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On the Democratic Role of News Recommenders

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ABSTRACT

Are algorithmic news recommenders a threat to the democratic role of the media? Or are they an opportunity, and, if so, how would news recommenders need to be designed to advance values and goals that we consider essential in a democratic society? These are central questions in the ongoing academic and policy debate about the likely implications of data analytics and machine learning for the democratic role of the media and the shift from traditional mass-media modes of distribution towards more personalised news and platforms. Building on democratic theory and the growing body of literature about the digital turn in journalism, this article offers a conceptual framework for assessing the threats and opportunities around the democratic role of news recommenders, and develops a typology of different ‘democratic recommenders’.

KEYWORDS

Algorithmic news recommenders; AI public sphere; democratic theories; diversity; democratic role of the media

Introduction

Are AI and algorithms a threat to, or an opportunity for, the democratic role of the media? Although it is clear that algorithmic news recommendations will have an important role in shaping the democratic contribution of the press, it is still subject to debate whether this development is for the better or the worse. There are those who warn about the potentially negative implications for democracy – filter bubbles, spheres, polarisation, fragmentation and the general demise of the public sphere (Pariser 2011; Sunstein 2001). Others are concerned about the “black box” character of recommenders and the difficulty of holding algorithms accountable for their public value implications (Diakopoulos and Koliska 2017). Yet others emphasise the opportunities that arise for the news media – opportunities to rejuvenate the media, allow more responsiveness to the interests of readers, deploy exciting new business models and find smarter, data-driven ways to engage with their audiences.

In the 2018 Reuters Report, almost three quarters of the editors, CEOs and digital leaders interviewed indicated that they were already experimenting with AI or were planning to do so (or were planning to do more experimenting), and that the

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particular focus of their initiatives would be, in addition to robo-journalism, algorithmic news recommendations (Newman, 2018, 29). The task of algorithmic news recommenders is to filter the growing abundance of online information. Generally, four types of news recommender algorithms can be distinguished, namely algorithms that make personalised recommendations on the basis of metadata (content based), insights into what other users like to read (collaborative filtering), data on their users (knowledge based), or a combination thereof (Karimi, Jannach, Jugovac, 2018). Another important distinction is that between self-selected recommendations (users determine the selection criteria and feed the system with their own preferences) and preselected recommendations (media determine the selection, based on volunteered or inferred data; Thurman and Schifferes 2012). Depending on the media outlet and the metrics that recommendation algorithms are being optimised for, news recommendations can be used to increase time spent, advertising revenues and user satisfaction, but also to actively guide readers and match individual readers with the news it is apt for them to receive. The focus of this article is on the latter, and it will be argued that the power to actively guide and shape individuals' news exposure also brings with it new responsibilities and new very fundamental questions about the role of news recommenders in accomplishing the media's democratic mission. How diverse or not diverse, and how personally relevant and inclusive should recommendations be? How far should the media go in engaging with the audience, and what is the role of other values, such as participation, transparency, deliberation and privacy? What are the longer term societal implications of personalised information exposure? And more generally, what are the objectives and values that recommendations should be optimised for?

In order to be able to answer these questions, we need more insights into the different values at stake and how personalised recommendations can positively or negatively affect the realisation of these values (Helberger, Karppinen, and D'acunto 2018; Helberger 2011). The objective of this article is therefore to explore how democratic theory can offer a useful frame for assessing the threats posed by news recommenders to the democratic role of the media, and the opportunities they present. In so doing, the article hopes to prepare the ground for a more nuanced discussion of algorithmic recommenders, AI and filter bubbles, and help to explore how news recommenders can contribute to democratic goals and editorial missions.

News Recommenders and Democracy – Hopes and Concerns

The media are a central institution in any democratic society (Balkin 2018) and they have at least two important roles to play. One is to inform citizens, to provide them with the information they need to make meaningful political choices and help to hold their democratically elected representatives accountable. Part of this information function is to critically investigate and report about important societal and political matters, and warn citizens about misconduct and problematic situations that require the attention of voters (the "watchdog function" of the media). The other is to create a diverse public forum where the different ideas and opinions in a democratic society can be articulated, encountered, debated and weighed. As we will see, the relative weight that the different theories of democracy attach to these two roles varies, and

in the case of news recommenders the roles can even conflict, which is an important source of concerns about the democratic role of recommenders.

Better Informed Citizens versus Concerns about the Demise of the Public Sphere

Many citizens consider recommenders a good way to get the news and to navigate their way through the growing abundance of information, and in some circumstances they even consider them preferable to journalistically curated choices (Thurman et al. 2018). The ability to filter and customise the information offer enables the media to be more responsive to the concrete information needs of users, and brings journalists one step closer to truly engaging with their audience. In so doing, algorithmic recommendations respond to an old criticism of liberal authors about the media patronising the user (Wentzel 2002) and the lack of media responsiveness, which some have even described as “one of the most difficult problems for media regulation” (Gibbons 1998). Usher (2010) predicts that audience tracking will “turn[...] journalism from elitism of writing for itself and back to writing what people are actually looking for.” Hindman goes one step further, arguing it is an obligation for journalists to use audience analytics, for exactly this reason (Hindman 2017). What is more, personalised news recommendations allow the media not only to help users find relevant information, but also to inform them better and more effectively. ‘The audience’ is not homogenous but consists of a diversity of audiences, each with its own preferences, interests and information needs, as well as different levels of education and ways of processing information. By using AI and algorithms, news recommenders can better accommodate these differences.

The ability to serve individual users better and more effectively is also the source of some of the most prominent concerns about the impact of recommenders on democracy. In an environment in which each user gets the news she needs, will there still be a public forum where diverse ideas and opinions can meet? Not only academics but also regulators warn that there is at least “a risk that recommendations are used in a manner that narrows citizens’ exposure to different points of view, by reinforcing their past habits or those of their friends” (OFCOM 2012). Lively debates about the extent to which news recommenders enclose users in filter bubbles (Pariser 2011) and echo chambers (Sunstein 2001) and about a public sphere that gradually dissolves into sphericules (Gitlin 1998) are essentially concerns about the tension between a media environment in which algorithms sort people into information profiles and interest bubbles, and the public forum function of the media. Concerns about a fragmentation of the media landscape with the effect that people no longer encounter counter-attitudinal or unexpected information and therefore become less tolerant, more polarised or even radical existed before the arrival of news recommenders (Helberger, 2006). What distinguishes the filter bubble scenario from more general concerns about the ongoing media fragmentation is the relative lack of user agency, particularly in instances of preselected recommendations, and the opacity of the process. Furthermore, with recommenders, stereotypes and prejudices can be reinforced through perpetual algorithmic feedback loops. As a consequence, the fault lines between the different

groups or fragments in society deepen, and in the worst case become impossible to bridge.

Hopes for, and Concerns about, the Future of the Media as a Democratic Institution

At a more structural level, scholars increasingly worry about the implications of AI and algorithms for the sustainable future of the media as an institution. Will the media still be able to independently observe and report what is worth reporting when it is no longer the editor who decides what is newsworthy, having been replaced by algorithms and the quantified interests and preferences of the audience? (Anderson 2011). Ferrer-Conill and Tandoc (2018, 13) are among those who warn that “[a]vailable metrics then become proxies to ... journalistic ideals, especially for overworked journalists.” An important factor in this context is the degree of internal and external commercial pressure (Coddington 2015) from advertisers (Turow 2005), and from other sources of “commercial optimisation” such as search engines, social media platforms and web analytics companies (Newman 2018, 31; Belair-Gagnon and Holton 2018, 15; see also Lewis and Usher 2016). The alleged opacity of algorithms (Diakopoulos and Koliska 2017) adds to these concerns, as this opacity can make it more difficult to identify external influences on the media, as well as to hold the media accountable for the way they carry out their democratic task and journalistic mission. Finally, in the digital environment the traditional media find themselves in fierce competition with truly digital natives, such as social media platforms and search engines, some of which have far more data than the traditional media, and far more expertise and experience in the competition for the attention of users (Moore 2016).

At the same time, data and data analytics offer the news media economic and strategic advantages, and could thus very well be a means for them to regain (and hold) both territory and the attention of their readers. Societal concerns about the lack of transparency and diversity and the danger of filter bubbles in the online environment also provide an opportunity for the traditional media to create a profile for themselves distinct from that of social media platforms that optimise for commercial goals that are very different from the goal of promoting better informed citizens and the public sphere. In addition, the ability to optimise for advertising (Newman 2018), paying readers and more efficient internal routines (Zamith 2018, 423) can help newsrooms both to make more sense of the media economy in which they operate and to survive in the “battle for audience attention” (Cherubini and Nielsen 2016, 9).

Concerns about Surveillance, Manipulation and the Erosion of Intellectual Privacy

If the task of the media is to inform citizens and provide a public forum, how much distance between the media and their audiences is actually needed to ensure that the media can fulfill this task? In other words, what is the role of data and privacy, and what are the potential dangers of the media knowing too much about their audience? Because many (though not all) news recommenders will use personal data to optimise

their results and better match results with individual users, new concerns about this constant tracking and monitoring accompany the media's quantitative turn. As Richards (2008, 392) explains, a certain measure of intellectual privacy is "critical to the most basic operations of expression, because it gives new ideas the room they need to grow". The constant surveillance can also affect more directly the democratic role of the media, for example where there may be chilling repercussions for users' exercise of their free speech rights, or where digital technology is used to manipulate opinions. Put differently, protecting the privacy of their users can be a way of protecting the very activity we expect media users, as citizens, to engage in, namely critical and diverse thinking.

As this brief overview shows, the debate about the role of news recommenders in a democratic media landscape has been characterised by varied hopes and concerns, assumptions and anecdotal evidence. Some of these hopes and concerns contradict, others seem unconnected. What is missing is a conceptual framework for assessing the threats and opportunities of news recommenders that helps to critically question some of the assumptions made and, more generally, to understand news recommenders in the broader context of the democratic role of the media. This is why the next section takes a step back and, building on theories of democratic media, sets out to develop such a framework.

A Conceptual Framework for Assessing the Democratic Role of News Recommenders

Many excellent scholars have developed theories of democracy and the media – work that has contributed greatly to informing our expectations about the role that the media and informed citizens should play in a democracy (Christians 2009; Strömbäck 2005; Dahlberg 2011; Ferree et al. 2002; Curran 2015). Their work forms the point of departure for the current investigation. Given the central role that the media play in a democratic society, democratic theories form a logical normative framework to concretise the societal role of the media, as well as to evaluate their performance. This article argues that, by extension, the same must be true for news recommenders, to the extent that news recommenders are a tool for the media to fulfill their roles. Since it would be impossible to recount all democratic theories within one article, this article focus on what are arguably the three main and most commonly used theories in academic work on the media (Karpinen 2013b): liberal, participatory and deliberative theories. Carving out the different theoretical approaches behind these theories will allow the development of three different perspectives on the democratic role of recommenders. Although it would undoubtedly be extremely interesting to discuss news recommenders against the background of a far richer and more differentiated approach to democratic theory (such as critical democratic theory, which this article only briefly touches upon), space is limited and the main point that this article wishes to make is that there are multiple ways in which recommenders can contribute to the democratic role of the media, provided they are developed out of a vision of the values that recommenders are used to serve. Different democratic theories foreground different values and expectations for news recommenders.

Liberal Models of Democracy

Within the liberal tradition, further distinctions are made, such as Christians' pluralist model (Christians 2009), which corresponds largely with Strömbäck's (2005) competitive model of democracy, or Curran's (2015) rational choice model. Common to all these perspectives is the idea of a decentralised model of political power, where different groups and ideas compete for influence and ultimately political power in the "market place of ideas" (Napoli 1999; see also the critical analysis by Karppinen 2013a), and do so unhampered by the state or other institutions. Central shared values are individual freedom – including fundamental rights such as the right to privacy and freedom of expression – dispersion of power, personal development and autonomy.

The challenge for liberal democracy is to eventually aggregate all these different views and ideas into political will in a process that Christians (2009, 97) describes as "constant negotiation". Accordingly, elections are a central democratic moment. It is at election time that citizens can express their political will, by voting for the party that best represents their interests. In the liberal model, democratic participation and being a good citizen therefore largely revolve around the act of voting, as opposed to more participatory or deliberative models where citizens' active participation in the public discourse is far more central. As Ferree et al. (2002, 290) put it: "Citizens need policy makers who are ultimately accountable to them but they do not need to participate in public discourse on policy issues. Not only do they not need to, but public life is actually better off if they don't."

With respect to the information needs of citizens, this means that there is little reason why citizens should not read and watch what they like, as long as in the run-up to elections, they are sufficiently informed to cast their votes (Ferree et al. 2002, 291). There is a strong focus on personal autonomy – the freedom to choose the information one is interested in. What does that mean for the information role of the media? If one follows Christians (2009, 100), "[r]ather than trying to inform citizens about issues over which they have no direct and immediate control, journalism serves an administrative democracy by alerting the community to crises ... [and providing] detailed accounts of campaign promises and platforms, especially during the months preceding a contested election" (in a similar vein, Strömbäck 2005, 335). This is Zaller's "burglar alarm" standard, where rather than aspiring to an ideal (and unrealistic) situation in which citizens are broadly informed on all matters relevant to public affairs, the media instead must make them aware of acute problems that merit their immediate attention (Zaller 2003).

Implications for a Liberal Recommender

From the perspective of liberal democratic traditions, recommenders, then, could potentially have quite literally laiberating role, to the extent that they put the interests and information preferences of users centre stage. True, the orientation towards the user, and the possible resulting hyper-responsiveness of the press, might result in a situation in which newsrooms select content based on users' preferences, and not on what the audience 'ought to know'. But how worrisome are these concerns under a more liberal perspective on democracy? From the liberal perspective, it is essentially a

prerogative of citizens to decide which information they need so they can make well-informed decisions, and they should be able to do so free from external influences. And if citizens primarily choose to look at cat videos and celebrity news? Under more liberal conceptions of democracy, that could be perfectly fine as long as doing so is a result of the way they exercise their autonomy and freedom of expression. Or to quote Strömbäck (2005,334): “How people choose to spend their time and their mental energy is up to themselves, as long as they do not violate the basic democratic freedoms and rights. To demand that people in general spend their lives keeping up with the news, getting informed, and participating in public life, is to demand too much.”

It may be that people have already gathered from other sources the information they need to make informed decisions, for example from non-personalised parts of the website or conversations with friends. It may be that the citizen can actually be trusted to demand the information that she needs to cast an informed vote. It may also be that newsrooms are not the perfect and uncontested arbiters of what citizens “need to know” (Boczkowski 2013). The point is: user-driven content choices do not necessarily have to be undemocratic, and the same is true for news recommenders that provide users with user-driven recommendations. There is arguably some minimal information that the population should receive, for example information about democratic, economic and social crises. This information, however, does not necessarily need to be provided in the form of recommendations; it could be offered as part of the general website, with the recommender being nothing more than an added service. One could also argue that recommendations could differ during and outside election times, and that the balance between what people want to know and what they need to know to take informed election decisions could vary. What is important is that no opinion should intentionally be excluded (Ferree et al. 2002, 293). Whether or not it is prominently presented, or even ranked high enough to be noticed, will depend on its popularity and the size of the audience that wants to hear that view. In other words, there is no obligation to provide equal representation; nor is there a right to an audience (Christians 2009; Napoli 2011, 108). It would be perfectly logical for a recommender to give more prominence to those ideas that have the greatest popularity or dominance within society.

A necessary precondition is, of course, that a recommendation does realise users’ autonomy and right to receive information (Eskens, Helberger, and Möller 2017). While it is true that recommenders can potentially make the media more responsive to the information needs of, and demands from, citizens, recommendation technologies can also ignore or misinterpret signals from users (Ekstrand and Willemsen 2016). Much will depend on the quality and the sophistication of the analytics and metrics, and the extent to which they are truly able to uncover people’s news needs and interests (Hindman 2017, 189). If algorithms are used to nudge or influence citizens against their will (Calo 2014) or in an attempt to manipulate their political choices, then they pose a danger to liberal democracies. From a liberal perspective, then, perhaps the more important point of attention regarding the potential democratic role of recommenders is their editorial independence from external parties, such as advertisers, political parties or marketing divisions. Another important point of attention under the

liberal model would be the extent to which the control over algorithmic recommenders and, perhaps even more importantly, the datasets needed to fuel them, could lead to the creation of new concentrations of market or opinion power, for example in the form of social media platforms. From the perspective of liberal democracy, and its strong focus on the dispersion of power (compare (Karppinen 2013a, 31: dispersion of power as “the basis of liberal democracy”; Edwin Baker 1998), this is a serious threat to democracy. From the perspective of public policy, herein lie two tasks, namely to prevent data-driven concentrations of opinion power and to ensure that recommenders do indeed reflect the free and autonomous choices of citizens, rather than becoming tools for manipulating public opinion and tinkering with citizens’ minds.

A more liberal perspective on democracy would also suggest a more organic and more “interest-driven” approach to diversity. So far, diversity has mostly been discussed in terms of what the audience ‘needs to know’. With a more liberal recommender, it would be perfectly acceptable to speak of information that the heterogeneous citizenry “wants to know.” Therefore, a well-designed, diverse recommender would also incorporate a certain element of flexibility, allowing citizens to customise the recommendations to better reflect their interests and preferences, even if not all users will make use of that opportunity, a decision that would be fine as long as it constituted an expression of their autonomy (Harambam et al. 2018). In fact, pre-selected choices, particularly when they do not allow citizens to understand why they have received particular recommendations, or do not provide them with the means to influence the settings, are suspicious from a liberal theory point of view. One could even go a step further and argue that a liberal recommender would do more than just inform people. It would also allow people to have a say regarding the proper balance between their right to information and personal development, and other rights, such as the right to privacy. Seeing that algorithmic news recommendations operate through the collection of large amounts of data, offering users a choice between receiving relevant information and reading anonymously, or perhaps using recommenders that personalise on the basis of meta-data rather than on the basis of users’ inferred interests, would fit perfectly well in the liberal tradition of putting individual rights and freedoms centre stage. This is not to say that the rights to privacy and data protection are less relevant under the other democratic perspectives, but it is under the liberal perspective that a strong argument can be made that the right to privacy, personal autonomy and freedom of expression can outweigh other interests, such as displaying particular “public interest content” more prominently, or nudging users to consume more diverse or more “valuable” information and engage more with the perspectives of others.

How about concerns over filter bubbles? Interestingly, from a more liberal perspective one could argue that a situation in which users are recommended exactly the information that they request or find interesting could help them to deepen their knowledge and expertise, and thereby enable them to play their role in the democratic process even better and more efficiently. Much depends on the conception of what an ‘ideal’ citizen is – an information omnivore, an “expert citizen” or an “everyday maker?” (compare Li and Marsh 2008). Particularly interesting here is the role of experts in more liberal models of democracy. As Ferree et al. (2002, 292)

explain, the relatively low normative expectations of what it means to be a good citizen are counterbalanced by a prominent role for experts “in defining the issues before they reach the stage at which decisions need to be reached.” In other words, under more liberal democratic models recommenders that feed the focused information needs of expert citizens could fulfill an important role in a democratic society. In such a situation, filter bubbles become “expertise bubbles” and have an important role in helping expert citizens to become even more expert. We could possibly also see the development of two, or even more, types of recommenders: “general interest recommenders” – which serve people’s diverse information needs and preferences – and more “expert” recommenders, which help to make the experts more expert. Indeed, from the perspective of dispersion of power, pluralism in the future could extend not only to a diversity of media sources and content, but also to a diversity of recommenders for a diversity of user needs.

Participatory Models of Democracy

In contrast to the libertarian focus on autonomy, user agency and dispersion of power, the central focus of more civic (Christians 2009, 101), respectively participatory (Strömbäck 2005) or republican models of democracy is on a shared civic culture and commitment to citizenship (Christians 2009, 102). And unlike in the more liberal model discussed in the previous section, in the more participatory understanding of democracy, the active participation of citizens is key and the central mechanism for political will formation. Only if all citizens are (at least in theory, and ideally in practice) able to actively participate, have their say or even exercise political functions, can we speak of a true participatory democracy. Accordingly, the values that proponents of more participatory models of democracy bring to the fore are very different from those emphasised by proponents of the liberal model: inclusiveness instead of representativeness; equality and tolerance instead of proportionality; and community, active participation and civic virtue instead of self-development, autonomy and ultimate freedom.

In the discussion about the democratic role of recommenders, two ideas are particularly relevant: one is that societal interest trumps individual self-interest, and the other, which is closely related, is that there are high normative expectations of what it means to be a good citizen. Central to advancing welfare is not the sum of individual actions (or preferences), but active collaboration, engagement and subordination to the common good (Etzioni 1996). This ideal of more or less direct self-government cannot be achieved without a certain moral attitude of the citizen or “*homo politicus*” (Held 2006, 29). This is a citizen who cannot afford to be uninterested in politics and who understands that political participation is “a necessary aspect of the good life” (Held 2006, 35) or at least absolutely necessary to secure one’s own liberty and that of the community.

It is clear that with the more active political role of the citizen, the information needs of the citizen change. Instead of having a basic knowledge of political institutions and political alternatives, the active, informed citizen needs to have a far deeper knowledge of not only the political system, but also the different issues on the

political agenda – even more so to the extent that she is interested in playing an active part in the making of politics. Accordingly, the media have an important task in satisfying citizens' demands for in-depth information - documentaries about social issues, background information and more general information about the political climate (compare Strömbäck 2005, 339). Arguably, and in stark contrast to the liberal model, the role of the media, and here in particular the public service media, shifts from merely informing to actively educating and coaching the active citizen. Tandoc and Thomas (2015, 244) characterise this position well: "If journalism is to help bring about the common good, it must provide the public with more than just what the public wants."

Here, also, the expectations with regard to diversity are greater; there is a different and potentially more demanding idea of what constitutes a diverse information offer. Diversity is less about presenting alternatives and accommodating the heterogeneous interests of a heterogeneous citizenry. Diversity must represent "all significant interests in society" (Curran 2015), including political parties, political, economic and civil society interest groups, religious groups, professional organisations, and so on. A diverse media offer speaks to the different groups in society and inspires them to take an active part in society. Inclusiveness is critical (Edwin Baker 1998, 334; Balkin 2018), as is visibility. Only when citizens are aware of the different perspectives, interests and concerns in a society and are able to tolerate and even further them, is political participation deserving of the name. For the media in the digital environment, this creates an extra challenge: to order and present content in such a way that it reflects the diversity of ideas and opinions. This necessitates not only a process of inclusion but also a process of exclusion. In other words, the information task of the media includes making responsible selections, and also making conscious decisions about what not to show because the attention span of people is limited and screen space is scarce. Or, in the words of Meiklejohn (Meiklejohn 1948), 19): "What is essential is not that everyone shall speak. But that everything worth saying shall be said." It becomes clear that news recommenders, as ultimate selection tools, can have a very important democratic role to play in a participatory democracy.

Please note that, so far, participation has been discussed primarily with reference to the public as a whole. Participation as a democratic value can also require consideration of those who are typically excluded from participation, such as marginalised groups or minorities. This is particularly the case under more critical theories of democracy that require citizens to discover and experience the many marginalised voices in public and private life. Arguably, this could even mean privileging marginalised voices so they "can offer the 'double vision' of those who are 'outsiders within' the system" (Ferree et al, 2002, 307).

Implications for a Participatory Diverse Recommender

The particular challenge and opportunity for the participatory recommender will be to make a selection that gives a fair and inclusive representation of different ideas and opinions in society, while also helping a user to gain a deeper understanding and to feel engaged, rather than confused, by the abundance of information out there.

Instead of simply giving people what they want (at this particular moment), a participatory recommender will be committed to a far more principled understanding of “participatory diversity.” It must proactively address the fear of missing out on important information and depth, as well as concerns about being left out. The participatory recommender is not simply a smarter means to increase user satisfaction and better serve readers: it becomes an important element of active curation of the digital news offer.

Arguably, even though the main thematic focus of the participatory recommendations will be on political content/news, non-political content must also be fairly represented, so as to enable ordinary people to reflect on daily-life challenges and issues and how they can be approached. For the same reason, in-depth discussions, background content and commentary will also become more important. Alternatively, a news medium might decide to leave the task of presenting a diverse selection of content to the front pages, and instead use recommendation technology to recommend further reading, in-depth information on similar topics and historical items about the same topic from the archive. Overall, the performance of a diverse recommender that seeks to promote active involvement in politics will be measured by its success in addressing and mobilising all groups in society.

More attention is also required concerning the form in which the news is delivered. Because the ultimate goal is participation, recommendations should seek to galvanize. The media “should frame politics in a way that mobilizes people’s interests and participation in politics” (Strömbäck 2005, 340). To be truly empowering, media content therefore needs to be presented in a diversity of formats and communication styles (Ferree et al. 2002, 298; Christians 2009, 102; Zaller 2003, 122). Where the mission is to stimulate active participation, more engaging, emphatic, emotional, critical and even activist tones should be used. And where the objective is fostering tolerance, the general tone may be more reconciliatory, non-threatening, non-sensationalist, rational, and compassionate.

But the participatory recommender is potentially more than a tool to inform. Taking seriously the idea of the role of the news media in engaging and galvanizing the readership, participatory recommenders can have an important role in actively coaching and engaging users. If a user spends a large amount of screen time on celebrity news or sports, a recommender could nudge her to also try some political news. If a user prefers to sit in her own left/right/centrist bubble, a responsible participatory recommender could recommend content from a different perspective. Preselected recommenders, in particular, offer clear opportunities in that context. And seen from the perspective of more critical democratic theories, recommenders could be turned into even more powerful instruments to draw our scarce attention to the marginalised, invisible or less powerful ideas and opinions in societies with the objective of escaping the muffling standard of civility and the language of the stereotypical “middle-aged, educated, blank white man” (Young 1996, 123–124).

Clearly, actively nudging users also invokes tricky ethical questions about the fine line between information, education, and manipulation (Spahn 2012), as well as the media’s responsibility to “pop” filter bubbles. Filter bubbles, in the sense of filtering decisions that include like-minded and exclude different-minded content, can be a real concern for a participatory democracy. A worrisome outcome from the

participatory democracy perspective is a situation in which certain people will never become aware of particular ideas and opinions in society, with the filters “ghettoizing citizens into bundles based on narrow preferences and predilections rather than drawing them into a community” (Tandoc and Thomas 2015, 247). Having said that, in certain circumstances filter bubbles can also be conducive to the values of a participatory democracy (and even more so under certain critical theories of democracy). Filter bubbles could be a very good thing to the extent that they act as incubators of constructive speech, allowing the more marginalised voices in society to join forces and pluck up the courage to speak out (compare Ferree et al. 2002, 309). This involves a challenge for the media, academics and policymakers to establish clear guidance on how a diverse recommender design can actually help to promote a vibrant, inclusive and diverse media landscape, as well as include and galvanize disengaged or uninterested segments of the population. The combination of news recommendations and social media functions could offer interesting perspectives, as long as the media, platforms and policymakers succeed in controlling undesirable side effects, such as hate speech, the spread of misinformation and the abuse of digital technology to polarise and radicalize.

In a situation where algorithmic selection decisions are driven more by editorial logic than by individual citizens’ information needs, and the societal function of the media comes more to the fore, the ability of society to hold the media accountable for algorithmic selection decisions becomes more important. Much of the criticism levelled at algorithmic news recommendations is centred on their opacity and ‘black box’ character (Diakopoulos and Koliska 2017). This lack of transparency and the consequent inability of the community to hold the media accountable can be particularly problematic from the participatory democracy perspective, where “freedom of the press exists to serve the interests of the community, not the interests of journalists and their manager. The community, rather than market forces or even the newsroom itself, needs to be the final arbiter of journalism’s quality and value” (Christians 2009, 104). Transparency about the editorial logic behind recommendations and why citizens are being shown certain content and not other content becomes not only a matter of compliance with data protection laws’ requirement of explainability, or a way to enhance personal agency, but also a matter of central democratic interest: transparency in this sense makes it possible for the community to hold the media accountable and to judge the value of recommendations.

Deliberative (or Discursive) Models of Democracy

The participative and the deliberative models of democracy share a focus on community, the placing of societal interest above individual self-interest, and the importance of active, interested citizens. One of the major differences, however, is that the deliberative model operates on the premise that ideas and preferences are not a given, and that we must focus more on the process of identifying, negotiating and, ultimately, agreeing on different values and issues (Ferree et al. 2002, 300; Held 2006, 233). This involves a process of actively comparing ideas, and engaging with ideas that may be contrary to our own (Manin 1987). Or as Timothy Garton Ash (Garton Ash 2016,

212) has put it so succinctly: “I cannot fully express myself – that is, my self – unless I identify my differences with others.” Doing so requires a sphere of mutual shared values and equality: “The dynamics of deliberative democracy are characterised by the norms of equality and symmetry; everyone is to have an equal chance of participation” (Dahlgren 2006). With regard to the role of the media, the deliberative conception of democracy thus places particular emphasis on the media’s public forum function. In addition to fostering critical values such as deliberation, critical and rational reflection, equal chances to participate, tolerance and open-mindedness, creating a public forum and optimal conditions for engagement becomes a value in itself.

Under a deliberative perspective, it is thus not enough to “simply” inform people. The media should provide “an arena for everyone with strong arguments and direct its attention to those who can contribute to a furthering of the discussion” (Strömbäck 2005, 341). Not only is this an invitation for the media to actively guide users’ attention; it suggests the media also have a duty to proactively confront the audience with different and challenging viewpoints that they have not considered before, or not in this way: “Deliberation requires not only multiple but conflicting points of view because conflict of some sort is the essence of politics” (Manin 1987, 352). Here, diversity becomes instrumental in challenging users to compare and modify their opinions and broaden their horizons. What is more, exposure to diverse information is essential as a means of fostering a certain open mindedness and tolerance, or what Ferree et al. (2002, 303) call “readiness for dialogue.” Only if people are actually interested in, and curious about, the positions of others, or are motivated to research different perspectives on a particular subject, are they ready to engage in critical reflections with themselves and deliberations with others. Interestingly, diversity in this reading acquires an almost personalised component: in the deliberative tradition the recommendation that is truly diverse is that which can challenge a particular individual; that is, recommendations that exposes her to ideas and opinions she has not previously been exposed to and challenges her established beliefs. But as users cannot deliberate upon all ideas and opinions (Manin 1987, 356), some element of purposeful filtering is necessary, particularly under the deliberative perspective.

Implications for a Deliberative Recommender

It is under the deliberative conception of democracy that algorithmic recommendations can present the greatest opportunities to the democratic process, as well as the most profound threats. Not surprisingly, the main critics of algorithmic filtering come from this tradition and warn about polarisation, fragmentation and filter bubbles. This is because under the deliberative tradition in particular, the ability to inform people in a more targeted, personally effective way clearly clashes with the second, public forum function of the media. Using recommendations to limit people to information that they find agreeable and that appeals to their own interests, excluding voices that challenge, and depriving them of a comprehensive overview of the different ideas and opinions that exist in a society, is in direct conflict with the deliberative ideal.

But recommendations could also be used in a completely different way: precisely because they are data-driven, recommenders can also take each individual’s different

ideas, beliefs and opinions and use them as points of departure, suggesting alternative viewpoints that the individual has not yet thought of. Interestingly, personalisation could become a critical feature of a deliberative recommender, as it allows particular individuals to be challenged and exposed to ideas and opinions that they would not have come across on their own. Thus, news recommenders' democratic role may be not only to inform users but to educate them and nudge them to broaden their horizons and make them practised in tolerance. Recommenders could expose the reader to extra, in-depth background material. They could present different perspectives alongside each other, and also make the user aware of what her current place is in the ideological spectrum. They could become an important instrument for fostering critical reflection and open-mindedness.

This means that the path to realising the opportunities offered by algorithmic recommendations and the path to countering the threats they pose are actually one and the same: diversity-sensitive design. Recommenders can be designed using relatively simple metrics such as clicks and likes, or what content friends liked, but there is no reason why recommendations cannot employ more sophisticated metrics. The real challenge for academics, policymakers, editors, journalists and the developers of recommender algorithms is to jointly conceptualise diversity in terms of metrics that deliberative algorithms can be optimised for. The overall goal must be to ensure that citizens remain exposed to a diversity of information, and to counter the undemocratic effects of recommendation that make a significant impact on public opinion formation in a way that is counter-productive to a general "readiness for dialogue" in parts of the population.

Specifically, in recommendations where the focus is more on fostering tolerance and open-mindedness, the ratio of content featuring different cultures and different ethnic, national and linguistic groups, or representatives thereof, will be more relevant, as will presenting content in different languages and giving prominence to content that describes shared experiences ("challenging diversity"). And while under the representative liberal model it would probably be acceptable if the recommender presented a proportionally larger share of content that conforms to the ideas and opinions of political majorities, what is key under the deliberative model is not proportionality, but equality.

A deliberative recommender will be successful if it can contribute to mutual understanding, foster open-mindedness and help people to look beyond their own narrow-minded horizons. One can also imagine that a deliberative recommender will strive to present a greater amount of balanced content, commentary, discussion formats and background information, as well as articles that present various perspectives and a diversity of emotions, from a range of different sources and tailored to the background, level of expertise and interests of the user. Such a deliberative recommender could give particular visibility to public service media content, at least to the extent that the public service media in a particular country has the function of fuelling and facilitating the public discourse. It could also offer additional social features for users to comment, engage, agree/disagree and debate.¹ Finally, serendipity could play a far larger role here as well, to the extent that serendipitous encounters can promote open-mindedness and mental flexibility (Schoenbach 2007).

To stimulate reflection and informed debate, not only the content but also the tone and style of the information provided must promote active discourse, as tone and style are “at the heart of the discursive tradition” (Ferree et al. 2002, 301). The focus will be on styles of communication that are impartial rather than polarising, and rational rather than emotional, and informative styles will be favoured over provocative ones that grab the user’s attention and force her to focus on one particular viewpoint.

Finally, transparency about the logic behind including or excluding views and opinions plays an almost fundamental role in this type of recommender. More than in any other democratic conception of recommendations, it is important that people are aware of the “editorial analytical” choices (compare Cherubini and Nielsen 2016, 21) so that they do not assume they are receiving a comprehensive overview of the relevant ideas and opinions when they are not.

Four Types of Democratic Recommenders

So far three distinct types of algorithmic recommenders have been identified, and a fourth hinted at: the liberal, participatory, critical and deliberative recommender. Their main characteristics are summarized in the [Table 1](#).

It can be argued that the first wave of recommenders corresponded with the liberal model of democracy. Liberal recommenders can be found on social media platforms or in early news personalization projects. Liberal recommenders offer users personally relevant information. Often criticized for supposedly narrowing users’ views, from the perspective of liberal democracy, liberal recommenders serve perfectly legitimate goals. A necessary pre-condition is that users still have the choice to gather information about politics from alternative sources and that their privacy and personal autonomy are respected.

The strong focus on user-driven recommendations may not sit easily with the editorial ambitions of some of the quality media that envision a more active role in society. These news outlets may prefer a more engaging, participatory recommender. Participatory recommenders will strive to map the diversity of ideas and opinions in society, and use the affordances of digital technology to respond to differences in information needs, styles and communication preferences.

Conforming to more deliberative conceptions of democracy, deliberative recommenders would need to do more – they would also need to find ways to re-create common spaces in an increasingly fragmented media environment. Exposing users to information that they may not have looked for, deliberative recommenders are tools for educating users to remain open to new or different voices in society. It is unlikely that the deliberative recommender can be found on social media platforms or in some of the commercial media, but this type of recommender could be a viable option for public service media.

Finally, the article has briefly touched upon more critical recommender types, recommenders that nudge people to encounter and acknowledge minority opinions, push readers out of the comfort zone of established opinions and engage the more marginalized voices in society. As unlikely as it is that such a type of recommender

Table 1. Four types of democratic recommenders.

Recommender	Liberal	Participatory	Deliberative	Critical
Values to optimize for	Autonomy, self-development, dispersion of power	Inclusiveness, participation, active citizenship	Deliberation, tolerance, open-mindedness, public sphere	Including marginalized voices, defy prejudices
Characteristics	<p>More prominence for more prominent topics</p> <p>Main political issues, particularly during election time</p> <p>For the rest: little distance from personal preferences</p> <p>Choice between different formats, topics, genres, sources</p> <p>Choice of recommendation logics</p> <p>Expert recommenders</p>	<p>Tool of active editorial curation, drawing attention to items that citizens “should know”</p> <p>Activating</p> <p>Inclusive and proportional representation of main political/ideological viewpoints in society</p> <p>Focus on political content/news, but also: non-news content that speaks to broader public</p> <p>Background information</p> <p>Political advertising</p>	<p>Higher share of articles presenting various perspectives, diversity of emotions, range of different sources</p> <p>Equal representation, including content dedicated to different ethnic, linguistic, national groups</p> <p>Balanced content, commentary, discussion formats, background information</p> <p>Prominence public service media content</p> <p>Personalised nudging to consume news content this citizen should know</p> <p>Preference for rational tone, consensus seeking, inviting commentary and reflection, social media elements</p>	<p>Prominence for less popular content, minority and marginalized voices</p> <p>Actively nudging</p> <p>Critical tone</p> <p>Content that is purposefully provocative, opposes, challenges</p>
Form and presentation	Possibilities for active user curation, autonomy enhancing, no nudging, privacy friendly design, data portability	Accessible, multi-platform, heterogeneity of styles and tones, can be emotional, empathic, galvanizing, reconciliatory, transparency and accountability		Heterogenous, narratives, preference for contents that are affective, emotional, provocative, figurative

would develop under normal market conditions, critical recommenders could turn into interesting tools for NGOs, civil rights groups but also the public service media.

Concluding Remarks

News recommenders can both pose threats to, and offer real opportunities for the democratic role of the media. This is why it is so important to implement the technology with a profound understanding of the democratic values algorithmic recommendations can serve. Too often news recommenders are developed as part of an R&D project, or with purely commercial objectives in mind. Inspired by democratic theories of the media, this article has developed a framework for theorizing about the democratic potential of algorithmic recommenders, and identified three types of democratic recommenders (and hinted at a fourth one). Different democratic theories place different values on, and have different expectations concerning, the role of the media and making citizens central. Sometimes these expectations can conflict. Whereas under more liberal perspectives that emphasise privacy, autonomy and self-development, recommenders that make recommendations based on users' interests function well and have a clear democratic role, the same recommender would be assessed very poorly under more participatory conceptions that place societal interest above individual self-interest. Similarly, a participatory recommender that succeeds in informing and galvanizing different users through personalised information could still be a concern under a more deliberative model that prefers a reconciliatory, balanced tone to contributions that inspire and engage. In other words, there is no gold standard when it comes to democratic recommenders and the offering of diverse recommendations. This is why there is a typology of recommenders and different avenues the media can take to use the technology in the pursuit of their democratic mission.

Another important insight derived from this analysis is that the potential anti-democratic effects, such as filter bubbles and restricted diversity, cannot be studied in isolation, but need to be considered in relation to the values at stake. So instead of simply asking whether, as a result of algorithmic filtering, users are exposed to a limited media diet, we need to look at the context and the values one cares about. Depending on the values and the surrounding conditions, selective exposure may even be instrumental in the better functioning of the media and citizens. Also, as this article has shown depending on the democratic theory one follows, diversity in recommendations can take very different forms, from more "interest-driven" liberal conceptions of diversity, to more galvanizing forms of "participatory diversity," to more inclusive forms of "challenging diversity."

The more a democratic theory focuses on furthering societal goals rather than individual self-development, the stronger the arguments are to move away from simple, short-term metrics such as clicks towards more sophisticated metrics and responsible, editorial mission-driven design. Clearly, there is a challenge here for the media as well as for policymakers to engage in more active consideration of how recommenders could further the editorial mission. In addition, the stronger the societal interest in well-informed citizens, the less responsiveness to the interests of users alone is considered a good thing, and the more recommenders could become an indispensable tool

for the media to alert, inform or even educate readers and push them out of their intellectual comfort zones. Alternatively, the more focus there is on individual freedoms and self-development, the more recommenders become a tool in the hands of the user, and should, first and foremost, offer the user agency with regard to her choices.

The analysis also has interesting implications for the role of users: theories that expect less active citizenship in political matters can still have high expectations regarding citizens' management of their own information diet, and recommendations can be an important tool in that. Self-selection recommenders are the preferred option in more liberal models, as opposed to more participatory or deliberative models where preselected recommenders offer more opportunities to present readers with information they "ought to read" (and where nudging them to read such information is actually a good thing). Where societal interest in well-informed, active and open-minded citizens is the dominant interest, individual interests such as privacy, autonomy and accuracy must be balanced against the opportunities that data and AI offer for better informing and even educating citizens. Algorithmic news recommendations in themselves are neither good nor bad for democracy. It is the way the media use the technology that creates threats, or opportunities.

Note

1. The author is indebted to one of the autonomous reviewers for making this point.

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References

- Anderson, Chris W. 2011. "Deliberative, Agonistic, and Algorithmic Audiences: Journalism's Vision of its Public in an Age of Audience Transparency." *International Journal of Communication* 5: 529–547.
- Balkin, Jack M. 2018. "Free Speech in the Algorithmic Society: Big Data, Private Governance, and New School Speech Regulation." *UC Davis Law Review* 51:1149–1210.

- Belair-Gagnon, Valerie, Holton, Averie E. 2018. "Boundary Work, Interloper Media, And Analytics in Newsrooms: An Analysis of the Roles of Web Analytics Companies in News Production." *Digital Journalism* 6 (4): 492–508.
- Boczkowski, Pablo J. 2013. *The News Gap: When the Information Preferences of the Media and the Public Diverge*, edited by Eugenia Mitchelstein and (Organization) JSTOR. Cambridge, MA: The MIT Press.
- Calo, R. 2014. "Digital Market Manipulation." *George Washington Law Review* 82 (4): 995–1051.
- Cherubini, F., Nielsen, R.K. 2016. *Editorial Analytics: How News Media are Developing and Using Audience Data and Metrics*. Oxford: Reuters Institute for the Study of Journalism.
- Christians, Clifford. 2009. *Normative Theories of the Media: Journalism in Democratic Societies*. Urbana, IL: University of Illinois Press.
- Curran, James. 2015. "Reinterpreting the Democratic Roles of the Media." *Brazilian Journalism Research* 10 (2): 28–53.
- Dahlberg, L. 2011. "Re-Constructing Digital Democracy: An Outline of Four 'Positions'." *New Media and Society* 13 (6): 855–872.
- Dahlgren, Peter. 2006. "Doing Citizenship." *European Journal of Cultural Studies* 9 (3): 267–286.
- Diakopoulos, Nicholas and Michael Koliska. 2017. "Algorithmic Transparency in the News Media." *Digital Journalism* 5 (7): 809–828.
- Ekstrand, M. D. and M. C. Willemsen. 2016. RecSys 2016. Proceedings of the 10th ACM Conference on Recommender Systems.
- Eskens, Sarah, Helberger, Natali, Moeller, Judith 2017. "Challenged by News Personalisation: Five Perspectives on the Right to Receive Information." *Journal of Media Law* 9 (2): 1–26.
- Etzioni, Amitai 1996. "The Responsive Community: A Communitarian Perspective Presidential Address, American Sociological Association." *American Sociological Review* 61 (1): 1–11.
- Edwin Baker, C. 1998. *Media Concentration and Democracy: Why Ownership Matters*. New York: Cambridge University Press.
- Ferree, Myra, Gamson, Wiliam, Jürgen, Gerhards, and Rucht, Dieter. 2002. "Four Models of the Public Sphere in Modern Democracies." *Theory and Society; Renewal and Critique in Social Theory* 31 (3): 289–324.
- Ferrer-Conill, Raul, Tandoc, Edison C. 2018. "The Audience-Oriented Editor: Making Sense of the Audience in the Newsroom." *Digital Journalism*, 21(6): 436–453.
- Garton Ash, Timothy. 2016. *Free Speech: Ten Principles for a Connected World*. New Haven, London: Yale University Press.
- Gibbons, Tom 1998. *Regulating the Media*. 2nd ed. London: Sweet & Maxwell.
- Gitlin, Todd. 1998. "Public Sphere or Public Sphericules?" In *Media, Ritual and Identity* edited by T. Liebes and J. Curran, 168–174. London: Routledge.
- Harambam, Jaron, Helberger, Natali & van Hoboken, Joris. 2018. "Democratizing algorithmic news recommenders: how to materialize voice in a technologically saturated media ecosystem". *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 376 (2133).
- Helberger, Natali, Karppinen, Kari and D'acunto, Lucia. 2018. "Exposure Diversity as a Design Principle for Recommender Systems." *Information, Communication & Society* 21 (2): 191–207.
- Held, David. 2006. *Models of Democracy*. Stanford: Stanford University Press.
- Karppinen, Kari. 2013a. *Rethinking Media Pluralism*. 1st ed. New York: NY: Fordham University Press.
- Karppinen, Kari. 2013b. "Uses of Democratic Theory in Media and Communication Studies." *Observatorio (OBS*)* 7: 1–17.
- Lewis, Seth and Usher, Nikkie. 2016. "Trading Zones, Boundary Objects, and the Pursuit of News Innovation: A Case Study of Journalists and Programmers" *Convergence: The International Journal of Research into New Media Technologies* 22 (5): 543–560.
- Li, Yaojun & Marsh, David. 2008. New Forms of Political Participation: Searching for Expert Citizens and Everyday Makers. *British Journal of Political Science* 38 (2): 247–272.
- Manin, Bernard. 1987. "On Legitimacy and Deliberation. Political Theory." *Political Theory* 15 (3): 338–368.

- Meiklejohn, Alexander. 1948. *Free Speech and its Relation to Self-Government*. New York: Harper and Brothers.
- Moore, Martin. 2016. *Tech Giants and Civic Power*. London: Centre for the study of Media, Communication & Power.
- Napoli, Philip. 1999. "The Marketplace of Ideas Metaphor In Communications Regulation". *Journal of Communication* 49 (4): 151–169.
- Napoli, Philip M. 2011. *Audience Evolution: New Technologies and the Transformation of Media Audiences*. New York: Columbia University Press.
- Helberger, Natali. 2011. "Diversity by Design." *Journal of Information Policy* 1: 441–469.
- Newman, Nic. 2018. *Journalism, Media, and Technology Trends and Predictions*. Oxford: Reuters Institute.
- OFCOM. 2012. *Measuring Media Plurality. Ofcom's Advice to the Secretary of State for Culture, Olympics, Media and Sport*. London: OFCOM.
- Pariser, Eli. 2011. *The Filter Bubble: What the Internet is Hiding from You*. New York: Penguin.
- Richards, Neil. 2008. "Intellectual Privacy." *Texas Law Review* 87(2): 387–445.
- Schoenbach, Klaus. 2007. 'The Own in the Foreign': Reliable Surprise – An Important Function of the Media?" *Media, Culture & Society* 29(2): 344–353.
- Spahn, Andreas. 2012. "And Lead Us (Not) into Persuasion...? Persuasive Technology and the Ethics of Communication." *Science and Engineering Ethics* 18 (4): 633–650.
- Strömbäck, Jesper. 2005. "In Search of a Standard: Four Models of Democracy and their Normative Implications for Journalism." *Journalism Studies* 6 (3): 331–345.
- Sunstein, Cass. 2001. *Republic.Com*. Princeton, NJ: Princeton University Press.
- Tandoc, Edson C. and Thomas, Ryan J. 2015. "The Ethics of Web Analytics: Implications of Using Audience Metrics in News Construction." *Digital Journalism* 3 (2): 1–16.
- Turow, Joseph. 2005. "Audience Construction Culture Production: Marketing Surveillance in the Digital Age". *Annals of the American Academy of Political and Social Science* 597 (1): 103–121.
- Thurman, Neil, Schifferes, Steve. 2012. "The Future of Personalisation at News Websites: Lessons from a longitudinal study." *Journalism Studies* 13 (5): 775–709.
- Thurman, Neil, Moeller, Judith, Helberger, Natali & Trilling, Damian. 2018. "My Friends, Editors, Algorithms, and I". *Digital Journalism*, online first.
- Wentzel, Dirk. 2002. *Medien Im Systemvergleich: Eine Ordnungsökonomische Analyse Des Deutschen Und Amerikanischen Fernsehmarktes*. Stuttgart: Lucius & Lucius.
- Young, Iris Manon. 1996. "Communication and the Other: Beyond Deliberative Democracy." In *Democracy and Difference. Contesting the Boundaries of the Political*, edited by Seyla Benhabib, 120–136. Princeton: Princeton University Press.
- Zaller, John. 2003. "A New Standard of News Quality: Burglar Alarms for the Monitorial Citizen." *Political Communication* 20 (2): 109–130.
- Zamith, Rodrigo. 2018. "Quantified Audiences in News Production: A Synthesis and Research Agenda." *Digital Journalism* 6 (4): 418–435.