequality; ethno-linguistic fractionalization; GDP growth; the protection of physical integrity rights within the country; whether or not the country is involved in an interstate war; and the urbanization rate of the country. These robustness models produce the same findings as those in the main models. I do not use them as the main models because their inclusion severely reduces the number of observations and drops several country cases due to missing-ness and list-wise deletion. Including the extended controls reduces observations by 25% and drops the number of countries in the analysis from 156 to 117. I therefore use them as robustness checks only. Appendix Table 3 presents the models with the extended controls along with a short description of the extended controls. Second, to account for any country-level features that are not captured by the controls in the main models, I also conduct country fixed effects estimations. These are presented in Appendix Table 4.
23. “v2smpolsoc,” “How would you characterize the differences of opinion on major political issues in this society?” Note, to ease interpretation, I invert the scale to the following: Responses: 4 = Serious Polarization. There are serious differences in opinions in society on almost all key political issues, which result in major clashes of views; 3 = Moderate [high] polarization. There are differences in opinions on many key political issues which result in a moderate clash of views. 2 = Medium polarization. Differences in opinions are noticeable on about half of the key political issues resulting in some clashes of views. 1 = Limited polarization. There are differences in opinions on only a few key political issues, resulting in few clashes of views. 0 = No polarization. There are differences of opinions but there is a general agreement on the direction for key political issues.

24. Results available from the author.

25. There is some evidence this is the case, though differences in social media usage between developed and developing countries are fairly modest. The average score for online media consumption is 2.1 for “developed countries” (countries in North America, Western Europe, Central and Eastern Europe and Eurasia) while it is 1.8 for “developing countries” (countries in Latin America, Africa, the Middle East, East, South and Southeast Asia).

26. Results available from author. Note that in these analyses I also include a measure of income inequality to hold constant disparate economic levels within developing countries.

27. “v2smorgtypes,” “What types of offline political action are most commonly mobilized on social media?” Answer: “v2smorgtypes_7” “Terrorism.” Average of expert score where 0=no and 1=yes.

28. Specifically, I used a statistical package for Stata designed by Hicks and Tingley (2011) called “medeff” which is adapted from Imai, Keele, and Tingley (2010) and Imai, Keele, and Yamamoto (2010).

29. To conduct sensitivity analyses, I used the “medsens” Stata statistical package, also developed by Hicks and Tingley (2011). Full results of these tests are available from the author.

30. This can be seen in Figure 3(a, b and c) when comparing the β coefficients for estimations where the mediator is included – the top coefficient not in parentheses – and included – the bottom coefficient in parentheses.

31. In response to the January 6 violence against the U.S. Capitol, Twitter permanently banned former U.S. President Donald Trump’s account due to his frequent dissemination of disinformation.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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