



Can Filter Bubbles Protect Information Freedom? Discussions of Algorithmic News Recommenders in Eastern Europe

Mykola Makhortykh & Mariëlle Wijermars

To cite this article: Mykola Makhortykh & Mariëlle Wijermars (2021): Can Filter Bubbles Protect Information Freedom? Discussions of Algorithmic News Recommenders in Eastern Europe, Digital Journalism, DOI: [10.1080/21670811.2021.1970601](https://doi.org/10.1080/21670811.2021.1970601)

To link to this article: <https://doi.org/10.1080/21670811.2021.1970601>



© 2021 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 15 Sep 2021.



Submit your article to this journal [↗](#)



Article views: 207





View related articles [↗](#)



View Crossmark data [↗](#)

Can Filter Bubbles Protect Information Freedom? Discussions of Algorithmic News Recommenders in Eastern Europe

Mykola Makhortykh^a  and Mariëlle Wijermars^b 

^aInstitute of Communication and Media Studies, University of Bern, Bern, Switzerland; ^bFaculty of Arts and Social Sciences, Maastricht University, Maastricht, Netherlands

ABSTRACT

The increasing use of recommender systems to provide personalized news delivery influences media systems worldwide. Using different data sources to predict what content will be interesting for specific readers, recommender systems can better accommodate individual information needs, but also raise concerns about potential audience fragmentation. However, current assessments of the effects of news personalization are predominantly based on observations from Western democracies. This Western-centric approach raises concerns about these assessments' applicability to other contexts, in particular non-democratic ones, and brings to question the influence of prevalent Western conceptualisations of news personalization (e.g., filter bubbles) on attitudes towards it in non-Western countries. To address this gap, we scrutinize discussions of the promises and threats of news personalization in countries characterized by limited press freedom: Belarus, Russia and Ukraine. Using document analysis, we examine how three categories of actors—academics, journalists and IT specialists—discuss news personalization and the ways it can affect the public sphere. Through our analysis we uncover how Western conceptualisations of news personalization interact with discussions about it in non-democratic media systems and scrutinize whether existing concerns about personalization are applicable to non-Western contexts.

KEYWORDS

Digital news; news personalization; algorithms; filter bubbles; post-Soviet

Introduction

News platforms worldwide adopt recommender systems to personalize their content delivery. The provision of individually tailored news suggestions, based on predictions made by recommender algorithms on the basis of data about users and their interactions with news content (e.g., which items users view and how much time they spend on news pages), is an important means of dealing with information overload and accommodating users' information needs (Karimi et al. 2018). However, it also raises concerns about how personalized news delivery may limit information diets and

CONTACT Mariëlle Wijermars  m.wijermars@maastrichtuniversity.nl

© 2021 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group
This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

enclose users in “filter bubbles” (Pariser 2011). So far, the debate about the promises and threats of news personalization has almost exclusively focussed on media systems in Western democracies,¹ whereas its potential effects and perceptions in non-democratic systems remain under-studied. To address this gap, we use document analysis to investigate how three categories of actors who are involved in personalization adoption in three post-Soviet countries discuss the notion of news personalization and its normative aspects within media systems with limited press freedom.

Our interest in how personalized news delivery is perceived in non-Western contexts is connected to the fact that its prevalent conceptualisations in the West underwent a series of shifts over the course of the past decade. Initially, personalization was hailed as a promising innovation allowing users to navigate the overwhelming amount of online content and keep them updated about important societal developments (Thurman and Schifferes 2012). Soon, however, the debate took a more negative turn and focussed on the possible harmful effects of algorithms on news distribution, in particular that they would limit users’ exposure to diverse viewpoints by creating isolated ideological communities (Pariser 2011) and amplify the fragmentation of the public sphere (Napoli 2018).

Reinforced by the frequent lack of transparency of algorithmic systems (Diakopoulos 2015), these concerns had a substantial impact on the perception of algorithmic innovations in the domain of journalism and media regulation (Bodó et al. 2019). While these worries have entered into common parlance, the empirical validity of the relationship between news personalization and audience fragmentation has been questioned by a number of studies (e.g., Zuiderveen Borgesius et al. 2016; Bruns 2019). Simultaneously, more nuanced assessments of the normative effects of personalization appeared, emphasizing its potential for stimulating truth finding (Eskens et al. 2017), facilitating readers’ self-development (Sullivan et al. 2019) and helping media to perform its societal functions in different models of democracy (Helberger 2019).

All throughout this cycle of deliberation—from flagging the potential negative impact of personalization on the public sphere, to raising public awareness and finally deconstructing the claims about the predominantly negative effects of personalization—the discussion has pertained mainly to the context of Western democracies. Such a context is characterized by a high degree of press freedom and limited governmental interventions in the media sphere. Yet, these conditions are not universal as is evident from the increasing adoption of personalized news distribution in countries with partially free or non-free media systems and strong paternalistic tendencies, such as Russia (Bastian et al. 2020) or China (Shia 2018).

The need to extend the debate about news personalization to these new terrains is underscored by the fact that, under conditions of tight state control, the societal effects of personalized news delivery may differ. In less free media systems, personalization can extend the state’s grip over citizens’ information diets via masked censorship (Makhortykh and Bastian 2020), but it may also facilitate the formation of more independent views *protected* by filter bubbles. The uncritical application of Western conceptualisations of personalization to non- or partially free media systems may obscure fundamentally different dynamics of adopting media innovations. Moreover, the currently limited debate on personalization in non-Western media systems means

that certain questions concerning its effects have not been asked; for example, whether algorithm-driven audience fragmentation may protect information freedom within (virtual) communities at (political) risk.

In this article we take the ambiguity concerning the possible effects of news personalization in non-Western contexts as our starting point and examine how its deployment is perceived in three post-Soviet countries characterized by limited press freedom: Belarus, Russia, and Ukraine. Using document analysis, we explore how personalization is discussed among three categories of actors involved in its development and adoption: academics, journalists and IT specialists. We focus on two aspects of this discussion: first, we examine how different actors define personalization as a form of media innovation in the context of news delivery. Second, we analyse to what extent Western conceptualisations of normative effects of personalization, in particular its relationship with the filter bubble phenomenon, influence discussions of algorithmically tailored news delivery in post-Soviet states.

The article is organized as follows: first, we review the development of news personalization in the West and contrast it with its development in the post-Soviet region. Then, we discuss how the adoption of personalization can be approached from the point of view of innovation diffusion theory, and conceptualize how the normative effects of prevalent conceptualisations of news personalization, in particular filter bubbles, might be different in non-democratic contexts. Subsequently, we introduce the methodology used to collect and analyse data for our study, and present our findings on how news personalization and filter bubbles are discussed by different categories of actors in post-Soviet states. Finally, we summarize our observations and elaborate on their implications for the adoption of news personalization in non-Western contexts.

News Personalisation in the West and the East

The origins of personalized news distribution in the West can be traced back to the growing need for information filtering in the beginning of the 1990s. The unprecedented volume of information about services and goods available through an expanding number of media channels led to a need for mechanisms to help consumers deal with the overabundance of choice. Responding to this need, the field of recommender systems (RSs) emerged, offering software tools and techniques to decide which items “are most likely of interest to a particular user” (Ricci et al. 2015, p. 1) by generating ratings for items that have not yet been seen by the user based on other items and users in the system (Adomavicius and Tuzhilin 2005).

The successful use of RSs by retail companies (e.g., Amazon) was followed by media platforms’ gradual transition towards personalized content delivery. In 2004, Google started tailoring its search results to users’ preferences (Hines 2004), and in 2006 Facebook deployed its EdgeRank algorithm to use data about relational interactions between users and objects to predict object ranking in news feeds (McGee 2013). While, initially, legacy media were slower to adopt personalization, the promise of higher user engagement and increased revenues led to the rapid expansion of personalized services in the 2010s, in particular of personalized mobile apps and RS-based

news content suggestions (Thurman and Schifferes 2012; Newman et al. 2016). However, the deployment of fully individualized news delivery systems remains a work in progress that is primarily pursued by the largest players on the international and regional news markets (Phillips 2018).

Similar to in the West, the adoption of news personalization in post-Soviet states can be traced back to the rise of RSs in the e-commerce domain. Following the success of Imhonet, an online platform for cross-domain content recommendation launched in 2007, other platforms (e.g., Afisha; Stravinskaia 2008) began deploying personalization to increase their revenues. The shift towards personalization was particularly intense in Russia. The country's larger media market and higher degree of competition contributed to a more eager adoption of innovations in order to gain an edge over competitors.

In the 2010s, the major drivers of personalization turned out to be social media platforms (e.g., Vkontakte and Odnoklassniki), search engines (e.g., Yandex) and news portals (e.g., Rambler). Yandex, a Russian corporation offering a conglomerate of services (e.g., search, email, news, maps) and successfully competing with Google among Russian-speaking audiences, occupies a special place among them. Yandex started personalizing its search engine in 2011 with the Reykjavik algorithm (Kanin 2018), followed by Atom, an online platform for personalized e-commerce utilizing the history of Yandex searches (Adams 2013). In 2015, Yandex released a personalized news stream (Yandex.Zen) that takes multiple factors into consideration (e.g., browsing history, location, and time of day; Gaskarov 2016; Murzina and Morozova 2019). In 2020, it launched a personalized social network, Yandex.Aura, that automatically matches users with similar interests (Verovir 2019).

Vkontakte, a popular social networking site, is another Russian platform that puts significant effort into personalization. Vkontakte started personalizing its news feed in 2016 to prevent users from "suffocating in the information stream" and allowing them "to learn the most important things in 2 min" (Amzin 2017). The personalization was based on user community subscriptions and indicators of interest, varying from likes or shares to dwell time. Two years later, Vkontakte deployed a new algorithm called Prometheus to promote "unique and interesting content" (Vkontakte 2018) by marking it with a "divine fire" symbol and improving its ranking in the lists of personalized recommendations.

Compared to these online platforms, post-Soviet legacy media are slow in their shift towards personalized distribution. While some Russian outlets such as *Izvestiia* and *Rossiiskaia Gazeta* started combining user-driven (e.g., subscriptions to specific topics or authors) with system-driven personalization (e.g., automatically targeting their audience with news content; Bastian et al. 2020), the adoption of personalization is yet to become a widespread phenomenon, especially on the regional level. A similar situation is found in Ukraine and Belarus, where some outlets (e.g., *Segodnia* and *Tut.by*) provide content recommendations based on popularity metrics and content categories.

News Personalisation and Media Innovation Diffusion

The adoption of news recommenders by media organizations in the West and the East is an instance of innovation diffusion that transforms online news consumption habits

(Moeller et al. 2020; Makhortykh et al. 2020). Defined by Rogers (2003) as the process of communicating innovation over time, the theory of innovation diffusion explains why some technological innovations are adopted faster than others (Ekdale et al. 2015). To do so, it uses a system of five attributes that determine the rate of innovation diffusion: relative advantage, compatibility, complexity, trialability, and observability (Rogers 2003).

The concept of innovation diffusion is commonly used to study innovations in the field of journalism, such as digital-first publishing (Ekdale et al. 2015), the use of social media (English 2016), or drone journalism (Uskali et al. 2020). However, there are only a few studies (Bodó et al. 2019; Sørensen 2013; Thurman and Schifferes 2012) devoted to the process of news personalization diffusion and all of them discuss it in the context of Western media systems. While some initial fallbacks of personalization adoption are noted, in particular regarding complexity on the user end (Sørensen 2013), existing research (Bodó et al. 2019; Thurman and Schifferes 2012) suggests that personalization is perceived quite positively by media practitioners, despite the fact that it profoundly affects their relationship with the audience which, in the case of other innovations, provoked rather tepid responses from journalists (Ekdale et al. 2015).

One feature that distinguishes the diffusion of personalization from other media innovations is the substantial influence of academic and IT communities on the process of its adoption. The academic debate on personalization, in particular the filter bubble concept, has had a substantial effect on the perception of the possible societal effects of news recommenders among journalists (Bodó et al. 2019). In the case of IT, the influence predominantly concerns technical rather than normative aspects: with the RS field being in a state of constant development, the IT community serves as an innovation agent bringing “bright, shiny things” (Posetti 2018) that can revolutionize content delivery for news organizations.

The degree to which the complex dynamics of personalization diffusion in the West is applicable to non-Western contexts is currently unknown. While a growing number of studies look at the adoption of media innovations outside Western democracies (e.g., Zhang and Feng 2019; Peko et al. 2019; Schmitz Weiss et al. 2020), none of them does so for news recommenders. However, there are reasons to expect that the adoption of personalization in post-Soviet states might be different from the West, because there are structural differences between the communities involved in the process in the two contexts.

Despite substantial differences between the media environments of post-Soviet countries, most of them are characterized by close ties between media and political systems which results in limited press freedom. The substantial influence of state authorities (Belarus and Russia) and, to a lesser degree, oligarchs (Ukraine) on media organizations can intervene with the adoption of technological innovations, in particular those that can endanger the state’s information sovereignty (Maréchal 2017) or undermine the control of political and business elites over the public sphere (Makhortykh and Bastian 2020). Considering that one of presumed effects of news personalization is the fragmentation of the public sphere, it can be assumed that post-Soviet practitioners may express more timid attitudes towards news recommenders. Another reason for less welcoming views on personalization can be the known

tendency to view technological innovation as a potential threat to the survival of legacy media (in particular on the regional level) that in the case of post-Soviet media often rely on rather outdated technical solutions (Vartanova 2015).

Similarly, academia and IT communities in the region are different from their Western counterparts. Such differences are less pronounced in the case of the IT community, which serves as an agent of innovation and is an important force of economic development in countries such as Ukraine or Russia (Eferin et al. 2019). Notwithstanding these differences (e.g., shorter planning horizons which are common in transition economies and may influence what kind of projects are perceived as (non-)feasible; Nissen et al. 2018), we assume that they should not have a substantial effect on the perception of news personalization compared with differences between Western and non-Western academics and media practitioners.

In contrast to the post-Soviet IT community that shares many common features with Western IT communities, post-Soviet academia is similar to post-Soviet journalism in terms of being rather different from its Western counterpart. In addition to being divided by an opposition between advocates of neoliberal and pro-Western research and education practices and those leaning towards practices determined by the region's Soviet past (Oleksiyenko 2020; Tlostanova 2015), post-Soviet academia is plagued by issues, such as extensive bureaucratization, precarious job security, linguistic and financial barriers that prevent extensive engagement with Western scholarship, and authorities' frequent attempts at meddling in academic discourse (in particular in the humanities and social sciences). These factors lead to a situation, in which regional academia has substantially less freedom in pursuing independent research and may lead to scholars being less eager to engage with contentious topics such as news personalization.

Informed by the differences outlined above, we ask our first research question:

RQ1: How do different categories of post-Soviet actors discuss personalisation as a form of media innovation?

Algorithmic News Personalisation in Non-Democratic Media Systems

A second under-studied aspect of news personalization is how its perception in non-Western contexts is influenced by prevalent Western conceptualisations of individualized news distribution, in particular filter bubbles. While existing studies (e.g., Haim et al. 2018; Puschmann 2019; Moeller et al. 2019) suggest that filter bubbles do not necessarily exist (at least in the form originally discussed by Pariser (2011)), the concept continues to be used in personalization-centred debates both within academia and among media practitioners (Bodó et al. 2019). Furthermore, as Bruns (2019) notes, the lack of empirical evidence supporting the existence of filter bubbles can be attributed to the frequent focus on personalization itself and not the changing political context within which it is used (e.g., the rise of hyperpartisan populism that amplifies audience fragmentation), thus stressing the importance of embedding the discussion of normative conceptualisations of news recommenders into specific socio-political contexts.

The debate on the implications of filter bubbles departs from the assumption of a Western democratic state, characterized by high degree of press freedom and media pluralism. Under these conditions, two primary concerns for Western democracies are ideological segregation and audience fragmentation. Multiple studies (e.g., Pariser 2011; Bozdag and Van Den Hoven 2015; Zuiderveen Borgesius et al. 2016) note that news personalization can result in citizens encountering fewer opposite opinions and gravitating towards more extreme viewpoints. The formation of these isolated information communities can also facilitate manipulations by enabling malicious actors to target specific population groups (Benkler et al. 2018). It can also complicate public deliberation of pressing societal matters (Gorton 2016), in particular when users are unaware that delivered content is individualized, and limit possibilities for citizens to form common experiences in relation to the present and the past states of the public sphere.

Compared to the extensive debate on the effects of filter bubbles on Western public spheres, there is little discussion on personalization's role in non-democratic contexts. A few existing studies focus on specific instances of manipulating algorithmic affordances by neoauthoritarian regimes to undermine the functioning of Western democracies (Benkler et al. 2018; Bolsover and Howard 2018). The impact of news personalization on domestic media systems in non-democratic countries, however, remains under-conceptualised. This can be attributed to the assumption that in this context personalization will primarily solidify state control over the public sphere (Jiang and Okamoto 2014; Tucker et al. 2017) by censoring unwanted opinions and promoting pro-regime content.

While such a depressing scenario is, indeed, possible, it presumes that authorities in semi- and non-free states are aware of the manipulative potential of personalization, understand how personalization works and have direct access to the mechanisms behind it. The combination of these three factors is less likely in the post-Soviet countries than, for instance, in China with its advanced mechanisms of internet censorship (Roberts 2018). The largely unhindered presence of Western online platforms in post-Soviet states suggests that the state control over personalization is far from complete, because there are multiple channels of personalized distribution which are not directly controlled by the authorities.

Under these conditions, the formation of filter bubbles can potentially benefit rather than harm the public sphere, in particular as manipulation and ideological segregation are already part of non-free media systems. Furthermore, such systems are also often characterized by high polarization related to the process of democratic erosion (McCoy et al. 2018), thus removing another Western-centric concern about the effects of news personalization. By forming isolated ideological communities, news personalization can actually counter the authorities' disproportionate impact on the public sphere by limiting the efficiency of state propaganda and shielding more independent views. Such a democratizing effect can be amplified by the higher degree of trust towards algorithmic content distribution under the condition of limited press freedom (Thurman et al. 2019), which can be traced back to the common perception of the algorithm as a more objective force compared to humans (Gillespie 2014).

We therefore argue that even if the existence of phenomena such as filter bubbles has not yet been empirically proved or disproved in semi- or not free media systems,

the dynamics and socio-political effects of news personalization in such contexts might be interpreted differently from in the West. If the debate on the desirability and impact of news recommenders in non-Western contexts is conducted exclusively by means of concepts borrowed from the Western academic debate, such as filter bubbles, the particulars of the actual impact may not be appreciated or incorrectly interpreted. Hence, the second research question we pose is as follows:

RQ2: How is the discussion of the normative aspects of personalisation in post-Soviet states influenced by the filter bubble conceptualisation?

Methodology

Data Collection

To answer our research questions, we examined how news personalization is discussed among three categories of actors: academics, journalists and IT specialists. Our selection is based on these actors' active involvement in the adoption (journalists), development (IT specialists), and critical evaluation (academics) of news personalization. While other categories of actors (e.g., policy makers) have also recently become involved in the debate on the effects of personalization in the region (Maréchal 2017; Wijermars 2021), the degree of such involvement remains relatively low compared to the three categories listed above.

To implement the study, we relied on the analysis of documents such as academic articles, opinion pieces and technical "how to" guides. We treated these documents as a means of articulating particular definitions and interpretations of the technological innovation both within the community of practice to which the actors belong and for the broader general public. While such an approach lacks insights that can be gained through conducting interviews, it has demonstrated its applicability to studying the adoption of technological innovations in multiple domains, ranging from nuclear power (Jasanoff and Kim 2009) to smart energy infrastructure (Ballo 2015).

In the process of data collection, we had to address two major challenges. First, we identified a lack of unified vocabulary for discussing news personalization in the post-Soviet states. Some terms that are common in Western scholarship have a different meaning in the regional context such as "news personalisation" which is used both in relation to news recommenders and the personification of political actors in news media. Other terms, such as "filter bubbles," are often translated in different ways (e.g., in Russian there are several terms to denote the concept, including "пузырь фильтров," "фильтр интересов," "информационный пузырь").

After testing multiple queries, we decided on using six search queries. Three of them were related to the most common translations of the "filter bubble" term in the regional languages, namely "пузырь фильтров" (Russian), "бульбашка фільтрів" (Ukrainian) and "бурбалка фільтраў" (Belarusian). The other three queries were constituted by the term "news personalisation" translated in each of the three languages, namely "персонализация новостей" (Russian), "персоналізація новин" (Ukrainian) and "персаналізацыя навін" (Belarusian). Because these queries were conducted in the regional languages, we did not retrieve documents produced by members of the

respective post-Soviet communities who publish in other languages (e.g., English). This limitation is of particular relevance for the academic community, where a number of regional scholars² do contribute to the international debate on news personalization and filter bubbles in English.

The second challenge concerned the selection of platforms for data collection. Because of the lack of a single platform where documents produced by all categories of actors could be located, we combined data from different platforms. For academic actors we used Google Scholar, where publications produced by scholars from all three countries are indexed. Even while Google does not provide exact information on the size of Google Scholar and user statistics, existing research suggests that the platform is “the most comprehensive academia search engine” (Gusenbauer 2019: 199) and, thus, is the closest option available for acquiring a comprehensive overview of the state of academic research on the subject of news personalization in the region.

For IT specialists, we relied on data from Habrahabr, a collaborative IT platform used by Russian-speaking developers from the post-Soviet states. As of July 2021, Habrahabr has 1.3 million users registered (Habrahabr 2021) and is viewed as the largest information resource for IT specialists from Russia (Minak 2020) as well as Russian speakers from other post-Soviet countries. It hosts both individual and corporate blogs of the largest post-Soviet IT companies (e.g., Yandex) and is valued both for its important role for soliciting feedback from the IT community and the possibility of generating traffic for company websites (ni404 2014). While HabraHabr offers a less comprehensive overview of IT discussions compared with the one provided by Google Scholar for academic ones, it is still the largest information resource for Russophone IT specialists in the region.

Finally, in the case of journalists we used a selection of outlets from each of the three countries that combined non-specialised media targeting the general public and professional outlets focussing on media practitioners. These included Lenta and Zhurnalist for Russia, Nasha Niva and the websites of the Belarus Association of Journalists (BAJ) and Mediakritika for Belarus, and Segodnia and Media Sapiens for Ukraine. In the case of popular media (i.e., Lenta, Nasha Niva, and Segodnia), we based our choice on the popularity of the outlet within the country and did not take into consideration other factors (e.g., some outlets, such as Lenta, are more sympathetic towards the authorities, whereas others, such as Nasha Niva, are more oppositional). Because of the lack of a large platform where content produced by different outlets would be aggregated (as in the case of Google Scholar and, to a certain degree, Habrahabr with the latter hosting blogs of multiple IT companies active in the post-Soviet countries), the collection of data about journalistic discussions turned out to be less systematic and was based on a small set of outlets. It resulted in a significant reduction of journalistic materials that potentially could be retrieved (it is also reflected in the summary of corpus materials provided in Table 1) that shall be taken into consideration when interpreting the findings provided later in the article and the conclusions made on the basis of them.

While running the queries in March 2020, we filtered the results to include only documents published on the platforms in the period 2015–2020 (in the case of Google Scholar, the documents outside the range were filtered out automatically,

Table 1. Search queries results and their relevance for personalization (in general and in the context of news).

Platform	пузырь фильтров			бульбашка фільтрів			бурбалка фільтраў			персонализация новостей			персоналізація новин			персаналізацыя навін		
Google Scholar ^a	4000	38	32	752	12	12	2	2	2	3340	36	23	690	34	24	8	2	2
HabraHabr	70	15	12	0	0	0	0	0	0	129	91	23	0	0	0	0	0	0
Zhurnalst	11	11	11	0	0	0	0	0	0	25	21	19	0	0	0	0	0	0
Media Sapiens	2	2	2	4	4	4	0	0	0	2	2	2	4	2	2	0	0	0
Segodnia	27	0	0	0	0	0	0	0	0	19	5	1	17	6	1	0	0	0
BAJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mediakritika	2	2	2	0	0	0	0	0	0	3	3	3	0	0	0	0	0	0
Lenta	14	0	0	0	0	0	0	0	0	35	6	0	0	0	0	0	0	0
Nasha Niva	28	1	1	0	0	0	0	0	0	20	5	2	0	0	0	0	0	0

^aThe massive discrepancy between the first and the second number for Google Scholar is explained by our decision to investigate only the first 100 results for each query for this specific platform for feasibility reasons. Follow-up studies can benefit from looking at a broader selection of Google Scholar results, albeit our findings suggest that they would need to deal with a high proportion of “noise” (i.e. irrelevant results).

whereas in the case of other platforms they were filtered out manually). For the majority of platforms, all retrieved documents were used with the exception of Google Scholar for which a particularly large number of documents were retrieved (see Table 1). To keep the analysis feasible, we added an additional limitation to the data collection for Google Scholar and examined the first 100 results suggested by the platform to be most relevant for the respective queries.

The need to rely on different platforms also implies potential differences in the samples of documents retrieved from them using the above-mentioned queries. In all cases, we aimed to use the internal search mechanisms to search for the queries, namely Google Scholar search (with outputs sorted by relevance and without additional filters except specifying that the search is to be conducted for publications appearing between 2015 and 2020), HabraHabr internal search (with outputs sorted by relevance and with the search conducted across posts), Lenta internal search (outputs sorted by relevance), Media Sapiens internal search (outputs sorted by relevance), Nasha Niva internal search (default search options) and BAJ internal search (default search options). In the case of Zhurnalst and Segodnia, we had to rely on the Google search engine to retrieve content with the respective keywords from these platforms (i.e., using the query with a custom search filter such as “site:jrnlst.ru персонализация новостей”) either because of the lack of internal search (Segodnia) or its malfunctioning (Zhurnalst). To account for the possible fluctuation of Google search results retrieved for a specific website, we repeated the procedure for Zhurnalst and Segodnia twice and then merged the results for each website and removed duplicate outputs.

Altogether, the differences in data collection strategies between the platforms, such as the reliance of a single aggregating platform for academics and IT specialists and several individual platforms for journalists, lead to substantial limitations of the collected samples and effectively make their quantitative comparison not possible. These limitations are further amplified by the necessity to rely on algorithmic mechanisms of information retrieval systems for acquiring data (e.g., Google Scholar or HabraHabr search) and a small number of search queries that might result in unequal visibility of specific viewpoints on news personalization and distorting our analysis of how

different communities (in particular, journalists) engage in the discussion about news recommenders in post-Soviet states. It is also important to note that in the case of Google Scholar, we had to artificially restrict the number of retrieved outputs which were included in the analysis that further limits our ability to draw conclusions about how personalization and its normative aspects are discussed within the academic community. While the current approach is sufficient for examining some features of the personalization discussion across the countries and communities involved, a more systematic approach for data collection is required for drawing reliable comparisons between the ways news recommenders are discussed and perceived in different post-Soviet states.

Data Analysis

We analysed the resulting corpus to identify the documents dealing with news recommenders and their societal effects, in particular the possibility they would create filter bubbles. To do so, we manually examined each document to see if it discussed either of these subjects and whether it does so in the context of news. The examination was conducted by one of the authors with the required language skills. The summary of the initial corpus screening is provided in [Table 1](#), where the first number refers to the overall number of documents returned by the search query for the specific platform, the second indicates the number of documents that were actually related to recommender systems/filter bubbles, and the last indicates the number of documents which explicitly discussed these subjects in the context of news.³ The latter category of documents was selected for further analysis in our study.

The results of the document screening show that many retrieved documents were not related to personalization or filter bubbles in the context of media innovation. Furthermore, there is a substantial imbalance in the number of documents coming from different communities and countries. As already noted above, this imbalance can be attributed to multiple factors, varying from an imperfect functionality of retrieval algorithms (e.g., built-in search mechanisms of Habrahabr or Google Scholar), skewed platform audiences (e.g., prevalence of Russian developers on Habrahabr), or the more dispersed nature of journalistic platforms. Despite it being a potential limitation for the cross-country and cross-community comparability of our observations, we suggest that it can be viewed as an interesting finding by itself that can inform future inquiries in document-based analyses of technological innovation (in particular, personalization) in the region.

Following the initial screening, we examined the documents related to media innovation in more detail. Specifically, we were interested in two aspects related to our research questions: (a) the general definition of personalization as a media innovation; and (b) the discussion of the role of filter bubbles in the context of personalization adoption by the regional media systems. To investigate these aspects, we created short summaries for each document indicating how it describes the use of news recommenders (aspect a) and what the role of filter bubbles is in this process (aspect b) and supplemented them with quotes. These summaries were coded using two coding schemes. For aspect a (i.e., discussion of news personalization), we organized our

coding around the set of five attributes determining the adoption of innovation (Rogers 2003): (a) relative advantage (whether an innovation is discussed as being better than existing practices); (b) compatibility (whether an innovation is discussed as consistent with existing values and needs of adopters); (c) complexity (whether an innovation is discussed as difficult to use); (d) trialability (whether an innovation can be tested or experimented with); and (e) observability (whether the effects of an innovation are visible). For aspect b (i.e., the role of filter bubbles), we used inductive coding organized along the lines of positive and negative perceptions of filter bubbles.

Discussions of News Personalisation and Filter Bubbles in the Post-Soviet Triangle

Discussing News Personalisation as a Media Innovation

Our analysis showed that all three communities generally discuss news personalization in a positive light. While this finding aligns with earlier studies on personalization adoption in the West, in particular among the journalistic community (Bodó et al. 2019), the prevalence of positive attitudes in the corpus of documents we analysed is surprising considering the substantial differences between journalism in Western democracies and post-Soviet states, and contrasts with the rather critical stance of the Western academic community. This finding can be attributed to the journalistic and academic communities focussing on the short-term benefits of personalization adoption (e.g., revenue increase) and not devoting much attention to its potential societal effects, in particular as personalization remains at the early stage of its adoption. Such a focus on immediate (and rather context-agnostic) advantages of adopting technological innovation can explain the absence of differences in how personalization is perceived by Western and post-Soviet journalistic communities and the positive attitudes expressed in post-Soviet academia.

This interpretation is supported by our analysis of the innovation attributes that contribute to the positive reception of personalization, in which compatibility and relative advantage play a primary role. The former attribute is referred to by the academic and IT communities, emphasizing the benefits of personalized news distribution for news readers. In the case of Ukrainian and Russian academia, the emphasis is placed on personalization enabling more choice for users in terms of what to read and how to read. By allowing users to find news “that is interesting for them at the current moment” (NosaeV and VidiashEva 2019, p. 159), personalization is argued to help news media adapt to individual reading habits to maximize users’ comfort (Ryzhov and Novikov 2017) and allow them to receive content fitting their individual characteristics, such as commitment to freedom and openness (Titov 2017). A similar attitude is expressed in a single document coming from Belarusian academia, where personalization is referred to as part of an important trend to “satisfy individual information requests of the user” (Hradziushka 2015).

A similar emphasis on the compatibility of personalization is traced in documents associated with Russian IT. These documents stress that personalization is important for satisfying users’ needs, because it helps them to locate relevant information and

enables more control (and comfort) over what they consume (qshnar 2015a). In some cases, the discussion of personalization by IT specialists takes an advertisement-like form with claims that personalized applications “love” their users more than non-personalized ones and offer users the exact kind of news “they need” (qshnar 2015b). Similar to academics, IT specialists refer to personalization as a means to deliver a new way of consuming news that can account for different physical and material needs (alconost 2018) and enable a customized experience for each individual (FutureCollector 2019).

This narrative is particularly actively promoted by actors associated with Yandex, the Russian tech giant, who stress the importance of treating customers as individuals and not as “an abstract 1 in the row of other 1 s” (Zabannyh 2013). Yandex associates refer to personalization as a key means of approaching users individually and providing them with more relevant information. In the case of Yandex.Zen, for instance, it is claimed to allow Yandex to make users spend more time on the platform and “not feel disappointed about the time spent” (Kliuev 2019b). Similarly, in the case of Yandex.Radio, the success of personalization is assumingly reflected in the increase of time users spent listening to the “beautiful flow of music that would never end” (Kliuev 2019a). The need to diversify such flows by including less popular and more niche content is also noted, but no normative reasoning is provided.

In the case of journalism, the emphasis on compatibility is less pronounced. Some documents coming from Ukraine and Russia discuss the advantages of personalization for the audience. Usually, the focus lays on personalization improving user experience by saving readers the time and effort required to find relevant and interesting materials (Lefter 2015).

In relation to the second innovation attribute—relative advantage—we observe the reverse situation as it is actively discussed among journalists, in particular from Russia. Similar to the Western discourse (Newman et al. 2016) the adoption of personalization is referred to as the future of the media industry in Russia (Kornev 2017; Nigmatullina 2018; Romanova 2018) and Ukraine (Golubev 2018). Personalization is argued to be essential for keeping media outlets in business by captivating the audience (Nigmatullina 2018) and monetizing content (Golubev 2018). The latter argument is expanded by the claim that personalization transforms the traditional market model by allowing media to sell not only information, but also an individualized experience that will serve as a “new currency” of the media industry (Kornev 2017).

Journalists also claim that personalization can not only offer market advantages, but also help media to fulfil their societal functions, namely informing the audience about important developments. In this context, news recommenders are presented as part of the process of selecting and delivering verified and helpful information to readers as quality media are expected to do (Allahverdov 2018; Novikov 2018). Individualized news delivery is also treated as a possible way out of information bubbles, because of its potential for identifying and closing individual knowledge gaps (Nigmatullina 2018). The impact of personalization on the political role of legacy media, however, is largely omitted; only one document notes that it is essential for preserving the functionality of legacy media in democratic societies following the ongoing changes in information distribution (MediaMedia 2020).

While the relative advantage argument is also present in the case of the academic and IT communities, the focus there lays more on new possibilities for monetization. In the case of Russian academia in particular, personalization is referred to as an effective tool for targeting audiences that are particularly susceptible to new means of content distribution (e.g., youngsters; Sumskaia 2018) and for cementing audience loyalty by offering each user individualized treatment (Solov'ev 2018). The same arguments are found in IT documents which argue that personalization is essential for the future of the news industry by enabling successful monetization of content (darikova 2015) as well as by increasing user engagement (darikova 2016) and the outlet's reach (kozyrevskaya 2016). A similar, albeit less pronounced discussion of personalization benefits for news publishers is found in Ukrainian scholarship, where some studies (e.g., Vorzheva 2016) note its potential to improve audience targeting.

Besides positive attitudes towards personalization, we identified some documents expressing more negative views, which primarily come from Ukrainian and Belarusian journalists and Ukrainian and Russian scholars. A possible explanation for the more critical stance in the case of these two journalistic communities can be the fact that technological innovations, such as personalization, are associated with Russian competitors and thus treated as a potential threat to the regional market.

The incompatibility of personalization with the needs of the audience is the usual source of criticism in the case of documents coming from journalists. For Ukraine, such incompatibility is associated with the possibility of abusing personalization as a means of information warfare in order to amplify the distribution of false or manipulative content via microtargeting (Potcheptsov 2018). By contrast, for Belarus the focus lays on the loss of control over information selection as it is transferred from the user to the recommender and leads to decreased agency of individual readers (Lavnikevich 2015). A single exception focussing not on incompatibility, but on the relative disadvantage of personalization comes from Russia, where personalization is criticized for destroying the role of legacy media as narrators of a "common history" (Miroshnichenko 2017) by providing each user with its own version of current events.

We observed a similar emphasis on the incompatibility of personalization with individual readers' needs in documents produced by Ukrainian (Akimova 2017; Grigorova 2017; Ishuk 2015) and Russian (Sukhodolov et al. 2019; Sushpanov 2016) scholars. Here, personalization is criticized for facilitating "intellectual isolation" and turning information into a "legal drug" (Sukhodolov et al. 2019) by keeping users within a self-comforting information bubble and potentially leading to their radicalization (Sukhodolov et al. 2019; Sushpanov 2016). It is also argued that personalization deprives users from making their own choices (Grigorova 2017; Ishuk 2015) while providing a misleading feeling of being in-control (Akimova 2017). With some exceptions, however, the above-mentioned studies do not take into consideration broader societal effects of personalization and concentrate on the level of individual users.

Some critical assessments coming from the IT community also focus on personalization's incompatibility with individual user interests, but from a more technical perspective. Personalization is referred to as a major threat to user privacy, because it stimulates companies to collect more personal data to provide individualized offers (Data_center_MIRAN 2020). A similar argument is echoed in a document relating

personalization to ordinary users' loss of control over their data and consumption choices (m1rko 2019). Another point of criticism relates to how personalization captures the initial set of user choices and does not accommodate changing interests, thus resulting in boredom and limiting possibilities for users' self-development (DevsStorm 2019).

Interestingly, we did not find documents discussing the remaining three innovation attributes (i.e., complexity, trialability, and observability) in the context of personalization perceptions. The absence of these specific attributes can be again ascribed to the early stages of personalization adoption, in which its practical implementation—for which these attributes are particularly relevant—remains an open question (in particular, regarding the academic and journalistic communities).

Perceptions of Filter Bubbles and Their Normative Effects

Unlike the predominantly positive perceptions of news personalization, filter bubbles are treated mostly negatively within all three communities. However, despite the fact that the prevalent sentiment towards filter bubbles was found to be the same as in the West, we observed substantial differences in terms of how this prevalent conceptualization of news personalization is discussed.

The first of these differences concerns the relatively weak relationship between filter bubbles and news personalization. In particular in the documents coming from the journalist and IT communities, filter bubbles are primarily discussed in the context of social media platforms and not legacy media, thus resulting in a quite limited connection between the concept and the adoption of news recommenders by journalistic organizations. In the case of IT, this gap is exemplified in filter bubbles being primarily mentioned in Western documents translated into Russian and then shared by the community (e.g., m1rko 2019). As a result, in the documents examined, filter bubbles tend to be treated as quite an abstract phenomenon that does not have much to do with actual post-Soviet practices; this also results in limited consideration of filter bubbles' effects on the public sphere in the region.

The second major distinction is the limited discussion of societal and political implications of filter bubbles. In contrast to in the West, where audience fragmentation and potential radicalization arguments are viewed as major concerns, only a handful of examined documents discuss them in the context of post-Soviet filter bubbles. Primarily originating from Russian academia, these documents reiterate common Western arguments about how personalization facilitates the formation of information communities, where participants are isolated from alternative opinions and can become radicalized (Potseluev and Podshibiakina 2018; Sushpanov 2016). The threat of radicalization is also noted by IT specialists (FooBar167 2020; ponchiknews 2019), but there it is limited to occasional mentions of personalization exposing users to more radical content. No explicit discussion of the exact consequences of such exposure is provided except for the claim that it can be "bad for the brain" and cause radicalization (FooBar167 2020).

Similarly, we observed a near absence of discussion of the possible negative effects of filter bubbles on legacy media. Some documents from the Russian journalistic

community note that a moral panic caused by filter bubbles can increase the audience's anxiety, which can negatively affect the work of newsrooms (Shestopalov 2018) and make journalists spend more time checking their sources (Vakhemans 2018). However, neither of the documents goes into detail discussing the exact causes of readers' anxieties or the possibility of news personalization amplifying filter bubbles. To the contrary, some documents claim that news recommenders enable the bursting of information bubbles by showing "that there is something else out there" (Amzin 2017) and closing the audience's knowledge gaps (Miroshnichenko 2018).

The only societal concern that features prominently in regional discussions of filter bubbles that we examined is the threat of disinformation. Similar to some Western studies (Benkler et al. 2018; Bolsover and Howard 2018), post-Soviet academia (Gurov 2019; Maliukova 2018; Riabchenko and Malysheva 2019) and journalism (Ustinova 2016; Dudina 2017), especially in Russia, emphasize the possibility of filter bubbles facilitating manipulation. Filter bubbles are blamed for isolating users from information sources and, by doing so, serving as "the most common means of deploying fake news" (Maliukova 2018). Interestingly, particular emphasis is placed on political disinformation (Gurov 2019; Riabchenko and Malysheva 2019) which also can be interpreted as a concern that filter bubbles undermine state control over the public sphere. Similar concerns are expressed by Ukrainian journalists, where filter bubbles are referred to as a means of information warfare employed by Russia to spread disinformation (Potcheptsov 2017).

Instead of focussing on the societal effects of filter bubbles, the discussion among the post-Soviet communities, in particular academia, tends to focus on their implications for individuals' news consumption. The major concern in the case of Ukrainian (Matchuk 2018; Meleshko et al. 2018) and Russian (Funtova 2017; Shestakova 2018; Shkorubskaya 2018) academic communities is information isolation caused by filter bubbles, namely bubbles separating users from information they do not want to receive in order to put them into a more "comfortable" (Funtova 2017) information environment. As a result, filter bubbles are claimed to limit users' access to information (Funtova 2017; Matchuk 2018) as well as possibilities for discovering new things (Meleshko et al. 2018), diminish individual capabilities for critical thinking (Shkorubskaya 2018), or put users into echo chambers, where the same interpretations of societal processes are iterated and alternative views are silenced (Shestakova 2018).

Whereas Belarusian communities also focus on the negative effects of filter bubbles on individual users, the main emphasis here is put on user control. In the case of academia, filter bubbles are treated as part of the process of users turning into so-called "glass humans" (Kryvalap 2018b)—i.e., individuals who cannot hide anything because they do not control their data anymore. Because of the loss of control over data on their news consumption, users become isolated within their own information bubbles enabled by algorithmic systems (Kryvalap 2018a). Similar concerns are expressed by Belarusian journalists (Khrapovitskii 2017; Zhdanov 2018) who criticized filter bubbles for diminishing readers' agency and threatening their "information hygiene" by enclosing them in bubbles filled with "funny racoon videos and popular videos of unsmart bloggers" (Zhdanov 2018).

Despite negative perceptions of filter bubbles being prevalent in the post-Soviet discussions of personalization that we looked at, we also found some more nuanced

assessments of their normative effects. Primarily coming from Russian academia and IT communities, these assessments emphasize filter bubbles' potential for enhancing opinion diversity by allowing like-minded citizens to come together and reinforce their beliefs (Podshibiakina 2019) or protecting users from fake and extremist content by enclosing them in bubbles of reliable and verified information (VAS Experts 2017). However, no political implications of such benign uses of filter bubbles are discussed, with the exception of one document⁴ from the Russian IT community that notes that filter bubbles can be an important element of information freedom by providing users more choice (Kozliuk 2020).

Conclusion

Our analysis of discussions of news personalization in three post-Soviet states highlights substantial divergence in its adoption between Russia, Ukraine, and Belarus. In all three countries the use of personalization by legacy media remains in its early stages, but the shift towards personalized news delivery seems to advance faster in Russia which has a large and highly competitive media market. It is reflected in the fact that the debate on personalization is the most intense in Russia, where the discussion of technological innovations is increasingly intertwined with the state's attempts to consolidate its hold over the local media sphere (Wijermars 2021).⁵

While we observed relatively few references towards politics in the discussion of news personalization within our corpus, the very fact of their absence (contrary to the Western debate's focus on the political and societal effects of personalization) can be interpreted as a consequence of the different political and media environment in the post-Soviet region. Regarding both news personalization and filter bubbles, we observed the tendency of all three communities (i.e., scholars, journalists, and IT specialists) to focus not on the societal and political effects of technological innovation, but on its advantages and disadvantages for individual users. Such an omission of the long-term effects of personalization can be attributed to it only starting to take root in the region, which is also supported by the observed focus on more conceptual aspects of innovation diffusion in its discussion, namely relative advantage and compatibility. However, we suggest that, under conditions of limited press freedom, it can also be an indicator of the tendency to downplay the possible societal effects of innovation that can be viewed as a threat to the state's control over the public sphere and its information sovereignty.

It is hard to state with confidence whether the predominantly positive attitudes towards news personalization that we observed in the examined documents should be attributed to differences between regional communities of practice and their Western counterparts or the early stage of personalization adoption, where the advantages of innovation are already obvious, but the complexities of its implementation and potential side effects remain obscure. However, the very fact of profound differences between Western debates on personalization as a form of media innovation and the ones we observe in post-Soviet states (in particular within the academic community) stresses the need for a more profound assessment of the processes of innovation diffusion in non-Western contexts by highlighting the substantial variation between adoption of specific innovations in Western democracies and elsewhere.

Our findings also highlight the different interpretation of news personalization's prevalent conceptualization—that is, filter bubbles—in the post-Soviet context. In contrast to the Western academic and public debates, we found little explicit discussion of their societal effects, with the single exception of disinformation, which can be interpreted as an indirect recognition of filter bubbles' potential to undermine state control over the public sphere. At the same time, despite predominantly negative claims about filter bubbles and their detrimental impact on individuals' news consumption, we observed some cases (primarily associated with Russian IT) in which the concept was related to the notion of information freedom, thus confirming the suggestion about the possibility of using algorithmically isolated online communities for fostering more pluralistic thinking under conditions of limited press freedom. This observation further prompts the need to contextualize the debate on news personalization and critically question both positive and negative assessments of its projected effect on society.

Taken together, our findings show the pressing need for more empirical research into the effects of news recommenders in semi- and non-free media systems that is also noted in earlier research on personalization in non-Western contexts (Makhortykh and Bastian 2020). Our analysis highlights that in non-democratic media systems the role of personalization can be discussed and potentially perceived rather differently, and that there is sufficient reason to assume it may set in motion different dynamics of innovation adoption compared to those in the West. Many concerns about the impact of news personalization on the public sphere are nullified when media are not, or not perceived as, independent, and some of these concerns might actually be treated as opportunities for making the media environment *more* pluralistic. Such connections between, on the one hand, the impact of personalization and, on the other hand, the characteristics of media systems and the normative standards for news production require further theorization.

Some limitations to the current study need to be mentioned. While our corpus aimed to gather a diverse range of professional and academic perspectives, it is inevitable that multiple aspects of personalization were omitted and many questions remained unanswered. Specifically, our findings are confined to documents using the terms “news personalisation” and “filter bubble,” whereas the discussion of personalization in post-Soviet states also deals with other subjects, varying from more academic ones (e.g., echo chambers and selective exposure) to more industrial ones (e.g., specific types of recommender systems and concrete distribution mechanisms). Besides varying vocabulary, the lack of a single platform for data collection resulted in corpus imbalance that favoured academic and (Russian) IT communities for which we located platforms aggregating a large volume of relevant documents, whereas the more dispersed nature of journalistic platforms resulted in less data retrieved. Furthermore, the use of a single coder analysing documents in all three languages leaves some space for individual bias which might result in occasional misinterpretation on the level of individual documents (in particular, when attributing them to specific aspects of innovation diffusion).

Future research may complement document analysis with interviews with local media practitioners to gain deeper insight into their experiences with news

personalization as well as to identify those views that are relevant to news personalization but employ a different terminology (e.g., discussing echo chambers or using more industrial terminology such as “personal settings”). Second, research on audience perception of news personalization would allow us to test the hypothesis that, under conditions of limited media freedom and lack of media diversity, algorithmic recommendation systems are evaluated differently. Finally, empirical research is needed that establishes the effects of algorithmic recommenders in semi- and non-free media systems, such as the countries examined in this article.

Notes

1. For some examples, see Bastian et al. (2019; 2020), Bodó et al. (2019), Diakopoulos (2015; 2019), Eskens et al. (2017), Harambam et al. (2019), Helberger (2016, 2019), Thurman et al. (2019), and Thurman and Schifferes (2012).
2. For some examples, see Bodrunova and Litvinenko (2016), Bodrunova et al. (2017), Kukulin (2020), and Martyanov et al. (2019).
3. In those few cases where a document was returned by both the “filter bubble” and the “news personalisation” queries, the document was counted twice.
4. A similar argument was formulated in articles published by Russian authors who also publish in Western journals, such as the study by Bodrunova and Litvinenko (2016), which argues that online polarisation can cultivate and consolidate an anti-establishment consensus by creating a “safe space” where alternative interpretations can thrive.
5. An illustrative example related to use of news recommenders, albeit not by legacy media, is the 2016 Russian law on news aggregators that makes them responsible for verifying content and stimulates them to re-distribute only content produced by media outlets licensed by the government (Wijermars 2021).

Acknowledgements

We would like to thank the anonymous reviewers and the Digital Journalism editorial team for their valuable feedback that helped us improve the manuscript.

Disclosure Statement

No potential conflict of interest was reported by the authors.

ORCID

Mykola Makhortykh  <http://orcid.org/0000-0001-7143-5317>

Mariëlle Wijermars  <http://orcid.org/0000-0001-7735-4403>

References

- Adams, B. 2013. Yandex introduces Atom concept for personalised content. <https://www.stateof-digital.com/yandex-introduces-atom-personalised-content/>.
- Adomavicius, G., and A. Tuzhilin. 2005. “Toward the Next Generation of Recommender Systems: A Survey of the State-of-the-Art and Possible Extensions.” *IEEE Transactions on Knowledge and Data Engineering* 17 (6): 734–749.
- Amzin, A. 2017. 8000 slov o rekomendatsiiakh Vkontakte. <https://jrnlst.ru/8000-words-about-vk>.

- Bastian, Mariella, Mykola Makhortykh, and Tom Dobber. 2019. "News Personalization for Peace: How Algorithmic Recommendations Can Impact Conflict Coverage." *International Journal of Conflict Management* 30 (3): 309–328.
- Bastian, Mariella, Mykola Makhortykh, Jaron Harambam, and Max van Drunen. 2020. "Explanations of News Personalisation across Countries and Media Types." *Internet Policy Review* 9 (4): 1–34.
- Ballo, I. 2015. "Imagining Energy Futures: Sociotechnical Imaginaries of the Future Smart Grid in Norway." *Energy Research & Social Science* 9: 9–20.
- Benkler, Y, et al. 2018. *Network Propaganda: Manipulation, Disinformation, and Radicalization in American Politics*. Oxford: Oxford University Press.
- Bodó, Balázs, Natali Helberger, Sarah Eskens, and Judith Möller. 2019. "Interested in Diversity: The Role of User Attitudes, Algorithmic Feedback Loops, and Policy in News Personalization." *Digital Journalism* 7 (2): 206–229.
- Bodrunova, S., and A. Litvinenko. 2016. "Fragmentation of Society and Media Hybridisation in Today's Russia: How Facebook Voices Collective Demands." *Zhurnal Issledovaniy Sotsial'noi Politiki* 14 (1): 113–124.
- Bodrunova, S, et al. 2017. "Content sharing in conflictual ad-hoc Twitter discussions: National patterns or universal trends?" Proceedings of International Conference on Digital Transformation and Global Society, 3–15. Springer.
- Bolsover, G., and P. Howard. 2018. "Computational Propaganda in Europe, the U.S., and China." In *Drums: Distortions, Rumours, Untruths, Misinformation, and Smears*, edited by N. Vasu, B. Ang, and S. Jayakumar, 61–81. Singapore: World Scientific.
- Bozdag, E., and J. Van Den Hoven. 2015. "Breaking the Filter Bubble: Democracy and Design." *Ethics and Information Technology* 17 (4): 249–265.
- Bruns, A. 2019. *Are Filter Bubbles Real?* Cambridge: Polity Press.
- Diakopoulos, N. 2015. "Algorithmic Accountability: Journalistic Investigation of Computational Power Structures." *Digital Journalism* 3 (3): 398–415.
- Diakopoulos, N. 2019. *Automating the News: How Algorithms Are Rewriting the Media*. Cambridge, MA: Harvard University Press.
- Eferin, Yaroslav, Yuri Hohlov, and Carlo Rossotto. 2019. "Digital Platforms in Russia: Competition between National and Foreign Multi-Sided Platforms Stimulates Growth and Innovation." *Digital Policy, Regulation and Governance* 21 (2): 129–145.
- Ekdale, Brian, Jane B. Singer, Melissa Tully, and Shawn Harmsen. 2015. "Making Change: Diffusion of Technological, Relational, and Cultural Innovation in the Newsroom." *Journalism & Mass Communication Quarterly* 92 (4): 938–958.
- English, P. 2016. "Twitter's Diffusion in Sports Journalism: Role Models, Laggards and Followers of the Social Media Innovation." *New Media & Society* 18 (3): 484–501.
- Eskens, Sarah, Natali Helberger, and Judith Moeller. 2017. "Challenged by News Personalisation: Five Perspectives on the Right to Receive Information." *Journal of Media Law* 9 (2): 259–284.
- Gaskarov, T. 2016. Budushee brauzerov i iskusstvennyi intellekt. Dzen v landeks.Brauzere. <https://habr.com/ru/company/yandex/blog/302856/>.
- Gillespie, T. 2014. "The Relevance of Algorithms." In *Media Technologies: Essays on Communication, Materiality, and Society*, edited by T. Gillespie, P. Boczkowski, and K. Foot, 167–193. Cambridge, MA: MIT Press.
- Gorton, W. 2016. "Manipulating Citizens: How Political Campaigns' Use of Behavioral Social Science Harms Democracy." *New Political Science* 38 (1): 61–80.
- Gusenbauer, M. 2019. "Google Scholar to Overshadow Them All? Comparing the Sizes of 12 Academic Search Engines and Bibliographic Databases." *Scientometrics* 118 (1): 177–214.
- Habrahabr. 2021. Users. <https://habr.com/en/users/>.
- Harambam, J, et al. 2019. "Designing for the Better by Taking Users into Account: A Qualitative Evaluation of User Control Mechanisms in (News) Recommender Systems." Proceedings of the 13th ACM Conference on Recommender Systems, 69–77. ACM Press.
- Haim, Mario, Andreas Graefe, and Hans-Bernd Brosius. 2018. "Burst of the Filter Bubble? Effects of Personalization on the Diversity of Google News." *Digital Journalism* 6 (3): 330–343.

- Helberger, N. 2016. "Policy Implications from Algorithmic Profiling and the Changing Relationship between Newsreaders and the Media." *Javnost - the Public* 23 (2): 188–203.
- Helberger, N. 2019. "On the Democratic Role of News Recommenders." *Digital Journalism* 7 (8): 993–1012.
- Hines, M. 2004. Google takes searching personally. <https://www.zdnet.com/article/google-takes-searching-personally-5000135157/>.
- Jiang, M., and K. Okamoto. 2014. "National Identity, Ideological Apparatus, or Panopticon? A Case Study of the Chinese National Search Engine Jike." *Policy & Internet* 6 (1): 89–107.
- Jananoff, S., and S. H. Kim. 2009. "Containing the Atom: Sociotechnical Imaginaries and Nuclear Power in the United States and South Korea." *Minerva* 47 (2): 119–146.
- Kanin, K. 2018. Yandex Filters & Algorithms, 1997–2018. <https://www.runetology.com/yandex-algorithms/>.
- Karimi, Mozghan, Dietmar Jannach, and Michael Jugovac. 2018. "News Recommender Systems – Survey and Roads Ahead." *Information Processing & Management* 54 (6): 1203–1227.
- Kukulin, I. 2020. "Internet, Heterochrony and Contemporary Russian Poetry." *Russian Literature* 116: 41–66.
- Makhortykh, M., and M. Bastian. 2020. "Personalizing the War: Perspectives for the Adoption of News Recommendation Algorithms in the Media Coverage of the Conflict in Eastern Ukraine." *Media, War & Conflict* (online first).
- Makhortykh, M, et al. 2020. "We are What We Click: Understanding Time and Content-Based Habits of Online News Readers." *New Media & Society* (online first).
- Maréchal, N. 2017. "Networked Authoritarianism and the Geopolitics of Information: Understanding Russian Internet Policy." *Media and Communication* 5 (1): 29–41.
- Martyanov, D, et al. 2019. "Is Cross-Network Segregation a Factor of Political Behavior and Political Identification in the Russian Student Community?." International Conference on Digital Transformation and Global Society, 165–176. Springer.
- McCoy, Jennifer, Tahmina Rahman, and Murat Somer. 2018. "Polarization and the Global Crisis of Democracy: Common Patterns, Dynamics, and Pernicious Consequences for Democratic Politics." *American Behavioral Scientist* 62 (1): 16–42.
- McGee, M. 2013. EdgeRank Is Dead: Facebook's News Feed Algorithm Now Has Close to 100K Weight Factors. <https://martech.org/edgerank-is-dead-facebooks-news-feed-algorithm-now-has-close-to-100k-weight-factors/>.
- Minak, C. 2020. Krupneishii resurs dlia IT-spetsialistov "Habrahabr" pokinul Rossiю. <https://www.forbes.ru/newsroom/tehnologii/392739-krupneyshiy-resurs-dlya-it-specialistov-habrahabr-pokinul-rossiyu>.
- Moeller, J, et al. 2019. *Filter Bubbles in The Netherlands?* Hilversum: Commissariaat voor de Media.
- Moeller, J, et al. 2020. "Explaining Online News Engagement Based on Browsing Behavior: Creatures of Habit?" *Social Science Computer Review* 38 (5): 616–632.
- Murzina, O., and A. Morozova. 2019. "Index.Dzen Kak Ploshadka Dlia Prodvizheniia Regionalnogo Informatsionnogo Saita." *Cheliabinskii Gumanitarii* 47 (2): 20–24.
- Napoli, Philip. 2018. "What If More Speech is No Longer the Solution: First Amendment Theory Meets Fake News and the Filter Bubble." *Federal Communications Law Journal* 70: 55–105.
- ni404. 2014. Zachem nuzhen blog na Habre: Opyt Madrobots. <https://habr.com/en/company/madrobots/blog/240887/>.
- Nissen, Volker, Tatiana Lezina, and Andrey Saltan. 2018. "The Role of IT-Management in the Digital Transformation of Russian Companies." *Foresight and STI Governance* 12 (3): 53–61.
- Newman, N, et al. 2016. *Digital News Report 2016*. Oxford: Reuters Institute.
- Pariser, E. 2011. *The Filter Bubble: What the Internet is Hiding from You*. New York: Penguin.
- Peko, Samantha, Hans Meyer, and Karlyga Myssayeva. 2019. "You Can't Censor Live: Technology Acceptance Drives Central Asian Journalists to Mobile and Helps Them Overcome Press Restrictions." *Media Asia* 46 (3–4): 63–77.

- Phillips, M.-K. 2018. How The Times Is Achieving Hyper-Personalisation with “JAMES, Your Digital Butler”. <https://www.twipemobile.com/how-times-achieving-hyper-personalisation-james-digital-butler/>
- Posetti, J. 2018. *Time to Step Away from the ‘Bright, Shiny Things’? Towards a Sustainable Model of Journalism Innovation in an Era of Perpetual Change*. Oxford: Reuters Institute.
- Puschmann, C. 2019. “Beyond the Bubble: Assessing the Diversity of Political Search Results.” *Digital Journalism* 7 (6): 824–843.
- Oleksiyyenko, A. 2020. “Is Academic Freedom Feasible in the Post-Soviet Space of Higher Education?” *Educational Philosophy and Theory* (online first).
- Ricci, F, et al. 2015. “Recommender Systems: Introduction and Challenges.” In *Recommender Systems Handbook*, edited by F. Ricci, L. Rokach, and B. Shapira, 1–34. Boston: Springer.
- Roberts, M. 2018. *Censored: Distraction and Diversion inside China’s Great Firewall*. Princeton: Princeton University Press.
- Rogers, E. 2003. *Diffusion of Innovations*. New York: Free Press.
- Schmitz Weiss, Amy, Vanessa de Macedo Higgins Joyce, Summer Harlow, and Rosental Calmon Alves. 2020. “Defining Journalism Innovation in Latin America: Exploration into Perceptions among Educators, Students, and Journalists.” *Journalism & Mass Communication Educator* 75 (4): 419–435.
- Shia, A. 2018. Recommendation System Behind Toutiao News App. <https://medium.com/@impxia/newsfeed-system-behind-toutiao-2c2454a6d23d>.
- Sørensen, J. 2013. “PSB Goes Personal: The Failure of Personalised PSB Web Pages.” *MedieKultur: Journal of Media and Communication Research* 29 (55): 28–71.
- Stravinskaia, M. 2008. Razvlechenie s garantiei. <https://www.kommersant.ru/doc/888375>.
- Sullivan, E, et al. 2019. “Reading News with a Purpose: Explaining User Profiles for Self-Actualization.” Proceedings of 27th Conference on User Modeling, Adaptation and Personalization, 1–5. ACM.
- Thurman, N., and S. Schifferes. 2012. “The Future of Personalization at News Websites: Lessons from a Longitudinal Study.” *Journalism Studies* 13 (5–6): 775–790.
- Thurman, Neil, Judith Moeller, Natali Helberger, and Damian Trilling. 2019. “My Friends, Editors, Algorithms, and I: Examining Audience Attitudes to News Selection.” *Digital Journalism* 7 (4): 447–469.
- Tlostanova, M. 2015. “Can the post-Soviet Think? On Coloniality of Knowledge, External Imperial and Double Colonial Difference.” *Intersections* 1 (2): 38–58.
- Tucker, Joshua A., Yannis Theocharis, Margaret E. Roberts, and Pablo Barberá. 2017. “From Liberation to Turmoil: Social Media and Democracy.” *Journal of Democracy* 28 (4): 46–59.
- Uskali, Turo, Ville Manninen, Pasi Ikonen, and Jere Hokkanen. 2020. “Diffusion of Drone Journalism: The Case of Finland, 2011–2020.” *Media and Communication* 8 (3): 75–84.
- Vartanova, E. 2015. “Russia: Post-Soviet, Post-Modern and Post-Empire Media.” In *Mapping BRICS Media*, edited by K. Nordenstreng and D. Thussu, 125–144. London: Routledge.
- Verovir. 2019. Sotsset’ v 2019: landeks zapustil “Auru”. <https://habr.com/ru/post/443956/>.
- Vkontakte. 2018. Chto takoe Prometei? <https://vk.com/@authors-prometheus>.
- Wijermars, M. 2021. “Russia’s Law ‘On News Aggregators’: Control the News Feed, Control the News?” *Journalism*. 1–17.
- Zabannyh, A. 2013. Internet dlia kazhdogo svoi. <https://yandex.ru/blog/company/71712>
- Zhang, S., and J. Feng. 2019. “A Step Forward? Exploring the Diffusion of Data Journalism as Journalistic Innovations in China.” *Journalism Studies* 20 (9): 1281–1300.
- Zuiderveen Borgesius, Frederik J., Damian Trilling, Judith Möller, Balázs Bodó, Claes H. de Vreese, and Natali Helberger. 2016. “Should we Worry about Filter Bubbles?” *Internet Policy Review* 5 (1): 1–16.

Corpus materials

- Akimova, N. 2017. “Psikhologichni Osoblivosti Vplivu Movlennevogo Etiketu Internet-Novin na Protses Īkh Rozuminnia.” *East European Journal of Psycholinguistics* 6: 12–20.

- alconost. 2018. Peremeny v interfeisakh, mnogoslaina animatsiia i strukturivannyi vizual'nyi khaos: Obzor veb-tendentsii na 2019 god. <https://habr.com/en/company/alconost/blog/433016/>.
- Allahverdov, A. 2018. Zhurnalistska po trebovaniu. <https://jrnlst.ru/outliermidia>.
- darikova. 2015. Chisto tekhnicheskii: Kak SMI stanoviat'sia interesnee s pomoshch'iu razrabotchikov. <https://habr.com/en/company/surfingbird/blog/294252/>.
- darikova. 2016. Kak uluchshit' kontent i biznes-strategiiu vashego media s pomoshch'iu prostykh priemov Google Analytics. <https://habr.com/en/company/surfingbird/blog/299218/>.
- Data_center_MIRAN. 2020. Pochemu prosto ne zapretit targetirovannuiu reklamu? <https://habr.com/ru/company/dcmiran/blog/493908/>.
- DevsStorm. 2019. Pochemu plokhoe, kogda Internet znaet o vas vse? <https://habr.com/ru/post/443430/>.
- Dudina, V. 2017. Zhurnalistska na mediaforume "3D Zhurnalistska"—2. <https://jrnlst.ru/zhurnalistska-na-mediaforume-3d-zhurnalistska-2>.
- FooBar167. 2020. Novosti mashinnogo obuchenii. Vypusk 8. <https://habr.com/en/news/t/486730/>.
- Funtova, D. 2017. "Tsennostnoe Prostranstvo Sovremennoi Kul'tury: Transformatsii, Kotorye my ne Zamecham". in *Nauchnye Shkoly. Molodezh' v Nauke i Kul'ture XXI v*, 61–62. Cheliabinsk: Cheliabinsk State University.
- FutureCollector. 2019. Udivitel'nye vozmozhnosti neirosetei 2019 goda. <https://habr.com/en/post/457710/>.
- Golubev, V. 2018. Facebook zminiue alorytm strichky: Sho teper robyty ZMI? <https://ms.detector.media/poglyad/post/20373/2018-01-15-facebook-zminyue-alorytm-strichky-sho-teper-robyty-zmi/>.
- Grigorova, Z. 2017. "Novi Media, Sotsial'ni Media, Sotsial'ni Merezhi—Ierarkhiia Informatsiinogo Prostoru." *Tekhnologija i Tekhnika Drukarstva* 3: 93–100.
- Gurov, F. 2019. "Opyt Sotsial'no-Filosofskogo Osmysleniia Problemy "Feikov" i "Puzyrej Fil'trov" v Seti." *Problemy Sovremennogo Obrazovaniia* 3: 9–20.
- Hradziushka, A. 2015. "Kampazitsyina-Stylistychniia Kharaktarystyki Tekstav Suchasnai Veb-Zhurnalistski Belarusi." *Rodnae Slova* 1: 34–37.
- Ishuk, T. 2015. "Personalizatsiia Informatsii v Merezhevii Komunikatsii: Perevagi Ta Nedoliki." *Naukovi Zapiski Institutu Zhurnalistski* 58: 134–139.
- Khrapovitskii, Andrei. 2017. 'Mir verkhnikh', 'mir nizhnikh': Pravda li, chto my stali slepymi rabami informatsionnykh tekhnologii? <http://tiny.cc/ju66tz>.
- Kliuev, L. 2019a. Kak rekomendovat' muzyku kotoruiu pochti nikto ne slushal. Doklad landeksa. <https://habr.com/en/company/yandex/blog/441586/>.
- Kliuev, L. 2019b. Avtorotsentrichnoe ranzhirovanie. Doklad landeksa o poiske relevantnoi auditorii dlia avtorov Dzena. <https://habr.com/en/company/yandex/blog/444040/>.
- Kornev, M. 2017. Virtual'noe dlia real'nogo: Novye izmereniia. <https://jrnlst.ru/content/virtualnoe-dlya-realnogo-novye-izmereniia>.
- Kozliuk, A. 2020. Aleksandr Pliushchev pro politizatsiiu interneta, tsifrovizatsiiu vlasti i robotov, kotorye zameniat zhurnalistsov (no eto ne tochno). <https://habr.com/en/company/roskomsvo-boda/blog/492112/>.
- kozyrevskaya. 2016. Ulutshit raboty krupneishego SMI ob internet biznese s pomoshch'iu kastomizirovannoi rekomendatel'noi sistemy. <https://habr.com/en/company/surfingbird/blog/310386/>.
- Kryvalap, A. 2018a. "Algorytmichnaia Kul'tura i Spazhyvanne Medya." *Iskusstvo i Kul'tura* 2: 85–88.
- Kryvalap, A. 2018b. "Stvarenne Identychnasti 'Shklianoga Chalaveka'." In *Veb-Programmirovaniie i Internet-Technologii WebConf2018*, 122–123. Minsk: BGU
- Lavnikovich, D. 2015. Glavnye trendy sovremennykh mass-media: popytka obzora. <http://mediakritika.by/article/2814/glavnye-trendy-sovremennykh-mass-media-popytka-obzora>.
- Lefter, S. 2015. 'Yandex. Novosti': kak ustroena rabota servisa. <https://ms.detector.media/onlain-media/post/15068/2015-12-02-yandeks-novosti-kak-ustroena-rabota-servisa/>.

- Maliukova, O. 2018. "Sovremennaiia Argumentatsiia: V Plenu u Feikov". *Uchenye Zapiski Krymskogo Federal'nogo Universiteta Imeni V.I. Vernadskogo. Filosofiiia. Kul'turologiia* 4 (4): 52–59.
- Matchuk, I. 2018. "Sotsial'ni Media Iak Komunikatsiina Platforma Evropeis'kogo Parlamentu". *Mizhnarodni Vidnosini.* *Politichni Nauki* 17: 1–15.
- MediaMedia. 2020. Izdatel' WSJ nazval personalizatsiiu novostei obiazatel'nym usloviiem vyzhivaniia novostnykh izdani. <https://jrnlst.ru/izdatel-wsj-nazval-personalizatsiiu-novostey-obiazatel'nym-usloviiem-vyzhivaniya-novostnykh-izdaniy>.
- Meleshko, E, et al. 2018. "Doslidzhennia Metodiv Pobudovi Rekomendatsiiniikh Sistem v Merezhi Internet. Sistemi Upravlinnia, Navigatsii Ta Zv'iazku." *Zbirnik Naukovikh Prats'* 1(47): 131–136.
- Miroshnichenko, A. 2017. Iskusstvennyi intellekt dlia SMI: Strakhi bol'she nadezhd. <https://jrnlst.ru/robots-threat>.
- Miroshnichenko, A. 2018. New York Times vkluchilas' v kastomizatsiiu. <https://jrnlst.ru/custom-article>.
- m1rko. 2019. Povtornaia detsentralizatsiia veba. Na etot raz navsegda. <https://habr.com/ru/post/436326/>.
- Nigmatullina, K. 2018. Perevospitanie robotov. <https://jrnlst.ru/ed-of-robots>.
- Nosaev, D., and I. Vidiashева. 2019. "Izdanie 'Meduza' Kak Iarkii Primer Sovremennogo Novostnogo Internet-Resursa." In *Traditsii i Innovatsii v Massovoi Kommunikatsii*, 158–160. Krasnodar: Kubaskii Gosudarstvennyi Universitet.
- Novikov, R. 2018. Itogi goda v presse: Rost krupnykh izdatelei i prevrashchenie v fabriki kontenta. <https://jrnlst.ru/press-trends-2019>.
- Podshibiakina, T. 2019. "Diffuzionnye Seti Rasprostraneniia Politiki: Kontsept, Kommunikativnaia Praktika i Kanal Politicheskoi Tsenzury." In *Materialy Vserossiiskoi Nauchnoi Konferentsii Politika v Setevom Obshestve*, 240–244. Krasnodar: Vika-Print
- ponchiknews. 2019. V poiskakh optimal'noi tochki prilozheniia chelovecheskikh resursov. <https://habr.com/en/post/452716/>.
- Potchepstov, G. 2017. Kognitivnoe prostranstvo i informatsionnye voyny. <https://ms.detector.media/mediaanalitika/post/19507/2017-08-20-kognityvnoe-prostranstvo-y-ynformatsionnye-voyny/>.
- Potchepstov, G. 2018. Desinformatsiia: opredelenie. <https://ms.detector.media/mediaanalitika/post/21225/2018-05-27-dezynformatsiia-opredeleniia/>.
- Potseluev, S., and T. Podshibiakina. 2018. "O Faktorakh Politicheskoi Radikalizatsii v Setevoi Kommunikatsii Posredstvom 'Ekhokamer'." *Nauchnaia Mysl' Kavkaza* 2: 29–34.
- Riabchenko, N., and O. Malysheva. 2019. "Transformatsiia Sotsial'no-Politicheskoi Kommunikatsii: Strukturno-Reliatsionnyi Analiz Fenomena Fake News." In *Materialy of 9th Mezhdunarodnaia Sotsiologicheskaia Grushinskaia Konferentsiia*, 46–53. Moscow: VTSIOM.
- Romanova, A. 2018. Rendakh v zhurnalistike, media i tekhnologiiakh. <https://jrnlst.ru/feature-today-institute>.
- Ryzhov, A., and P. Novikov. 2017. "Ob Odnoi Modeli Tsifrovyykh Privychek." *Intellektual'nye Sistemy. Teoriia i Prilozheniia* 21 (4): 91–100.
- qshnar. 2015a. Voina novostnykh agregatorov: Personalizatsiia ili kastomizatsiia? Opyt razrabotki prilozheniia Top Story. <https://habr.com/en/company/topstory/blog/381713/>.
- qshnar. 2015b. Prilozhenie Top Story – novosti, kotorye vas liubiat. <https://habr.com/en/company/topstory/blog/381937/>.
- Shestakova, A. 2018. "Tsifrovaia Lichnost': granitsy i Bar'ery Kommunikativnykh Praktik v Setevom Vzaimodeistvii." In *Materialy of 8th Mezhdunarodnaia Sotsiologicheskaia Grushinskaia Konferentsiia*, 422–426. Moscow: VTSIOM.
- Shestopalov, V. 2018. Otchet o tsifrovom mediapotreblenii. Chast' 2: rastet pokolenie skeptikov. <https://jrnlst.ru/digital-news-report-part2>.
- Shkorubskaya, E. 2018. "Kommunikativnoe Prostranstvo Seti Internet: Bunt Protiv Anonimnogo Izbytkha Informatsii". *Uchenye Zapiski Krymskogo Federal'nogo Universiteta Imeni VI Vernadskogo Filosofiiia. Kul'turologiia* 4: 86–99.

- Solov'ev, A. 2018. "Razrabotka Kontseptsii Generatsii Pol'zovatel'skogo Interfeisa Veb-Saitov na Osnove Analiza Danykh Poseshchenii Predydushchikh Saitov." *Research and Technology - Step into the Future* 13 (3): 21–22.
- Sukhodolov, A, et al. 2019. "Zhurnalistika s Iskusstvennym Intellectom." *Voprosy Teorii i Praktiki Zhurnalistiki* 8 (4): 647–667.
- Sumskaia, A. 2018. "Algoritimizatsiia i Personalizatsiia Kontenta Dlia Russkoiazychnykh Millenialov." *Izvestiia Ural'skogo Federal'nogo Universiteta. Problemy Obrazovaniia, Nauki i Kul'tury* 24 (1): 62–71.
- Sushpanov, A. 2016. "Distopiia Kommunikativnoi Epokhi: Vozmozhnye Prichiny." *Vestnik Rossiiskogo Khimiko-Tekhnologicheskogo Universiteta Imeni D.I. Mendeleeva: Gumanitarnye i Sotsial'no-Ekonomicheskie Issledovaniia* 1 (7): 116–124.
- Titov, K. 2017. "Vikorisannia Tekhnologii Kognitivnykh Obchislen' i Semantichnoi Obrobki Informatsii Dlia Fil'tratsii Novin za Personalizovanymi Vpodobanniami Koristuvacha." *Tekhnichni Nauki Ta Tekhnologii* 3 (9): 138–143.
- Ustinova, G. 2016. Mir posle pravdy. <https://jrnlst.ru/content/mir-posle-pravdy>.
- Vakhemans, A. 2018. INJECT: Instrument dlia povysheniia kreativnosti. <https://jrnlst.ru/inject>.
- Vas, Experts. 2017. Blokirovki internet-kontenta: O messendzherakh i sotsial'nykh setiakh. <https://habr.com/en/company/vasexperts/blog/341918/>.
- Vorzheva, O. 2016. "Tsifrovii Druk u Gazetnomu Virobnitstvi." *Kvalilogiia Knigi* 1: 77–79.
- Zhdanov, S. 2018. Tsifrovaia gigiena: kak pol'zovat'sia sotssetiami, ne davaia im ispol'zovat' vas. <http://mediakritika.by/article/5051/cifrovaya-gigiena-kak-polzovatsya-socsetyami-ne-davaya-im-ispolzovat-vas>.