

Post-Truth Spaces: Studying Authenticity and Influence on the Internet

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This study contributes to a larger research project aiding fact-checkers and verification specialists in their work. It develops a technique to locate and measure the influence of problematic source clusters on social media that serve as leads. We dub these source clusters “post-truth spaces.” We first situate the post-truth space next to other spaces online where problematic information holds sway, including the “alternative influence network,” “fake news” engagement spaces, “coordinated inauthentic behavior” campaigns, and “participatory propaganda” circulation. In the post-truth space mapping technique in focus here, we locate and discuss actors, websites, and social media pages grouped together based on their inter-referencing. Their provenance is studied through digital investigation techniques and their influence through a metric measuring their distance to mainstream (or other) spaces online. We conclude with a case study of one such space on Moldovan Facebook, demonstrating the mapping technique, provenance work, and influence measure, all of which may be applied practically.

Keywords: alternative influence network, fake news, coordinated inauthentic behavior, participatory propaganda, digital investigation

Introduction: Situating Post-Truth Spaces

This research was conducted as part of a multi-institutional project aimed at aiding fact-checkers and verification specialists in their work. This larger project, vera.ai, financed by the European Commission, aims to develop methods to that end. These fall into two categories: those that produce leads—such as problematic sources or trending narratives that could be fact-checked—and those that detect fakes, including AI-generated or manipulated content. Of interest to fact-checkers in each instance is the extent to which sources and content attain considerable reach. Significant sources may also share such content

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and claim they are real. Our work falls into the first category (producing leads) and strives to measure their significance by proposing an influence metric.

In what follows, we develop and situate the concept of the post-truth space and present mapping and verification methods to locate and study it. Our contribution is conceptual, methodological, and practical.

Conceptually, the post-truth space may be situated among various spaces where “problematic information” holds sway, and information circulation, campaigning, and operations are undertaken (Jack, 2017). Among these are the “alternative influence network” (Lewis, 2018), “fake news” engagement spaces (Bounegru, Gray, Venturini, & Mauri, 2018; Silverman, 2016), “coordinated inauthentic behavior” campaigns (Giglietto, Righetti, Rossi, & Marino, 2020, p. 867), and “participatory propaganda” circulation (Starbird, DiResta, & DeButts, 2023; Tuters & Noordenbos, 2024; Wanless & Berk, 2020).

Alternative influence networks consist of extreme, often far-right political influencers who host each other on their YouTube channels (de Keulenaar, Tuters, Osborne-Carey, Jurg, & Kisjes, 2022; Lewis, 2020). Fake news engagement spaces are those where political or election-related posts rated as hyper-partisan receive more interactions than posts considered more mainstream (Rogers, 2021). In its commodified version, it may also refer to sets of hyper-partisan posts spread by upstart web outfits, manufactured to attract attention and earn revenue regardless of political alignment (Braun & Eklund, 2019; Herrman, 2016). Coordinated inauthentic behavior campaigns are driven by actors (and perhaps bots) who disseminate the same or related content in synchrony (de-Lima-Santos & Ceron, 2024). The aim is to make the content go viral or to reach a threshold of interactions and views that signals influence. Finally, participatory and ambient propaganda are more bottom-up than orchestrated, relying on various online actors, including everyday users, to spread the word. “Ampligandists” is one term used to capture this actor type (DiResta, 2021). Participatory propaganda implies a blurring of boundaries between propagandists and their audiences (Wanless & Berk, 2017). While such participation may appear organic, it could just as well be performed by actors hired for that purpose, such as front groups, digital advertising and analytics-driven campaigns, or other “disinformation-for-hire” practitioners (Grohmann & Corpus Ong, 2024).

In our work, post-truth spaces reflect the growing interest in studying “alternative facts,” the actors and sources that propagate them, and the sway they hold as part of a counterprogram for “asserting political dominance” and influence (McIntyre, 2018). As scholars have pointed out, the study of the post-truth phenomenon concerns not only the disinformation, alternative assertions, and spin of state media, politicians, and commentators but also how they are received (Wight, 2018); after all, its original definition emphasizes “circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief” (Oxford Dictionaries, 2016, n.p.). In this sense, fact-checkers and other verification specialists are also concerned with how to locate alternative facts that are particularly influential.

We situate our work methodologically. First, we describe how these five spaces of interest have been located and studied. Each of them is mapped or charted with different techniques—ranging from network and engagement analysis to content similarity measurements, which we enumerate. Alternative

influence networks rely on YouTube co-host networks; fake news comparing the engagement of problematic sources with mainstream ones (often on Facebook); coordinated inauthentic behavior on the rapid sharing of the same content (often on Facebook or X/Twitter); and participatory propaganda on coordination, be it by seemingly everyday users or the digital influence industry. Post-truth space mapping relies on sets of sources that share the same content.

The mapping method surfaces problematic source clusters, which are then used by fact-checkers who are interested in workflows that produce sources they can follow (Graves & Amazeen, 2019); they continually curate source lists they can check for leads or stories of interest to fact-check. Fact-checkers also want to know whether these stories resonate—whether they earn significant engagement on social media, particularly on Facebook. The post-truth space mapping method addresses this by also measuring influence, as discussed below.

In what follows, we situate our concept and method of post-truth space mapping. We then present a case study of Moldova to demonstrate the post-truth space mapping technique and the influence metric for its application by fact-checkers and verification specialists. The demonstration also prepares the ground for employing the method in other countries and regions (initially Eastern Europe) where such spaces are likely active. In the broader Russia-Ukraine war discourse on Moldovan Facebook, we found a mix of problematic sources linked to a larger source set of borderline content that wielded substantial influence in the overall discourse.

Alternative Influence Networks

The term alternative influence network was coined to capture the growing influence of alternative, often extreme, internet celebrities on YouTube (Lewis, 2018). These YouTubers, or internet celebrities and influencers with well-performing YouTube channels, regularly post content, pursuing a “monetary and political agenda” (Soriano & Gaw, 2022, p. 782). Individually, they have the characteristics of successful YouTube performers, with high channel subscriber counts and video content that is monetized (Hua, Ribeiro, Ristenpart, West, & Naaman, 2022).

In tune with the platform’s culture, they employ influencer techniques, cultivating a relatable persona through visibility and relational labor (Abidin, 2016; Baym, 2018) and building a following or fan base (Marwick, 2013). Many often sell merchandise and other products, but their significance lies in the political ideology they espouse, marked by vocabulary associated with white supremacy, misogyny, anti-political correctness, and other reactionary discourse (Marwick & Lewis, 2017). They are described as “reactionary” because of their “general opposition to feminism, social justice, or left-wing politics” (Lewis, 2018, p. 8). They are labeled an alternative influence “network,” owing to their collective efforts, which include co-hosting streamed “debates,” also known as “blood sports,” and collaborating on other online content.

Methodologically, the network is mapped through co-occurrence analysis. These co-occurrences are typically appearance-based. That is, one extreme internet celebrity appears with another on his or her YouTube show. The work is largely manual: compiling a list of alternative influencers and their YouTube

channels, then reviewing their videos to identify guest appearances. More specifically, one creates a table and converts it into a network file to visualize co-occurrence, showing how extreme Internet celebrities cluster together.

Another methodological technique to map alternative influence networks is to use YouTube's API by entering influencer channel IDs to retrieve the channels they subscribe to and feature (Rogers, 2024). Subscriber and feature networks can indicate the strength of ties between influencers. Do they subscribe and/or feature each other more often than other types of channels? Comparing manual results with API data may be useful, given that cross-subscription and featuring are additional indicators of linkage. Another relevant measure is channel mentions: when a YouTuber tags another channel in a video (using @channel), the channel owner is alerted, potentially creating network effects that can be mapped.

Subsequent analyses of the original alternative influence network technique (Lewis, 2018) have given additional attention to YouTube's recommendation system of "related videos" or those next up on the carousel (Dickinson & Cowin, 2022). In analyzing recommendation algorithms, a great deal of scholarly and journalistic attention has been paid to the so-called "rabbit hole," which departs from the platform's interest in extending viewer watch time (Nicas, 2018; Roose, 2019; Tufekci, 2018; Yesilada & Lewandowsky, 2022). This may be accomplished by delivering related videos that are more extreme or sensationalist (Alfano, Fard, Carter, Clutton, & Klein, 2021) or that serve misinformation when looking for information (Avaaz, 2020). More recent scholarship finds that extreme videos are not recommended to viewers of milder content, unless they actively search for them (Brown, Bisbee, Lai, Bonneau, Nagler, & Tucker, 2022). Only then do such videos appear as recommendations, whether in the user's carousel or elsewhere online. Recent scholarship argues that users are likely already part of the alternative right ecology through YouTube channel subscriptions or by receiving YouTube video links from other sources (e.g., on 4chan) (Chen, Nyhan, Reifler, Robertson, & Wilson, 2023).

The new findings that implicate the user rather than the algorithm for journeying down the rabbit hole are often attributed in part to YouTube's 2019 changes to its recommendation systems (Chen et al., 2023; Yesilada & Lewandowsky, 2022; YouTube, 2019a). These changes concern multiple efforts to demonetize and suppress harmful and "borderline" content, or material that comes close to violating platform rules (YouTube, 2019b).

Concerning material on social media, the term "borderline content" appears to have originated with YouTube, reported when the platform found a video featuring a Nazi-style saluting worthy of a takedown because it "bordered" on its hate speech policy (Meyer, 2018). Facebook adopted the term the same year, expanding it to cover "sensationalist and provocative content" as well as "click-bait and misinformation" (Constine, 2018, p. 2).

In the work described above, both crawlers and user simulations (or personas) have been used to capture recommendations and assess the extent to which YouTube pushes viewers down the rabbit hole. The YouTube API (at the time of writing) also offers related videos, though not the ones in the Up Next roll. Rather, their relationship lies in the fact that they have been "co-commented upon."

Fake News Engagement Spaces

Fake news became a buzzword in 2016, referring especially to a type of content that drew considerable engagement on Facebook during the U.S. election campaign. It refers to fabricated and “hyper-partisan” news sources that collectively outperformed mainstream outlets in the months before the election (Silverman, 2016). Such content received high engagement (likes/reactions, shares, and comments) and typically leaned toward the political right. Hyper-partisan or “ideological web operators” (Herrman, 2016, p. 50) are particularly relevant because they garnered a disproportionate share of interactions compared with the other content types, such as “pink slime” websites that mimic news sites, but are impostors (Bengani, 2020).

In the scholarly literature, fake news has been defined in various ways. One review identified five uses of the term, ranging from satire and parody to news fabrication, manipulation, and propaganda (Tandoc, Lim, & Ling, 2018). Whereas the first two aim to entertain, the latter aim to deceive. Other expositions expanded these categories under the broader term “information disorders,” advocating for the term to be eschewed in favor of alternatives (Wardle, 2023; Wardle & Derakhshan, 2017). In this regard, other proposals have sought to change the terminology. For example, Facebook (now Meta) prefers “false news” over fake news. This redefinition (which excludes hyper-partisan or borderline content) has the advantage of shrinking the scale of the problem (Rogers, 2020).

One recurring theme in fake news production is profit. The original Facebook “fake news” story mentioned a cottage industry in North Macedonia that created websites such as TrumpVision365.com, USConservativeToday.com, DonaldTrumpNews.co, and USADailyPolitics.com, populating them with “outrageous” political content to attract clicks and Google ad revenue (Silverman, 2016; Silverman & Alexander, 2016). As many reported, it worked. An in-depth examination found that an online marketing course by a North Macedonian local, called the “Facebook Marketing University,” “launched most of the young fake news disseminators into their careers” (Hughes & Waismel-Manor, 2021, p. 21). It markets itself as follows: “maybe you have heard that a team of individuals from Macedonia somehow helped U.S. President Donald Trump win the 2016 US elections. It was my crew and my students from Macedonia” (Ceselkoski, 2018, p. 1). The course trained “hundreds of students” to build websites and Facebook pages that produced “sensational content” with “clickbait headlines” (Hughes & Waismel-Manor, 2021). These Facebook operators were in it for the money, and many of them experimented with health or other non-political content before discovering the pecuniary potential of election-related material. Through A/B testing, trial and error, and niche experiments, as suggested by the marketing course, they learned that pro-Trump (or especially anti-opponent) content was far more profitable than content on other candidates or topics.

While some journalists and scholars emphasize this group’s lack of political purpose (Subramanian, 2017; Tynan, 2016), others discuss how it qualifies as disinformation, given the deliberate effort to produce and share such content. Some have even suggested that the creators were manipulated or part of a coordinated influence campaign (Cvetkovska, 2018; Silverman, Feder, Cvetkovska, & Belford, 2018). Yet, extensive fieldwork found no evidence, with the course instructor calling the political content a “domestic product of Macedonia” (Hughes & Waismel-Manor, 2021, p. 23).

Methodologically, both data journalists and fake news operators used the same software to analyze Facebook engagement: BuzzSumo, a marketing research tool (Ceselkoski, 2018; Silverman, 2016). To show that fake news outperformed mainstream news on Facebook, journalists ran election-related queries in BuzzSumo, retrieving lists of websites ranked by interaction score. They repeated this for three 3-month periods, tallying interaction counts for stories from mainstream news sites (based on a curated list) and from sites variously labeled “fake,” “false,” “untrustworthy,” or “hoax” (Silverman, 2016). The term “Fake news” persisted, but as Silverman later noted, it became an “empty slogan” after it was “manipulated” by politicians (initially Donald Trump) to delegitimize media organizations (Silverman, 2017).

The study of the significance of fake news on Facebook has shifted. In response to original fake news reporting and other studies highlighting the strong performance of hyper-partisan content, particularly from the right, discussion has centered on the difference between engagement and “reach,” a marketing term for content views (Roose, 2021). Because reach data were not public, Facebook argued that traffic to hyper-partisan websites was comparatively modest, downplaying the magnitude of the problem. In this way, Facebook redefined fake news, as mentioned above, and introduced a different metric for its quantification.

Campaign Spaces Organized through Coordinated Inauthentic Behavior

“Coordinated inauthentic behavior” (CIB) is a term coined by Facebook to describe “networks of accounts [that] mislead others about who they are, or what they’re doing” (Facebook, 2018, p. 1). Both the definition and the takedown actions the company has implemented against these activities should be seen in the context of not only its fake news problem but also the Russian influence campaign on its platforms during the 2016 U.S. election and beyond (DiResta et al., 2018; Nimmo & Agranovich, 2022). The question facing researchers working both inside and outside social media platforms, occasionally in collaboration, concerns distinguishing between legitimate and illegitimate online campaigning. Often, the distinction rests on artificial versus genuine users and automated or timed behaviors versus less orchestrated activity.

There are signals or indicators that are gauged to ascertain fake sources and accounts. For example, were the campaign pages and domains created or registered around the same time frame, and does the campaigning activity coincide with a 9am–5pm, Monday-Friday workday (Nimmo & Torrey, 2022)? Once these operations are discovered, Meta, for example, blocks the web domains from appearing on its platforms and removes the Facebook pages, groups, and accounts linking to them.

Distinctions between the authentic and inauthentic may be blurry, given that campaigns may be joined by “unwitting crowds” who participate in the activities and assume they are genuine (Wilson & Starbird, 2020). In studying coordinated inauthentic behavior, impact or influence can be measured in these terms: How many likes, reactions, or shares came from unwitting users’ accounts not associated with the campaign? Such measures show the spread or propagation beyond the operation itself.

Whether padded by the inauthentic accounts or by authentic users, the achieved metrics (perhaps combined with the campaign’s duration) are how influence is measured, at least in the first instance. In the 2016 Russian campaign on Facebook, propaganda posts were shared “hundreds of millions of times” (Timberg, 2017, p. 1) and were not detected until after the U.S. election. More recent campaigns propagating Iranian

narratives against the United States, Israel, and Saudi Arabia—or Russian narratives about the war in Ukraine—have been far less effective, despite their persistence (Lim et al., 2019; Nimmo & Torrey, 2022).

Influence is also measured by second-order effects, such as the uptake of desired narratives and talking points by reputable news sources, or the internet hitting the streets, with both demonstrations and counterdemonstrations organized by online operatives (Allbright, 2017; Ruijgrok, 2017). Another is the successful mobilization of subcultures or movements—for instance, corona-skeptics in one country adopting a broader “corona-politics” that extends beyond protesting lockdowns to expressing interest in exiting the EU (Callison & Slobodian, 2021).

Approaches to studying coordinated inauthentic behavior range from analyzing account and source features or signals to examining their networking activities, especially their interconnections and timely inter-referencing. Inauthenticity may also reside in the use of social bots or botnets for “engineered social tampering” (Ferrara, Varol, Davis, Menczer, & Flammini, 2016, p. 96). Bots may automatically retweet another account’s post, amplifying it; a botnet could perform the same on a larger scale. In all cases, the purpose is to make a post appear influential and push it beyond the operation’s bubble.

A signals approach, as applied to X/Twitter, for example, would examine features such as an (uncopied) profile photo, account creation date, and username length and composition, where a good photo, account maturity, and shorter usernames (without alphanumerical characters) indicate authenticity (Ferrara et al., 2016). A more comprehensive ‘signature’ approach would add tweeting and following characteristics, looking for patterns, such as high numbers of retweets or follows.

A network analysis may also examine follow-follower relationships, identifying accounts with star-shaped patterns or clusters of accounts that largely follow only one another. Coordination may be assessed through content-referencing, including the extent to which they retweet the same set of accounts’ tweets and/or the same URLs. One detection approach (for Twitter) looked for “retweeting,” “co-retweeting,” and “co-tweeting,” where the coordinating accounts shared the same content in three ways (Keller, Schoch, Stier, & Yang, 2019).

Typical influence campaigns, as noted above, are seeded with combinations of websites and social media accounts or pages. A network analysis would examine the extent to which a set of Facebook Pages references the same websites, as was found in the case of a Russian influence network reported by Meta (Nimmo & Torrey, 2022). The same approach may be taken for X/Twitter campaign detection. To study influence, particularly on Facebook, one would prefer to have the number of views that a post has received together with its engagement. These data points enable the application of a metric that gauges engagement by reach. CrowdTangle once provided the engagement metrics (without the reach); more recently, Meta’s Content Library also serves reach data.

Participatory Propaganda

Scholars contrast participatory propaganda with the mass media broadcast model associated with propaganda (Ellul, 1965; Wanless & Berk, 2020). It takes as the point of departure an active, networking

audience as its locus of attention rather than a target audience to be manipulated by a set of operators (Benkler, Farris, & Roberts, 2018). There is a second difference, too. While it may still be considered a program, its origins are obscured or diffused, lacking a clear master source.

There are at least two types of participatory campaigning for gaining influence. In one version, the campaign's participants are amplifiers or "ampligandists," not just consuming the narratives but also spreading them (Starbird, Arif, & Wilson, 2019). The spread may be improvisational or unwitting (Starbird et al., 2023).

A second type seeks to exploit existing "culture wars" or sensitive societal issues (those already causing division) to further widen the divide. Niche, receptive audiences may be targeted to aid in dissemination (Udupa, 2023). Here, the Cambridge Analytica scandal is often referenced to demonstrate how online audience segmentation techniques can be used for strategic, divisive campaigning (Till, 2021). Certain issue publics (gathered through Facebook ad keyword searches) were targeted and engaged to join in the messaging (Venturini & Rogers, 2019).

In both cases, the ampligandists are social media users who act not only as spreaders but also as creative producers in their "dark participation" (Quandt, 2018). They share posts and contribute to memes befitting the vernacular cultures of the platforms to which they contribute.

It is important to state that participatory propaganda spaces are distinct from other space types discussed above in that they do not obscure or cloak activities to make them appear authentic, at least when operated by social media users who are identifiable. One could argue that their success could be measured by their distance from (or lack of co-mingling with) actors characteristic of the other space types: alternative network influencers, fake news manufacturers, and coordinators of inauthentic behavior. Indeed, these characteristics make them more difficult to study because they have fewer markers beyond those of everyday users (Lewandowsky, 2022). They may reference and share similar themes and materials; however, this is how the study of these spaces may be approached.

Studies concerning participatory propaganda thus concentrate on the narratives and cultural products they circulate and create, looking for thematic clusters and memetic participation in the form of image production or phrasal memes (Tuters & Hagen, 2020). How are Ukrainian war refugees discussed and depicted on social media? Can it be considered propagandistic? Are they predominantly circulated by users who are identifiable and not known to spread disinformation?

Alternatively, to study participatory propaganda, one could focus not on the content's ordinariness, but on the actors behind it, seeking to shorten the distance between participants and the seeding parties and to uncover the origins. This approach assumes that participatory propaganda is likely not organic and that behind it lies the "digital influence industry" (Briant, 2023). Here, one looks for signs of astroturfing, micro-targeting, and similar digital influencing tactics, connecting them or, at least, the content to the seemingly organic participatory propagandists (Grohmann & Corpus Ong, 2024).

Mapping out the substantive connections between the “masters” and the participatory propagandists could conceivably be approached in the study of post-truth spaces, as we discuss. These spaces may comprise one or more of the actor types discussed so far and may include differing constellations of them. The approach also studies the distance between clusters, evaluating the extent to which these spaces overlap with others, including more mainstream ones. Are they distinctive or so similar that they cannot be disentangled? In the latter case, post-truth contents have diffused, an indicator of the campaign’s success.

Post-Truth Spaces Online

Post-truth spaces are defined here as clusters of densely interlinked web pages or public social media groups, pages, and accounts that are either difficult to verify or recognized by verification experts as sources of disinformation. These demarcated spaces in a network sense may also be populated by actors from the space typology outlined above—such as alternative political influencers, fake news manufacturers, inauthentic behavior coordinators and more bottom-up amplifiers.

At least two avenues for analyzing post-truth space are proposed here. The first involves examining actor constellations and the extent to which they include sources from distinct space types. Is the space primarily organized by well-known alternative political influencers, or does it feature sources whose provenance is difficult to verify? The second line of study concerns their overlap, proximity, or penetration into mainstream clusters. Are identifiable post-truth spaces marginal or more central? The intermingling of fringe and mainstream elements would indicate the influence or impact of a post-truth space.

Both approaches are applied in the Moldova case study, described below, where we test the mapping technique, use digital investigation methods, and propose an influence metric to measure impact. Additionally, we discuss the practical use of the post-truth space mapping method for fact-checkers.

Moldova: Case Study

The Russia-Ukraine war has been accompanied by influence operations orchestrated by many parties. Our scholarly focus is on Eastern Europe, particularly former Soviet republics and Eastern bloc countries, often with significant Russian-speaking populations, such as Moldova.

Described in peace and security policy circles as “divided between pro-European integration and Soviet nostalgia” (Dvornikova, 2020, p. 30), Moldova has been found to be a target of disinformation. Indeed, it faces “intense, aggressive and constant (. . .) propaganda by pro-Russian forces,” which comprises both external and domestic actors (Muravski, 2024, p. 3). Media monitoring reports by local watchdog organizations indicate that, until a 2022 ban, Russian stations dominated Moldovan television in ratings, and that such content is now most prevalent on social media, particularly Facebook, Telegram, and TikTok (Revenco, 2024). Pro-Russian and anti-EU/NATO content are also propagated by minority pro-Kremlin political parties, including Shor (the party of the oligarch, Ilan Shor), which was banned.

At the time of the mapping, Moldova had been preparing for presidential elections, which also included a referendum that, if adopted, would put the country on the path toward integration in the European Union. Given the stakes, area experts highlighted increased Kremlin-orchestrated information operations that aligned with pro-Kremlin minority parties (Panainte & Culeac, 2024). Following the revocation of Russian TV station licenses and the banning of websites in 2022 and 2023 for spreading disinformation, information operations are now deployed through social media and the remaining pro-Kremlin media outlets in Moldova.

Whether these influence operations may be located is one question. Another is the extent of their co-mingling and intersections with more mainstream political discourse, including the majority, pro-European party and political movement. Are there post-truth spaces that stand alone, intersect with fringe domestic actors, or integrate into other more mainstream (or non-fringe) spaces? Influence becomes a measure of these proximities and intersections.

Post-Truth Space Mapping Method

Our analysis conducted against the backdrop of upcoming elections, pro-European integration campaigning, and pro-Russian and Kremlin-backed counter-campaigning, concerns the war on the doorsteps. It begins with a list of war-related keywords queried in CrowdTangle, the Facebook data source, which returned posts containing these keywords, along with accounts, pages, and groups that posted them (see Figure 1). We chose Facebook not only because of its significance as a source of Russian disinformation discussed by the local watchdog (Revenco, 2024) but also because it is by far the most used social media platform in the country (Statcounter, 2024).



Figure 1. Post-truth space mapping technique protocol.

Next, we tidy the data by shortening URLs so that each web page URL is reduced to its domain, while Facebook native links are resolved to a page or an individual public account. In Gephi, the network analysis and exploration software, we apply ForceAtlas2 and modularity algorithms to detect communities of sources (accounts, pages, or groups) sharing URLs (Jacomy, 2021; Jacomy, Venturini, Heymann, & Bastian, 2014). Applying visual network analysis, we adjust the spatialization settings to produce clusters (and holes) (Decuypere, 2020; Venturini, Jacomy, & Jensen, 2021).²

² In Gephi we set the weighted in-degree ranking to a minimum of 5 (and maximum of 50), the ForceAtlas2 gravity setting for spatialization tuning to 0.005 and the edge weight to 0.47 (hiding thinner edges). We also used Gephi's modularity feature (Louvain method) for community detection.

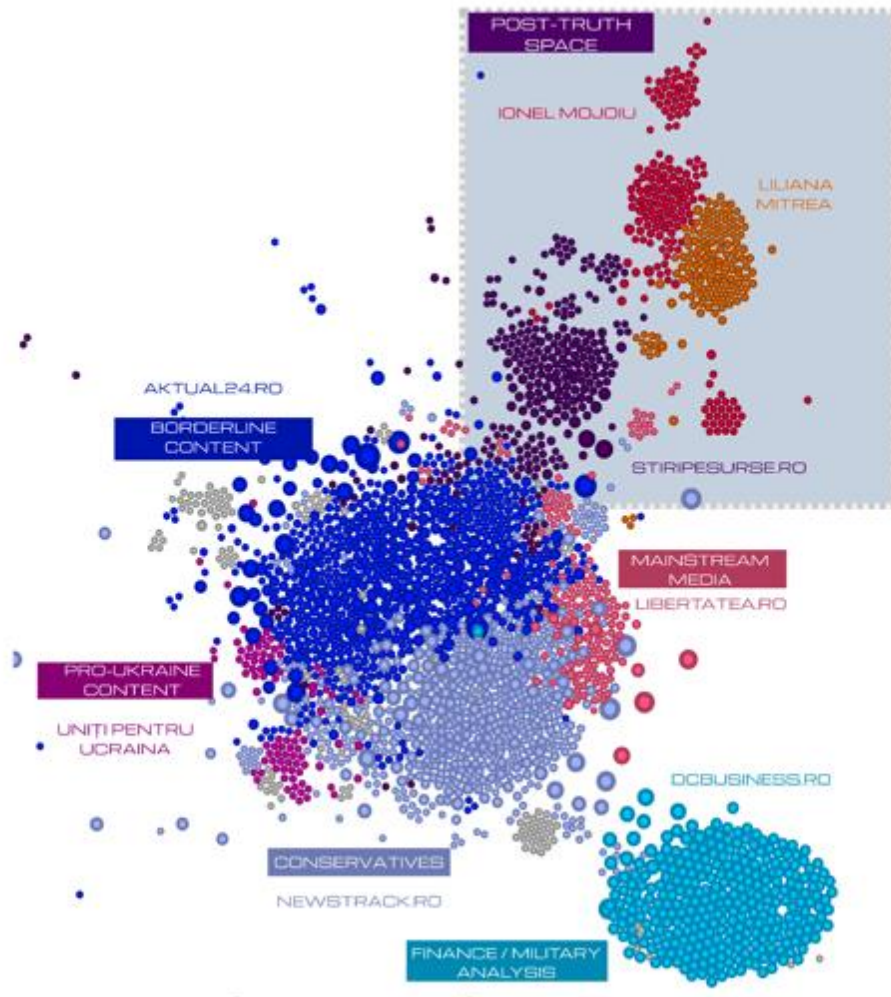


Figure 2. Russia-Ukraine war-related clusters from the Moldova Facebook, March 2023.

Through this approach, we map a Russia-Ukraine war space on Moldovan Facebook, identifying distinctive clusters. We dub three proximate clusters as “post-truth,” as they are dominated by nodes that are either difficult to verify, known disinformation purveyors, or aligned with the alternative space typology, as described above (see Figure 2).

Finally, we calculate an influence measure by assessing post-truth cluster penetration into other clusters. We calculate the interpenetration between these clusters and the others (through a particular

betweenness centrality measure), leading to observations about the extent to which the clusters have an impact on the larger network.³

Post-Truth Space Mapping Findings

The top nodes in the post-truth constellation are primarily composed of Facebook entities that could be described as propagandists or ampligandists. These clusters are visibly positioned at the periphery of the graph, though at least one extends into the central area. We briefly discuss the top nodes in each post-truth cluster.

One is stiripesurse.ro, which the mainstream outlet Libertatea labels as “alternative media” (Păun, 2022). It has a history of publishing inaccurate information about the Russo-Ukrainian war. For example, after the Bucha massacre, it published an article that denied the crimes in Bucha, referring to the event as an alleged massacre. The site features a special section on the conflict, with articles that share similar positions.

Another is from the Romanian digital creator Liliana Mitrea (with more than 17,000 followers), who could be described as an ampligandist in that her activity consists of resharing posts from other users, creating scant original content. While covering various topics, she frequently includes political commentary, particularly on the East-West divide. One post that garnered shares was an “Open Letter to the U.S. Embassy,” comparing NATO interventions, such as those in Kosovo, with Russia’s actions in Ukraine. The letter also casts doubt on the Bucha massacre.

Another example of participatory propaganda in the post-truth constellation is the activity of Ionel Mojoiu. Like Liliana Mitrea, he is a digital creator, albeit with a smaller follower count (fewer than 10,000). Unlike Mitrea’s profile, we cannot deduce much about him—such as his appearance, where he lives, or whether he has any relatives. His national sentiments are far clearer; he is a member of several pro-Russian groups, including “Support of Great Russia,” “Friends of the Russian Nation,” and “Heart of Russia.” Mojoiu’s activity on Facebook primarily focuses on sharing political content, specifically commentary on military campaigns and conflicts, including the Russo-Ukrainian war. Most importantly, his account launders content from Russian news sites (tass.com, 1lurer.am, lenta.ru) without declaring the sources. At times, the account also spreads false narratives, such as an alleged lawsuit against former NATO chief Jens Stoltenberg.

Apart from the post-truth spaces, there are three other notable clusters. The largest one is what we call the borderline cluster with a mix of news sources, some problematic, others less so. Its largest node is Aktual24.ro, a tabloid-like news site that has been placed on the list of disinformation providers by the Romanian National Directorate of Cyber Security (Albu, 2022). This list includes the Russian state source, Sputnik, whose operations in Europe were suspended by the European Union in March 2022.

³ The influence metric is used to assess how crucial or central each community is within the overall network. For a detailed description of the methodology to derive the influence metric, please see the note at https://osf.io/aw4rk?view_only=5fe05fe1895a47589f7ad717af30234f.

The sources from the Stiri pe surse post-truth cluster that penetrate the Aktual 24 borderline space emphasize how the war in Ukraine (and the shift away from Russian imports) has caused energy bills to rise, leading to financial distress for ordinary households. These and other domestic problems are linked to the conflict.

Another notable bridge from the post-truth space to the borderline cluster is a small community centered around the Facebook Group "Popor dezamagit" ("Disappointed People"), which was created by a page of the same name, whose owner did not complete the verification process according to the Facebook transparency panel.⁴ Both the Page and the Group share a style characterized by tongue-in-cheek posts that portray a country in a dire state, where ordinary people are the primary losers, given the rising energy bills and other pressures associated with the war.

The post-truth clusters and the borderline one differ significantly from the others: the conservative/nationalist, pro-Ukraine, mainstream media, and military analysis spaces are either well-known sources or have markers that allow them to be identified or verified.

Verification Techniques and Cluster Influence Measures

Concerning verification methods, Facebook provides indicators that make pages or accounts difficult to verify. These include account name history showing previous affiliations, a "digital creator" name still set to default, and a verified status that is (long) pending. In the first instance, the account or page name has been changed, and earlier names are without identifying information. In the second indication, accounts may monetize opportunities, but the default digital creator name has not been replaced with the creator's actual name. Finally, a third indicator is an incomplete verification status. That is, for the verified status to be approved, Meta has asked for additional verification information, but it has not been provided. The page or account remains online while that update is pending.

To measure the extent of the impact between different node groups, we developed a cluster (or community) betweenness metric, which we used as a proxy for influence (see Table 1). This allowed us to gauge the extent to which the information shared in post-truth spaces extended into other clusters. Higher betweenness signifies that a cluster is positioned between most non-post-truth communities, indicating greater centrality and influence. For our network, we found that all post-truth clusters have low betweenness, indicating low centrality and thus minimum impact within the overall network, though they supply bridges to the most significant (borderline) cluster.

⁴ The page has since been deleted.

Table 1. Betweenness Centrality Measures of Each Community in the Network, Together With its Top Node.

Community	Betweenness
Post-truth (Stiri pe surse)	76.39
Post-truth (Liliana Mitrea)	12.73
Post-truth (Ionel Mojiu)	11.14
Conservatives (Newstrack.ro)	1768.29
Borderline (Aktual.24.ro)	2567.10
Finance/military analysis (Dcbusiness.ro)	1611.55
Mainstream media (Libertatea.ro)	1798.77
Pro-Ukraine (Uniti pentru ucraina)	1661.34

The borderline cluster has the highest level of betweenness, suggesting that a significant amount of the conversation about the Ukraine war is not driven by spaces labeled as more mainstream media, but by nodes that straddle the post-truth spaces.

For fact-checkers and other verification specialists, this finding would be significant as a lead. According to the metric, the sources in the borderline content cluster have considerable sway and are linked (through shared content) to the post-truth space. Given the findings from the post-truth space mapping, these are sources that could be added to curated lists; their stories would be worth monitoring.

Conclusions: Post-Truth Spaces, Authenticity, and Influence

Conceptually, post-truth spaces are demarcated sets of interacting and inter-referencing actors working to advance programs to assert political influence. The post-truth descriptor was chosen because of the substance of the information intervention, be it termed alternative facts or problematic information.

The post-truth space is, among other alternative spaces of interest online, identified as problematic and potentially influential, warranting detection and measurement to provide leads for fact-checkers and verification specialists. These include the alternative influence network, fake news engagement space, coordinated inauthentic behavior campaigns, and participatory propaganda.

The alternative influence network consists of Internet personalities on YouTube, often extreme, who have been described in the original mapping as reactionary toward U.S. liberal politics (Lewis, 2018). Fake news engagement spaces are those populated by political clickbait, often for money-making purposes. Coordinated inauthentic behavior campaigns consist of masked actors working together to make content appear popular online. Participatory propaganda blurs the master source of a campaign because it appears that everyday users are improvisationally creating and spreading the content of a particular program.

Each of these spaces may be demarcated. Alternative influence networks on YouTube are co-appearance or co-collaborative networks of influencers appearing on each other's videos or co-authoring content. Fake news engagement spaces—identified through election-related or other thematic keyword queries—are characterized by competition between fake and mainstream news. Coordinated inauthentic

behavior campaigns are detected by traces of actors working in concert over time to make online posts appear popular. Participatory propaganda, lastly, is problematic content created and spread by everyday users with no palpable master source.

Having situated the post-truth space among these other spaces, we conducted a case study to locate them on Moldovan Facebook in the context of the Russia-Ukraine war. The first demarcates a discursive space through related keyword queries. Subsequently, we undertook a network analysis where the sources (nodes) sharing the same URLs (edges) were mapped out using visual network analysis to separate the clusters. In the analysis, the post-truth space was characterized as such because it contains known disinformation spreaders, as well as those difficult to verify (through digital investigation techniques), and that represent a specific point of view. While these pages, groups, and accounts reference many of the same sources, their URLs are rarely shared outside their clusters, though there are bridges to a significant cluster found to contain (pro-Russian) borderline content. Indeed, when measuring the extent of the overlap with other clusters, which we describe as an influence metric, the post-truth spaces have limited degrees of intersection. The cluster containing borderline content, however, is the most influential in the entire network and is proximate to the post-truth spaces.

Sources in post-truth spaces are of interest for further analysis by fact-checkers and verification specialists, who may add them to their curated lists of sources to monitor or peruse for stories to be fact-checked. Future work should be oriented toward sharing these techniques for further evaluation and expanding case study treatment across Eastern Europe and beyond.

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