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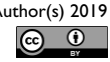

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‘Fake news’ as infrastructural uncanny

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Abstract

In this article, we examine how the social disturbance precipitated by ‘fake news’ can be viewed as a kind of infrastructural uncanny. We suggest that the threat of problematic and viral junk news can raise existential questions about the routine circulation, engagement and monetisation of content through the Web and social media. Prompted by the unsettling effects associated with the ‘fake news’ scandal, we propose methodological tactics for exploring (1) the link economy and the ranking of content, (2) the like economy and the metrification of engagement and (3) the tracker economy and the commodification of attention. Rather than focusing on the misleading content of junk news, such tactics surface the infrastructural conditions of their circulation, enabling public interventions and experiments to interrogate, challenge and change their role in reconfiguring relations between different aspects of social, cultural, economic and political life.

Keywords

Digital methods, fake news, infrastructure studies, Internet studies, like economy, link economy, platform studies, science and technology studies, sociology of quantification, uncanny studies

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Figure 1. LeSoir.info in February 2017 (left) and LeSoir.be in March 2017 (right).

Infrastructural concerns

Double trouble: fabricating Le Soir in 1943 and 2017

In August 2017, *The Guardian* published an article about 'fake news twins', 'Doppelgänger' and 'lookalike' sites with near-identical domain names and appearances to news websites such as *Al-Jazeera, The Atlantic* and Belgian *Le Soir*, which were used to spread false and misleading claims (*The Guardian*, 2017). A 'clone' of *Le Soir*, for instance, was used to propagate false claims about presidential candidate being financially backed by Saudi Arabia (Figure 1; CrossCheck, 2017).

Interestingly, this was not the first time that a 'second *Le Soir*' was in circulation (Istas, 1993). In November 1943, Belgian resistance movement Front de l'Indépendance circulated an elaborate satirical fake issue of *Le Soir* which took aim at Hitler, Nazis and Belgian collaborators, complete with fabricated advertisements, events and obituaries (Figure 2). The '*Faux Soir*' made its way into official distribution channels and was sold through kiosks in Brussels.

Both cases involved meticulous reproduction of visual and editorial conventions of *Le Soir* which would make them 'passable': typefaces, images and layout. However, it is not just resemblance in content that we want to draw attention to but also the different infrastructures involved in their production, distribution and monetisation. The 1943 '*Faux Soir*' depended on printing machinery, typesetting and scarce paper supplies, as well as volunteers who sabotaged distribution vans and put their own copies into kiosks at particular times to catch workers on the way home.

The copycat *Le Soir* of 2017 required a domain name, skills to clone the site and the means to distribute it on social media and other online 'spaces', including a posting on

Figure 2. *Le* '*Faux Soir*' in 1943 (left) and *Le Soir* in 1938 (right).

a far-right website and a tweet from Marion Maréchal-Le Pen (grand-daughter of the founder of far-right party Front National). While these were both removed shortly after publication (CrossCheck, 2017), the website continued to be discussed and shared online both as *evidence of the article's claims* and as *debunking of misleading information*. While the 1943 double was shut down, equipment was destroyed and people were arrested, the 2017 fabrication remained freely available online, the infrastructures sustaining its circulation being uncannily indistinguishable from those of the original.

'Fake news' as infrastructural uncanny

Both cases of fabricating *Le Soir* in 1943 and 2017 involved interventions around particular sociotechnical arrangements through which news is made available to its readers, which can be understood as infrastructures. The phenomenon of 'fake news' problematises not only what is said but also the very conditions of sayability: the digital infrastructures that mediate the circulation of online content. In this article, we examine how 'fake news' can render such infrastructures problematic. We focus on the notion of the 'infrastructural uncanny' as a way to characterise the anxieties and questions that emerge in relation to the farming and circulation of junk news (Howard et al., 2017; Venturini, 2019; for discussions of junk news in the context of professional journalism see Harrington, 2008; McCartney, 1977).[1]

The infrastructural uncanny prompted by junk news can be seen not just as a quandary but also as an opportunity. As Nicholas Royle (2003) argues, the 'critical elaboration [of the uncanny] is necessarily bound up with analysing, questioning and even transforming what is called "everyday life"' (p. 23). To give a recent example from uncanny studies, Lepselter (2016) argues that theories about aliens and conspiracies bear the trace of the unsettling effects of colonialism and downward social mobility.

To illustrate how the uncanny arises in relation to digital infrastructures in situated contexts of use, we draw on to approaches from uncanny, infrastructure and new media studies. We propose that junk news may be taken not just as an opportunity to fix platforms and to strengthen expert-centric knowledge cultures (Marres, 2018) but also for public experiments to interrogate, challenge and change how these infrastructures participate in economic, cultural and political life. In this sense, we treat it as an 'empirical occasion' in which the relations between publics, claims, content producers, advertising markets, investors and others through digital platforms become *visible and accessible for social analysis and societal debate* (Marres, 2013, 2015, 2017).

To this end, we present three 'scenographies' (Latour, 2008) examining infrastructures and practices involved in ranking content, metrifying engagement and commodifying attention. These draw on methodological recipes in *A Field Guide to 'Fake News' and Other Information Disorders* (fakenews.publicdatalab.org), a Public Data Lab project that we co-investigated in collaboration with a network of researchers, students and practitioners (Bounegru et al., 2018). Such recipes may be of interest not just for their analytical capacities (in producing knowledge about the social) but also for their interactive capacities 'in order to gauge the affordances of digital settings for more responsive, engaged or creative styles of social enquiry' (Marres, 2017).

Infrastructure studies and uncanny studies

The term 'infrastructure' has a rich history and has been put to work in different ways by practitioners and researchers (Peters, 2015). We draw on a set of critical approaches associated with 'infrastructure studies' (Bowker et al., 2009; Bowker and Star, 2000; Edwards et al., 2009; Larkin, 2013; Star, 1999; Star and Ruhleder, 1996), and in particular the view that infrastructures may be viewed in terms of relations rather than as things (Star, 1999).

The scenographies below complement recent interest in how platform studies and infrastructure studies might learn from each other (Helmond, 2015; Plantin et al., 2016). The layering and pastiche of web components and social media channels, each with their own dependencies and histories, perhaps affirms the suggestion that 'growing' rather than 'building' may be a more appropriate metaphor for understanding the dynamics of digital infrastructures as distributed, collective accomplishments (Jackson et al., 2007). Platforms attempt to accommodate a wide variety of use scenarios, by decentralising programmable platform features and centralising platform data (Helmond, 2015). Junk news content suggests some of the ways in which these platforms and infrastructures may have unintended effects.

As Edwards (2003) puts it, one of the notable characteristics of these 'circulatory systems' is they are '*not* salient for most people, most of the time' and 'reside in a naturalised background, as ordinary and unremarkable to us as trees, daylight and dirt' (p. 185). While they are a fundamental characteristic of contemporary life (such that 'to be modern is to live within and by means of infrastructures'), Edwards (2003) argues along with Star and others that 'we notice them mainly when they fail, which they rarely do' (pp. 185–186). Infrastructures can become visible in different ways, including in breakdown (Star, 1999) and failures to align with expectations (Gray et al., 2018). In the case of 'fake news', digital infrastructures became salient as 'matters of concern' (Latour, 2004) not just due to *breakdown* or *failure*, but rather because of success in ways other than hoped for.

We draw on the notion of the infrastructural uncanny to characterise some of the unusual, concerning, and unexpected effects that infrastructures may give rise to. This notion has been proposed by Geoghegan (2016) to refer to 'a range of unsettling phenomena that tend to emerge in periods of rapid expansion in the means of technological conveyance' (p. 900). Taking cue from this starting point – which arises in relation to the emergence of spiritualism in parallel with infrastructures such as railways, telegraphs and canals in the 19th century – we explore how the uncanny may also be apt for the study of digital infrastructures.

The uncanny has been described as a 'master trope' in cultural studies and other fields in the 1990s (Jay, 2012; cf. Collins and Jervis, 2008; Royle, 2003). It was partly popularised by the reception and influential engagements with Freud's (2003) 1919 essay on *Das Unheimliche*: literally the 'unhomely' and usually rendered as 'uncanny'. Freud quotes Schelling's suggestion that the uncanny is 'everything that was meant to remain secret and hidden and has come into the open' (p. 132). He argues that the uncanny is not simply the unfamiliar, but the 'species of the frightening that goes back to what was once well known and had long been familiar' (p. 124), referring to examples of automata and

the agency of inanimate objects which come alive (p. 135) and the figure of the double or *Doppelgänger* (p. 141). Freud's text responds to an essay by Jentsch emphasising the relationship between the uncanny and the habitual (Jentsch, 2008: pp. 218–219). Heidegger uses the concept as a means to 'recognize and thematize what we ordinarily take for granted' (Withy, 2015: 3).

Hoffmann's short story '*The Sandman*' is considered paradigmatic of the uncanny by Freud and many others. It mobilises a number of ambiguities, such as whether characters of Coppelius and Coppola are the same person, the status of an automaton called Olimpia, and whether characters are human or not, which drives the protagonist, Nathaniel, to madness.[2] A recurring theme in the story is the perception of similarities, and the uncertainty about how to resolve ambiguities in apparent resemblance. For the purposes of this article, it is worth noting the role of the telescope, the device which facilitates the experience of uncanny similarity between the automaton Olimpia and Nathaniel's fiancée Clara, by viewing them from a distance. Likewise, it is the taken-for-granted *mediating capacities* of digital infrastructures – to commensurate, quantify, order and assemble – which give rise to uncanny effects in the case of 'fake news', prompting uncertainty and concern.

It has been suggested that the uncanny can be understood as a 'distinctively *modern* experience' arising in relation to emerging configurations of science, technology and urbanisation (Collins and Jervis, 2008), as well as a 'response to the regime of the programme' as embodied in ambient information and communication technologies (Johnson, 1999). Several scholars have explored the notion of the 'digital uncanny', arguing that we should attend to how the uncanny may be re-articulated through different media technologies (Coyne, 2005; Ravetto-Biagioli, 2016). Ravetto-Biagioli (2019) argues that with digital technologies, the uncanny may exceed the 'emotional intensity or embodied perception' that was the focus of earlier psychoanalytical readings, instead 'forcing us to reflect on our relationship with computational media'. The case of junk news suggests that it is partly the agential capacities of digital infrastructures to configure, multiply and redistribute habits and relations in unexpected ways which generate unsettling ambiguities. While earlier studies focused on dichotomies of self/other, animate/inanimate, living/dead, familiar/unfamiliar, more recent work explores how the uncanny may be used to inquire into the unsettling of space, architecture, technologies and media systems (Collins and Jervis, 2008; Vidler, 1994).

As well as uncanny doubles and copies (Schwartz, 1998), the uncanny may also emerge in relation to the unsettling effects and ambiguities that emerge from the participation of sociotechnical devices in the online circulation of content, including algorithms, metrics, digital analytics, links, ads, content management systems and social media platforms. Commentators warn of 'empathically optimised automated fake news' (Bakir and McStay, 2018) and 'reality apathy' resulting from of destabilising combinations of machine-learning, bot-amplification, video manipulation and online platforms (Warzel, 2018). The very same platforms and infrastructures which have been celebrated for broadening access to and involvement in the production of content, have become agents of 'information disorder' (Wardle and Derakhshan, 2017).

The infrastructural uncanny manifests when the role of sociotechnical devices in the co-production of value, engagement, audience and social relations becomes unsettling

and generates ambiguities such that the way in which agency is distributed becomes difficult to untangle. For example, infrastructures for metrifying engagement may make it unclear whether likes or posts of junk news are the result of bots, algorithms, paid propagandists, remote entrepreneurs or grassroots political activists. Agential ambiguities associated with the infrastructural uncanny can provide opportunities for alternative ways of accounting for and responding to troubling phenomena in digital societies.

Infrastructural scenographies

> A matter of concern is what happens to a matter of fact when you add to it its whole *scenography*, much like you would do by shifting your attention from the stage to the whole machinery of a theatre. (Latour, 2008)

In this article, we take the infrastructural uncanny as an occasion for examining the role of various digital devices in organising content online. In so doing, we aim to extend the frame to account for not just problematic content but also the infrastructures through which it circulates, drawing on the *Field Guide to 'Fake News' and Other Information Disorders* (Bounegru et al., 2018).

The guide explores digital methods (Rogers, 2013) as a site for public involvement around junk content farming and circulation. Digital methods are informed by a sensibility that methods are not just means for understanding social life, they are also an important part of it (Garfinkel, 1984). Indeed, online platforms have their own 'baked in' methods and infrastructures for tracing, quantifying, intensifying and valuing the activities of users. These methods can be repurposed in order to examine the interactions between social practices, digital devices and knowledge production (Marres, 2017). In the spirit of both 'critical analytics' (Rogers, 2018b) and 'inventive methods' (Lury and Wakeford, 2012), we utilise data from online platforms and devices in the service of quali-quantitative accounts of both the platformised fabric of the web and the online activity which it enables. This means that researchers need to actively work to align device affordances with their own questions (Marres and Gerlitz, 2015; Venturini et al., 2018a). Through such analysis, we examine both dominant modes of counting, accounting for and ordering online content and the trouble that accompanies them.

Drawing on Latour's (2008) notion of 'scenographies' which signals a shift from standalone 'matters of fact' to the conditions of their production, we propose methodological tactics for exploring the trouble of junk news. Our scenographies highlight how banal and habitual infrastructures (Chun, 2016) which have been adopted as methods for organising and accounting for our social lives (Marres, 2017) play out in the context of junk content farming and circulation. Prompted by the infrastructural uncanny, these scenographies suggest methodological tactics for examining the infrastructural production of troubling 'facts' associated with ranking, metrification and tracking. Drawing on previous digital methods, tools and studies, these scenographies examine how the infrastructural uncanny of junk news arises in relation to (1) the 'link economy' and the ranking of content (Rogers, 2002), (2) the 'like economy' and the metrification of engagement (Gerlitz and Helmond, 2013; Helmond, 2015), and (3) tracking infrastructures and the monetisation of attention (Helmond, 2017; van der Velden, 2018).

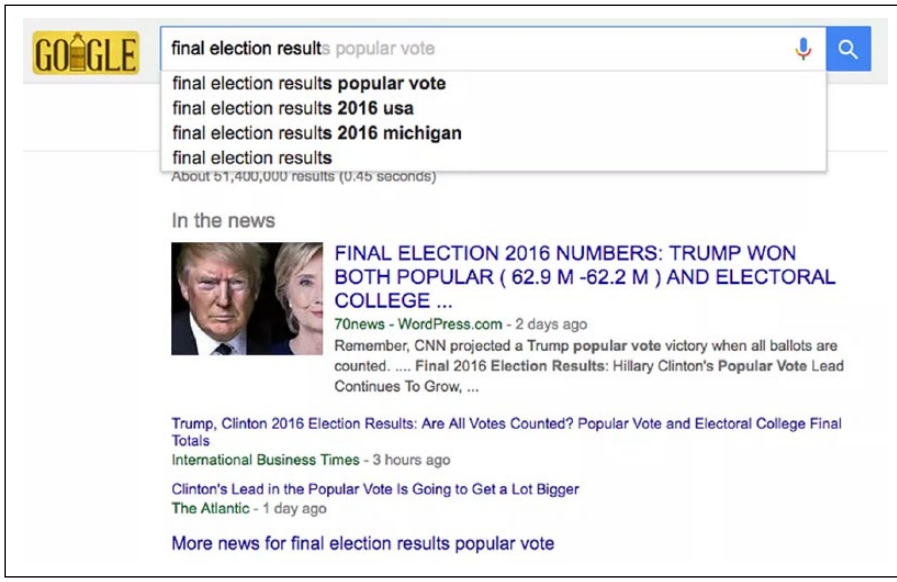

Figure 3. Query for [final election results] on Google Search, CNET, November 2016.

The link economy and the ranking of content

Our first scenography starts with the infrastructural uncanny prompted by the appearance of unwanted deceptive content in top Google search results where one would typically expect authoritative news sources to appear.

Immediately after the 2016 US presidential elections, it was reported that queries such as [final election results] on Google Search returned a story from '70news' at the top of the results suggesting that Trump, rather than Clinton, had won the popular vote (Figure 3). *The Washington Post* (2016) ran the headline: 'Google's top news link for "final election results" goes to a fake news site with false numbers'. PEN America (2017) suggested the incident showed 'the power of search engines to enable the spread of fraudulent news'. As one widely shared tweet put it, 'reality is what people collectively believe' and 'SEO is the new reality' (Raskin, 2016). How had a questionable claim from an obscure blog managed to surpass the country's most well-known media organisations, making it to the top of Google Search results about one of the most prominent political events in the world? Surely this blog alone could not be the only culprit?

In this case, the infrastructural uncanny is not about the story itself, but its positioning at the top of search results. Because of their role in ordering and ranking content search engines can be viewed as 'epistemological machines' and 'a potential collision space for alternative accounts of reality' (Rogers, 2013: 31). The minimalist interface of Google Search has been said to contrast with the complexity and messiness involved in the selection of results (Rogers, 2018a: 7). Google has been criticised both of *not taking enough action* (eg. failing to tackle problematic content); as well as for *taking too much action* (eg. bias, censorship). PEN America (2017) has cautioned against

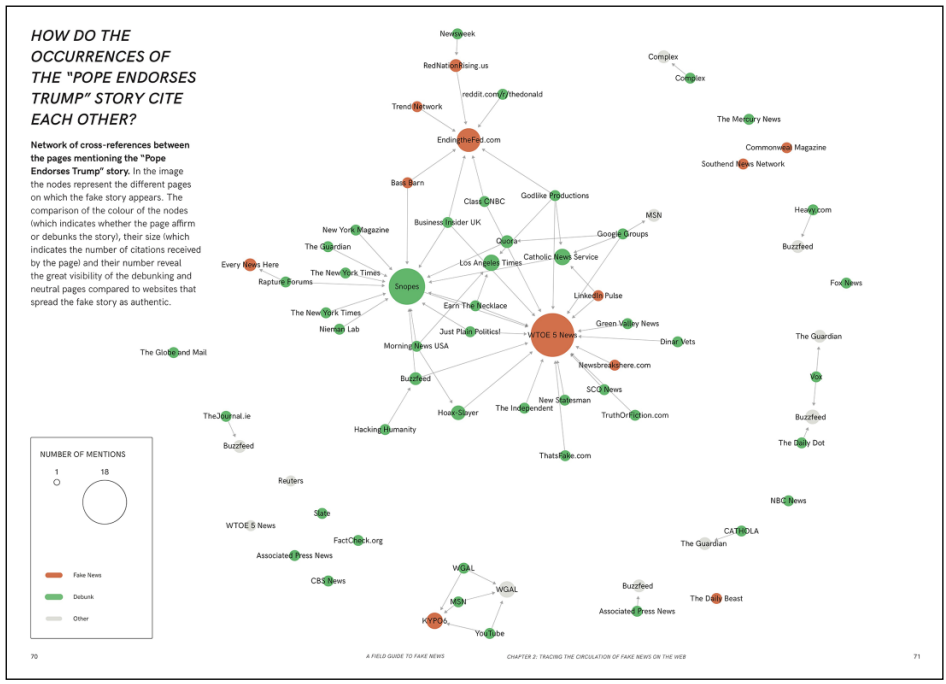

Figure 4. Network graph showing who mentions whom in Google search results in relation to the 'Pope Endorses Trump' story (Bounegru et al., 2018: 70–71).

downplaying the substantive 'moral and intellectual decisions about what content to privilege and what to de-emphasize' (p. 43).

In addition to calls for 'algorithmic accountability' (Diakopoulos, 2015), recent research suggests that the algorithmic ordering of content should be understood as a distributed accomplishment, and that we should aspire to look *across* algorithmic systems as well as *inside* them (Ananny and Crawford, 2016) and consider algorithms *as* culture (Seaver, 2017). Making content orderable involves not only content and algorithms (Rieder, 2012) but also a 'link economy' (Rogers, 2002) building atop of hyperlinks as a specific sociomaterial practice to encode connections between texts (Brügger, 2017). There are also interplays between attempts to rise in the rankings (eg. search engine optimisation), and Google's responses to attempts to 'game' their engine.

Our methodological tactic for this scenography draws on an approach called 'search as research' (Rogers, 2013: 95–124) to examine what is involved in ranking Web content. In particular, we repurpose Google results to explore referencing dynamics at work in the case of the 'Pope Endorses Trump' story, which BuzzFeed News reported to be the most engaged with 'fake news' story prior to the US elections (Silverman, 2016). Using a 'research browser' (Rogers, 2013; Weltevrede, 2016) to mitigate for personalisation, we examined how it appeared in search results in March 2017. After gathering URLs mentioning the story on Google Search, we undertook a qualitative analysis of which sources were associated with the story. Search engine ranking has 'reactive' effects (Espeland

and Sauder, 2007) – including sites refraining from linking to junk news sources so as to avoid boosting the traffic and search engine scores of the latter, as well as to avoid being penalised by search engines themselves. So rather than limit our investigation to hyperlinking practices (cf. Coddington, 2014; Faris et al., 2017; Venturini et al., 2018b), instead we opted for what we called a 'referential network', looking at both hyperlinks and textual references.

A network exploring who mentions whom in relation to the story (Figure 4) suggests that the three most widely cited sources in top Google search results are two junk news sources: WTOE 5 News (now a 'fantasy news website for pet owners') and Ending the Fed (taken down); as well as one fact-checking source: Snopes. Most sources debunk the story (green) rather than affirming it (orange). The network shows a strong presence of established sources, such as mainstream media organisations and fact-checking initiatives.

Five months after the US elections, the link economy co-produced by practices of Google Search and its users seems to privilege the authority of fact checkers and news organisations (who have more visibility than junk news distributors in search engine results and their references). While Google Search reinforces particular modes of link authority, the contrast with referencing practices highlights the 'ghostly' presence of junk news publishers and content despite the absence of hyperlinks and even after they have been taken offline.

Analysing referencing practices over time suggests that references from 'debunkers' may serve to amplify and perpetuate the online presence of this story. We created a timeline to illustrate when pages were published and which other pages they refer (Figure 5). We observed that the original story on WTOE 5 News was hardly referenced for many months and that most of the pages in Google Search results date from after it is 'laundered' (i.e. republished) by EndingtheFed.com. Both websites are widely referenced by debunkers despite the URLs not appearing in search results.

By repurposing search engine rankings to explore referencing dynamics between web pages, this scenography provides a different perspective on the interplay between search engines, hyperlinks and textual references enabling the uncanny appearance of junk content in top search results. It also explores how references to junk news stories may endure even after search engines take remedial action, and how debunkers can perhaps unexpectedly amplify the presence of junk stories.

The 'like economy' and the metrification of engagement

> In the final three months of the US presidential campaign, the top-performing fake election news stories on Facebook generated more engagement than the top stories from major news outlets. (Silverman, 2016)

Our second scenography examines what enables the infrastructural uncanny of junk content apparently overtaking 'real' content, as well as different forms of distributed agency involved in the construction and metrification of engagement – such as bots, paid users and the residual data traces resulting from platform interactions which continue to operate after users have left the screen.

After the US elections, BuzzFeed News ran a piece on 'How Viral Fake Election News Stories Outperformed Real News On Facebook' (Silverman, 2016), including a graph

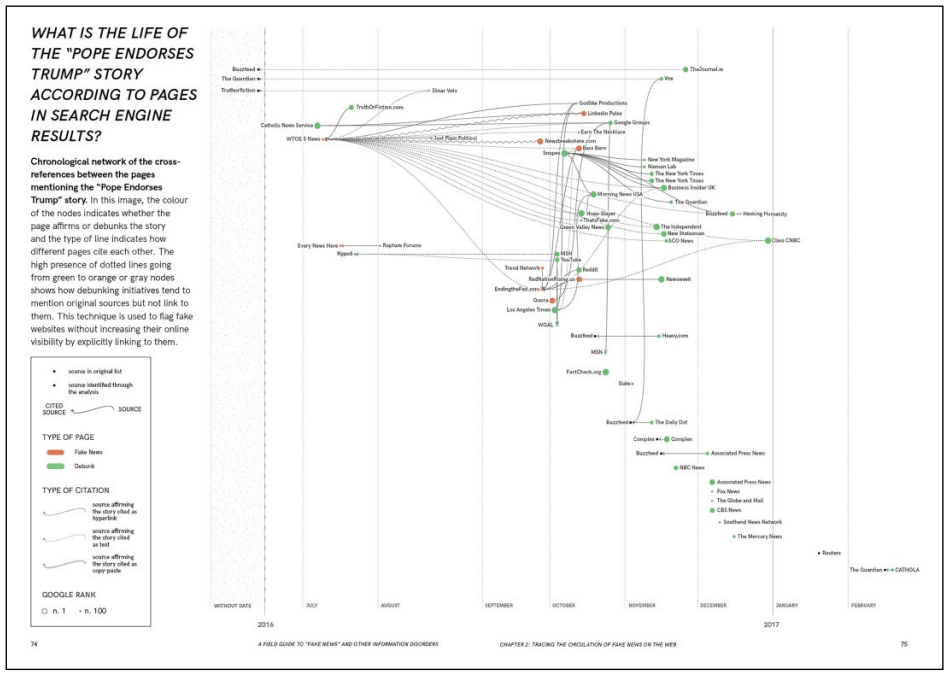

Figure 5. Timeline of sources mentioned in relation to 'Pope Endorses Trump' story (Bounegru et al., 2018: 74–75).

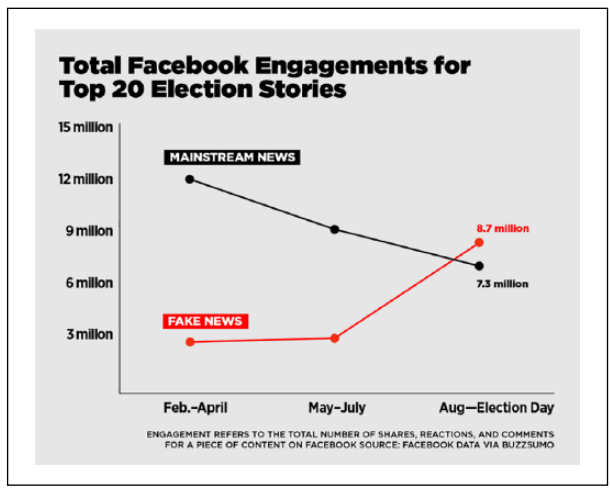

Figure 6. BuzzFeed news chart showing 'fake news' overtaking 'mainstream news' (Silverman, 2016).

showing the red line of 'fake news' about elections overtaking the black line of 'mainstream news' (Figure 6). Such reports were based on a notion of 'engagement' operationalised through an aggregated measure of shares, comments and reactions. The practices of metrifying engagement from which BuzzFeed's analysis derives are made possible as a result of platforms such as Facebook being positioned as a kind of 'social infrastructure' (Zuckerberg, 2017), bringing about a shift from modes of valuation associated with the link economy to those associated with the like economy (Gerlitz and Helmond, 2013). Though both links and likes are used to quantify audiences 'as socially constructed by media industries, advertisers, and associated audience measurement firms' (Napoli, 2010), they are associated with different forms of quantification and valuation.

This has given rise to concerns about fabricated, manipulated and misleading engagement scores to spread 'fake', spammy and scammy content through 'like farms', 'like fraud' and 'fake likes' (De Cristofaro et al., 2014; Farooqi et al., 2017; Ikram et al., 2017). Such phenomena can raise fundamental questions about the character of engagement such as whether it is 'real' or 'fake', actual or potential, organic or manipulated, human or bot generated. How engagement is mediated, organised and made intelligible matters in different ways for investors, advertisers, propagandists, journalists, page administrators and users. While the like economy aims to make diverse activities commensurable under a common set of metrics (Espeland and Stevens, 1998), to paraphrase Gerlitz and Rieder (2018), not all likes and shares are created equal.

Starting with 22 stories from BuzzFeed's list (Silverman, 2016), we used the CrowdTangle tool to look at public Facebook pages and groups in which they were posted.[3] This provided a different perspective to aggregated metrics, unpacking how engagement was organised on Facebook as well as what mobilised engagement, including which pages and groups share junk news stories and how much, as well as what these groups were about (Figure 7). While the stories were about elections, we found that the groups were not just about electoral politics but also a wide range of other topics and issues such as entertainment ('Movie Quotes'), clickbait ('All Viral Videos'), cultural institutions ('Los Angeles Punk Museum') and music ('The Guitar Mag'). In contrast to aggregated engagement metrics, page- and group-level views show how junk news content serves to gather and mobilise audiences for different purposes.

As fact-checking has been positioned as one of the major responses to junk news (including through partnerships between big technology companies such as Facebook and Google), we examined whether debunking content is acknowledged by pages and groups that share junk stories. To this end, we took a list of URLs from fact-checking initiatives and used the CrowdTangle browser extension to see to what extent fact-checking responses were shared in the same spaces that the stories circulated (Figure 8). We found that it was very rare for pages that shared junk news stories (orange) to also share fact-checking corrections (titles of pages that share both stories and fact-checks are marked in red).

Prompted by the infrastructural uncanny of junk news surpassing mainstream news content in aggregated engagement metrics, we repurposed lists of highly engaged pages in order to explore the sociotechnical organisation of engagement on Facebook. This suggests the many different roles that junk content serves to mobilise and assemble audiences through platform features such as public pages and groups, as specific ways of 'making people up' (Hacking, 1985) and 'inventing the social' (Marres et al., 2018). While social media

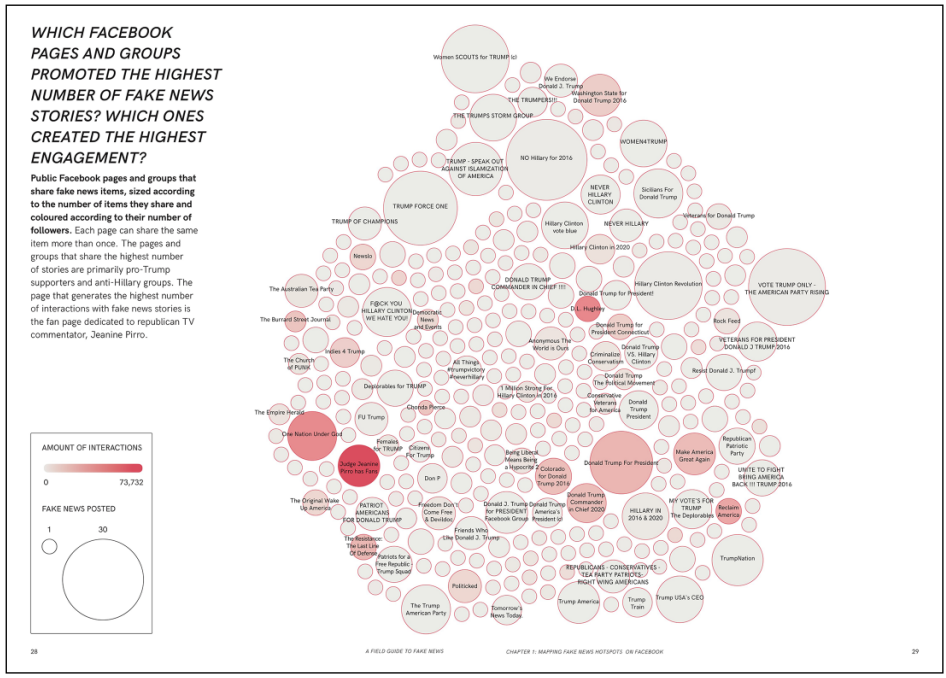

Figure 7. Public pages and groups which share junk news (Bounegru et al., 2018: 28–29).

platforms conspicuously reinscribe 'classic social formations' such as friendship networks and community groups (Marres and Gerlitz, 2018), the infrastructural uncanny of unsettling metrics surfaces the comparatively inconspicuous participation of nonhuman actors such as platform features, junk content, bots and algorithms in the co-production of social life.

Tracking infrastructures and the commodification of attention

> This is the arrhythmic, disturbing heart of the affair: that the internet made it so simple for these young men to finance their material whims and that their actions helped deliver such momentous consequences. (Subramanian, 2017)
>
> Russia, Romania and Macedonia are known to be the source of much of the fake news on the internet. (Dell, 2018)

Our third scenography focuses on the infrastructural uncanny that arises from the unanticipated effects of web economies. In particular, we examine the unexpected participation of distant and not so distant content producers in domestic politics enabled by online advertising industries for monetising digital content through the commodification of attention.

After the 2016 US elections, journalists reported on how teenagers from a small Macedonian town were making money through political clickbait about American politics (Subramanian, 2017). Investigations have raised doubts about whether their activities were spontaneous or orchestrated (Cvetkovska et al., 2018). The economic success

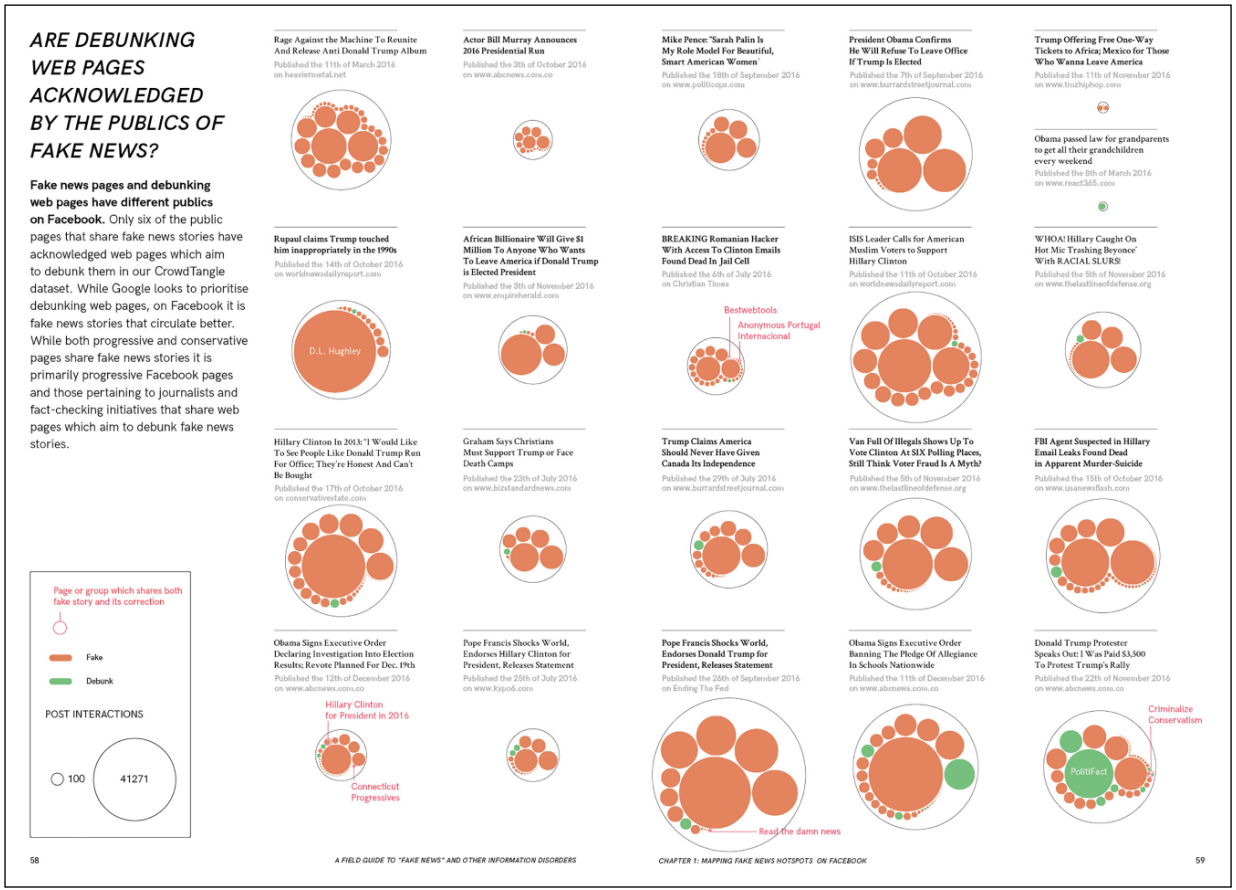

Figure 8. Analysis of which public groups where 'fake news' is shared also acknowledge fact-checking and debunking pages (Bounegru et al, 2018: 58–59).

of such viral content farming is said to depend on the combination of low-cost clickbaity content production, with what in advertising is known as 'click arbitrage'. This notion refers to buying website traffic cheaply through advertising on platforms such as Facebook so that revenue can be made through ad networks such as Google's AdSense (Nickel, n.d.; cf. Dewey, 2016; Silverman and Alexander, 2016; Subramanian, 2017).

While debates about the economics of junk news have focused on sanctioning disreputable publishers by blacklisting them from ad networks and flagging their content on Facebook, in this infrastructural scenography, we extend the frame from problematic sources to the networks involved in capturing, measuring, calculating and monetising audiences. Researchers have argued that online audience marketplaces (Napoli, 2010) have become increasingly complex as exchanges between supply and demand sides of advertising inventories are enabled through an increasingly large number of interdependent intermediaries, including ad networks, ad exchanges, data brokers and online platforms (Nieborg, 2016; Turow, 2011).

The methodological tactic in this scenography is to extract data on third-party-tracking infrastructures from both mainstream and junk news sites to explore the online audience marketplaces that underpin them. As we will show, this analysis re-does the spatiality of junk news from a focus on Macedonian, Romanian or Russian towns right back to the backyards of targeted countries. It reframes the problem as not just one of remote producers of troubling content but rather as one of transnational audience marketplaces that link what Marres (2018) ironically calls 'undisciplined youth from out of town' with home-grown online advertising and marketing industries.

Online audience marketplace configurations are enabled by an 'invisible data mining infrastructure' of cookies, beacons and other devices which enable user behaviour to be tracked in site and across the web by establishing data flows between websites and various third-party services (Gerlitz and Helmond, 2013). With the caveats that web tracking is not just for advertising and that audience marketplaces involve more than just web trackers, in this scenography, we draw on Callon and Muniesa's (2005) notion of markets as 'calculative collective devices' (Callon et al., 2007) to attend to the work that web tracking does to materialise relations, exchanges and data flows.

We use a corpus of 19 US-based mainstream news sites and 19 junk news sites from a list compiled by BuzzFeed News (the homepage and five popular article pages per site) to identify third-party-tracking devices embedded in successful content from these sites using the Digital Methods Initiative *Tracker Tracker* tool. The tool repurposes the Ghostery browser extension to compare the presence of trackers across the websites (van der Velden, 2018) and to study their 'tracker networks' (Helmond, 2017). We used Gephi to visually explore tracking networks, in which junk and mainstream news sites are embedded through a force-directed spatialization technique (Jacomy et al., 2014) so that the distribution of nodes in the network can be interpreted as 'a proxy of their structural similarity' (Venturini et al., 2017, p. 4).

The resulting network (Figure 9) does not suggest a sharp, binary distinction between the tracking practices of mainstream and junk news producers but rather a range of different audience marketplace configurations which they share and through which they can be differentiated. This includes configurations common to smaller-scale operations covering a large proportion of junk content URLs (pink); as well as highly customised

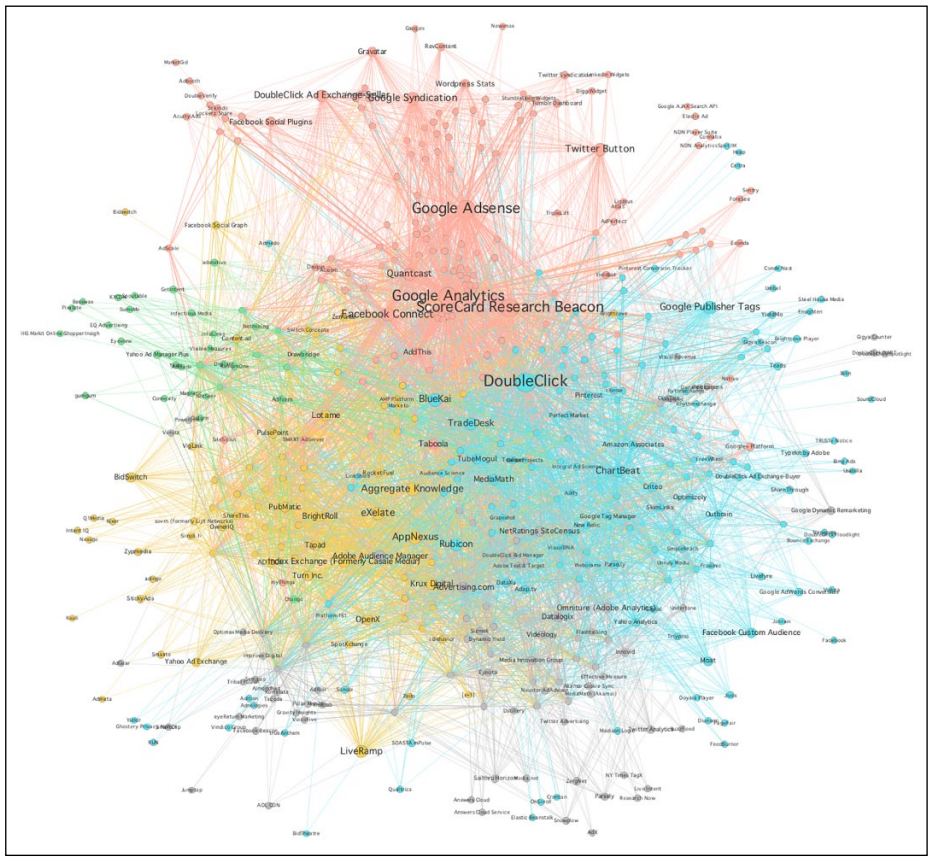

Figure 9. Mainstream news and junk content URLs and their audience marketplace configurations, as seen through third-party-tracking networks in which they are embedded. Regions are visually distinguished by colour.[4]

configurations involving specialised services and large numbers of intermediaries and data brokers specific to the larger media organisations in our corpus (blue). Mainstream news websites thus appear to be both more intrusive and more diverse in their tracking practices, suggesting the extent of dependence on advertising revenues. Third-party trackers ($n = 285$) received more connections (3763) from the 106 mainstream news page URLs than from the 113 junk news page URLs (2134) in our corpus. News sites also connect to a larger number of unique tracking elements (243) than junk news sites (144).

Also notable are the monopolistic tendencies resulting from the platformisation or extension of big US-based online platforms such as Google, Twitter and Facebook in the space of audience measurement and monetisation. While such tendencies have always been present in the audience measurement industry (Napoli, 2010), our analysis suggests that big online platforms have come to dominate online audience marketplaces (cf. Libert and Nielsen, 2018). The asymmetries between digital content producers and the digital

Table 1. Overview of scenographies responding to infrastructural uncanny of 'fake news'.

Manifestation of the uncanny	Infrastructures giving rise to the uncanny	Methodological tactic	Key findings
Junk political news URLs at top of search engine results	Links as currency of the informational web; the link economy; Google search engine as key actor in this economy	Repurposing search results to examine referential practices of top ranked websites for queries associated with particular junk news stories	Junk news sites absent from top search results, but present through referencing practices of top ranked sites
Junk political news stories more engaged with than mainstream political news stories on Facebook	Like, share and other engagement metrics as currencies of the social web; the like economy; Facebook as key actor in this economy	Repurposing aggregated metrics to examine character of engagement	Junk news plays different functions and fact-checked responses rarely shared in spaces where it thrives
Remote junk news producers monetising content about politics through established advertising industries	Online audience markets enabled by tracking infrastructures	Mapping tracking infrastructures of successful junk and mainstream news stories to examine online audience marketplace practices	Participation of non-local actors in producing political content is enabled by markets dominated by US tech/advertising companies

advertising industry are illustrated by the scale at which major content producers have become vehicles for intrusive digital advertising and data collection practices: over two-thirds of all tracking elements in this study are advertising related.

While the infrastructural uncanny arises from the ambiguities and unsettling effects of the unexpected participation of non-local 'distant' actors in the production of politically themed junk news content (suggesting trouble from afar, for example, Central and Eastern Europe), this scenography shifts focus back to 'domestic' US and Western European advertisers, marketers and technology companies that dominate online audience markets as well as associated tracking infrastructures which participate in the monetisation of junk and mainstream news alike.

Conclusion

This article suggests that the uncanny prompted by junk news can be taken as an empirical occasion to explore the infrastructures which enable these unsettling effects. Like Nathaniel's telescope in Hoffmann's *Sandman*, it is the work of infrastructures which precipitates the ambiguities and anxieties which can be understood as uncanny. Three scenographies explored in our *Field Guide to 'Fake News'* illustrate methodological tactics for exploring infrastructures as relational, collective accomplishments through

which content is ranked, engagement is metrified and attention is commodified by links, likes and trackers (Table 1). While methods associated with the link economy, like economy and tracking infrastructures focus on the formatting and stabilisation of social life in order to quantify, value and marketise content and products, our scenographies explore methodological tactics for scrutinising how online activity is rendered quantifiable, valuable and marketisable, thus redrawing and providing alternative perspectives on the enabling conditions and troubling effects of junk news.

The infrastructural uncanny does not just raise technical problems to be solved by engineers and algorithm experts (an outlook which commentators have critiqued as 'Band Aid solutionism', boyd, 2017a, 2017b) nor it is solely about psychological feelings or aesthetics of anxiety. Instead, it raises questions about what it means to be part of a society which is co-constituted by digital infrastructures. This uncanniness emphasises how infrastructures are not just extraneous constraints which may be shed; they are rather deeply embedded in the fabrics and routine functioning of many aspects of collective life (Peters, 2015). What characterises the uncanny is precisely the entanglement between that which has become familiar, habitual or banal, and the unsettling, which has the potential to transform the familiar.

In our scenographies, the infrastructural uncanny surfaces tensions involved in commercialisation of online content as part of what Dean (2009) calls 'communicative capitalism' as well as how 'the extension of the price mechanism to more and more domains of life, invariably with the help of information technology, clashes with other systems of valuation' (Rieder, 2017). The operations of ranking, metrification and commodification associated with the link economy, the like economy and online audience marketplaces prioritise ways of both organising the web and 'doing the social' in accordance with such commercialisation strategies. In the case of the US elections, the techno-commercial configuration of the web created conditions for political junk news content to thrive. While rankings, metrics and tracking aim to render online activity commensurable for specific forms of value extraction such that 'the social is collapsed with the traceable' (Gerlitz and Helmond, 2013), these renderings can also produce uncanny side effects.

Rather than trying to fix online platforms, methodological tactics such as those illustrated in our three scenographies may help to render these infrastructures *visible and actionable* in other ways – including for critique, intervention and alternatives. The infrastructural uncanny of junk news may be taken not just an opportunity for optimisation (as feedback in a system), but also as an occasion to discuss different positions and interests in society (cf. Marres, 2005; Mouffe, 2013). While the fake news scandal has prompted numerous remedial projects, policy consultations, startups, platform features and algorithmic innovations (cf. Bakir and McStay, 2018; Lazer et al., 2018), there is also a case for – to paraphrase Haraway (2016) – slowing down and dwelling with the infrastructural trouble. As public debates, controversies and imaginaries around digital technologies and digital culture continue to proliferate – from machine-learning to face-recognition to viral content – the infrastructural uncanny may be a useful concept for re-appraising how agential capacities are redistributed through digital infrastructures, for examining what is at stake and for informing interventions to re-align infrastructures with different societal interests, visions and values.

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Notes

1. Although some suggest not to use the term 'fake news' (e.g. Habgood-Coote, 2018; Wardle and Derakhshan, 2017), we use it in an emic sense to refer to the social disturbance precipitated by a variety of false, misleading or problematic online content. We think it is important to recognise the role of this term in relation to a range of issues, and to study *how* it has become contested (cf. Farkas and Schou, 2018; Harsin, 2018), rather than abandoning

because it has become contested. Thus, we mainly use the term to refer to how it has been used by others. To describe the phenomenon under investigation, we use the term 'junk news' (see Venturini, 2019), which focuses not just on the intrinsic qualities of online content (falsity, poor quality, deceptiveness, etc.) but also the viral circulation that it enjoys through the infrastructural conditions examined in this article.

2. In a similar vein, the term 'uncanny valley' in the field of robotics alludes to the unsettling effects of when automaton seems 'too human' (Mori, 2012).
3. We focused on public pages and groups, as access to private posts is restricted. At the time of the analysis, CrowdTangle returned the top 500 most popular public posts to verified pages as well as to pages with more than 125,000 fans according to their website.
4. This image is reproduced from Liliana Bounegru's doctoral dissertation, 'News Devices: How Digital Objects Participate in News and Research' (jointly awarded by the University of Groningen and Ghent University).

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