Measuring Democracy in the Age of Digitalization.
Theoretical Issues, Methodological Concerns, and Exemplary Solutions

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Abstract

The increasing digitalization of democratic societies poses various challenges to the measurement of democracy. These challenges include theoretical and conceptual problems as well as the need to adapt currently used methodological approaches. Taking Merkel’s concept of embedded democracy as a point of departure, the paper analyzes the transformation(s) of democratic political systems caused by processes of digitalization, highlights prominent challenges caused by these developments for renowned measurement approaches and proposes exemplary solutions. In the concluding part, we offer general perspectives for future research on measuring democracy in the context of increasing digitalization.

1. Research Interest

Indices of democracy constitute a field of research that is increasingly plural in terms of theory, methodology and empirical approaches (Coppedge et al. 2017; Diamond 2016; Lauth 2013; Munck 2009; S. Pickel and Pickel 2016; S. Pickel, Stark, and Breustedt 2015). More recent approaches overcome the narrow focus on liberal-representative (or electoral) models of democracy that characterized older indices of democracy (Niemeyer, Curato, and Bächtiger 2015). The new approaches take into account the plurality of contemporary theories of democracy – among others, participatory (Dlabac and Schaub 2012) and deliberative ones (Coppedge et al. 2011) – as well as emerging empirical phenomena like democratic innovations (Geißel and Newton 2012) and deliberation (Coppedge et al. 2016). The most advanced indices acknowledge the state of the art of the current theoretical debate as well as real-word developments. In line with that, they are now facing the task to include the increasing digitalization and its effects on democracy in their frameworks.
What is meant by digitalization in the context of this paper? In a narrow sense of the word, “digitalization” refers to the transformation of analog data to digital data. In this paper, we adopt a much broader understanding of digitalization. We assume that recent technological developments in this field have spillover effects on multiple areas of society. The concept refers to a complex technological and social process that is characterized by the increasing significance of the “digital sphere”. According to our understanding, digitalization is not only a technological development, but also characterized by the following phenomena: (1) vastly increasing amounts of available digital data, (2) growing importance of digital networks, (3) interconnectivity (instead of separation!) of the analog and digital realm.¹

We argue that digitalization has severe impacts on democracy, which we call “digitalization effects”. Digitalization effects have to be taken into account when measuring democracy for two reasons: On the one hand, if democracy indices only measure “analog” indicators and fail to measure the increasing influence of digitalization on the analog sphere, they increasingly lose their validity. On the other hand, merely “analog indices” do not acknowledge genuinely new democratic phenomena originating from digitalization.²

Indices of Democracy have to include digitalization and its effects on the realm of the social and political sphere (Kneuer 2016). However, this attempt has not yet been made. The aim of this paper is to point out some of the theoretical and methodological challenges of integrating the effects of digitalization into democracy indices. Even though the paper shall illustrate the scope and importance of those changes from a theoretical point of view, our theoretical discussion will be grounded in recent empirical studies in this field. We will propose exemplary operationalizations for selected effects of digitalization. Pursuing this, we will finally propose some recommendations for

¹ Felix Stalder (2015) proposed the concept of “Digitalität” (the analog English art term would be “digitality”). This comprehensive concept is similar to the one suggested by us in its wide scope and complexity, but it is not established so far in the Anglo-Saxon debate. In addition to the fact that Stalder’s artificial term is not common for English-speaking people (and, not to mention: hardly translatable), we prefer the concept of digitalization as its grammatical form indicates a process rather than a steady state.

² In order to meet these challenges, they would have to, for example, broaden their participation indices by adding digital forms of participation and acknowledge the changing informational basis of the democratic process from offline media towards social media.
scholars who want to include effects of digitalization in their frameworks for measuring democracy.

This paper contains five sections. The following section will portray the current state of the art on digital democracy and its empirical measurement. The third section exemplifies our theoretical framework: Since democracy is not a monolithic block, the effects of digitalization vary between different spheres and levels of democracy. Therefore, we are in need of an analytical concept of democracy which is compatible with the plurality of existing indices of democracy. We thus use the concept of “embedded democracy” by Wolfgang Merkel (2004). Based on this concept, we will address three of his five regimes of democracy (the remaining two are irrelevant regarding the effects of digitalization) in the fourth section. We will use this framework to structure our mainly theoretical discussion of the digitalization-induced changes in democracy. Building on this analysis, we present some preliminary remarks on how existing measuring instruments can (or have to) be modified in order to maintain their validity in times of increasing digitalization. We will refer to the Democracy Barometer and Freedom House’s “Freedom in the World” index (FIW) to exemplify the “analog” measurement of those democratic phenomena, which are increasingly under stress due to processes of digitalization. Based on this discussion we will finally propose some meta-theoretical recommendations for the integration of digitalization into indices of democracy in the fifth section. We will close with some tentative reflections on the integration of big data (Canali 2016) and text mining as new means for collecting data for indices of democracy.

2. State of the Art

Though it is widely accepted that processes of increasing digitalization and digital networking influence democracy (Rödder 2015), the direction, intensity, time horizon, and normative evaluation of those developments are controversial among researchers. Since 1990, there has been an intense interdisciplinary discussion on e-democracy that focuses on the level of technological development of a political community and analyzes the systematic influence of the new information and communication technologies (ICT) on democracy (cf. Vedel 2006, 226). Päivärinta and Øystein (Päivärinta and Øystein n.d., 818) define e-democracy as follows: “[...] e-democracy refers to the use of
information and communication technology (ICT) in political debates and decision-making processes, complementing or contrasting traditional means of communication”.

Social theory often regards ICT as the initiator of a revolution – the digital turn (Berry 2011) – that will enable new forms of democracy, not only quantitatively but also qualitatively. They sketch strongly normative theoretical models of democracy that stress the progressive and emancipatory potential of the internet. In a first phase of debate in the 1990s, a primarily normative discourse has been conducted between defenders of utopian and dystopian positions (Barber 2001), debating the consequences of “the internet” for democracy (Nam 2017; Schaal 2015). One notion frequently expressed in this discourse was the idea of a “digital democracy” (cf. de Zúñiga et al. 2010; Hacker and Van Dijk 2000; Mossberger and Tolbert 2010; Van Dijk 2012), i.e. the idea of a political system whose democratic processes have been transmitted into the digital sphere to a considerable extent (skeptical Hindman 2009). This “two-model-debate” has by now been substituted by more differentiated discourses that regard the internet as a facet of a larger development, the latter being characterized by phrases such as “increasing digitalization in all spheres of society” and “digital networking” (Dahlberg 2011; Dijk and Hacker 2000; Kersting 2012). Purely normative studies have considerably lost their influence and empirical studies dominate the field today.

Empirical studies in the realm of digitalization are usually situated in an established academic discipline or field (cf. Kneuer 2016, 667). For example, numerous studies can be found in the field of political participation research, reflecting the influence of new possibilities of digital participation on citizens’ participatory behavior (Aichholzer and Strauß 2016; Gibson and Cantijoch 2015; Kersting 2016b), frequently taking a critical perspective on the digital divide (DiMaggio and Hargittai 2001; Min 2010; Vehovar et al. 2007). Some studies develop new forms of deliberative participation that shall improve the epistemic quality of decisions, going beyond face-to-face communication. Beth Simone Noveck’s (2009) concept of collaborative democracy has gained much attention in this field of research. Sociological studies have addressed social changes and the changing capacities for organizing political interests in a digital context (Earl and Kimport 2011). The communication sciences focused on the digital transformation of the public sphere (pars pro toto Dahlberg 2016; Gerhards and Schafer 2010) and
governance research came up with e-government as a new field of research (Nations 2016; Rodriguez-Bolívar 2014; Stier 2015). Very early on, legal scholars have investigated the consequences of digitalization for the law (Lessig 1999; 2006; Müller, Schaal, and Schaal 2004).

The scientific value of sectoral studies on consequences of digitalization shall not be questioned. However, what constitutes the exceptional quality of processes of digitalization is their impact on all spheres of society. In the case of digitalization, we are dealing with a phenomenon that is not restricted to a specific sector of society. Furthermore, the effects in different sectors, realms, spheres or regimes of democracy are – at least partially – intertwined. Therefore, the challenges posed by digitalization lie beyond the focus of sectoral analyses (Mainzer 2014; cf. Rödder 2015). Acknowledging these facts, Kneuer identifies a “considerable need for (...) a broader perspective in order to overcome the proliferation of isolated and eclectic findings” (Kneuer 2016, 667).

Indices of democracy combine theoretical reflections on democracy and empirical analyses. Therefore, this field of research is destined to be at the forefront of comprehensive digitalization studies. However, this has not been done yet. Kneuer perceives “digital media” as the central influence on democratic processes, and consequently states: “(T)here is no index for measuring the democratizing influence of digital media. ‘Traditional’ democracy indices do not include digital media at all or only consider very basic aspects (such as Internet freedom) (...)” (Kneuer 2016, 668). Since Kneuer’s publication, a few studies have been published that include digital media in a comparative perspective (Nam 2017) or design e-democracy indices (Navarro 2007). But a full-scale index of democracy that includes analog and digital dimensions, as well as their interplay is still a desideratum.

3. The Analytical Concept: Embedded Democracy

The concept of “embedded democracy” will be used as a framework for examining the effects of digitalization on democracy and their empirical manifestations. Since democracy is multidimensional, we need an abstract, generally accepted analytical concept. Those claims are answered in the concept of “embedded democracy” by Wolfgang Merkel (2004). Referring to his differentiation of democracy into dimensions
and partial regimes we will discuss the effects of digitalization on democracy for three of those regimes in the fourth section.

Merkel (2004) distinguishes three dimensions, five partial regimes and ten criteria of democracy. The structure is specified in table 1:

I. Dimension of vertical legitimacy

A. Electoral regime
   (1) Elected officials
   (2) Inclusive suffrage
   (3) Right to candidacy
   (4) Correctly organized, free and fair elections

B. Political rights
   (5) Press freedom
   (6) Freedom of association

II. Dimension of liberal constitutionalism and rule of law

C. Civil rights
   (7) Individual liberties from violations of own rights by state/private agents
   (8) Equality before the law

D. Horizontal accountability
   (9) Horizontal separation of powers

III. Dimension of effective agenda control

E. Effective power to rule
   (10) Elected officials with the effective right to rule

Table 1: Dimensions, partial regimes and criteria of embedded democracy (with Merkel 2004, 42)

Regime A, the “electoral regime” is crucial for democracy. Its function is the filling of positions of power by way of free and competitive elections. Regime B, “political rights”, is to be understood as a precondition for regime A. In this regime, the “collective formulation of opinions and demands” takes place, which “determines and supports competition over positions of power” (Merkel 2004, 38). Political participation rights and the public sphere (including the media) therefore constitute this regime. The “civil rights” regime C comprises the negative rights of defense that protect the individual against the tyranny of the majority, as well as the principle of the rule of law. Regime D, “horizontal accountability”, addresses the division of power, balance and control of political power. Regime E is concerned with the “effective power to rule”. The regimes are mutually embedded and support each other. Furthermore, they are embedded in their socio-economic context and the civil society (Merkel 2004, 44).
4. Effects of Digitalization in Three Partial Regimes of Democracy

In this section, we will discuss the effects of digitalization in three selected regimes: the electoral regime, the political regime, and the civil rights regime. The relative weight of the discussions of the partial regimes in our paper corresponds with the anticipated or already existent effects of digitalization. In order to illustrate connections between our line of argument and established indices of democracy, we will start the discussion of each regime by naming indicators and operationalizations used by the Democracy Barometer and Freedom House’s “Freedom in the World” index (FIW) to measure the respective regime. At the end of each section, we will assess the validity of the named indicators and indices in the context of democracies’ transformations induced by digitalization. We will conclude each section by outlining possible amendments or supplements. Since the concept of embedded democracy has never been congruently used for a democracy measure, there will be a mismatch between the position of the indicators within the indices and the position within the concept of embedded democracy in some cases.

4.1. The Electoral Regime

4.1.1. Operationalization of the electoral regime

In the Democracy Barometer (Merkel et al., 2016), the electoral regime is measured in different contexts. The measure elicits not only the competitiveness and openness of elections (COMPET), but also the equality concerning electoral participation (PAR_EQPA) and the representativeness of the elected body (REPRES). However, items or indices measuring the correct organization, freedom, or fairness of the elections, are not part of the measure.

Freedom House’s FIW index (Freedom House, 2017b), on the other hand, very thoroughly investigates the correctness of the election procedures for various levels of government (question block A). The measure elicits information about the presence of election monitoring organizations, undue and politically motivated delays of elections, the registration of candidates, the secrecy of the voting procedure, undue pressure on

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3 We focus on these three regimes, since the remaining two are affected by digitalization to a far lesser degree.
the voters, transparency of the vote count, as well as the equal weighting of the votes. Additionally, the index investigates the competitiveness of elections (B.1-2) and the equality concerning electoral participation (B.4), quite similarly to the Democracy Barometer.

The differences between the Democracy Barometer and the FIW index are mainly due to different methodological approaches. While the FIW relies on the evaluations of external analysts (Freedom House, 2017a) the authors of the Democracy Barometer base their measurements on ‘hard data’ that are generally accessible (Merkel et al., 2016, p. 8).

Within the electoral regime, the criteria “elected officials”, “inclusive suffrage” and “right to candidacy” are not influenced by processes of digitalization. Challenges arise, however, for the criterion of “correctly organized, free and fair elections”, especially with regard to elections using voting machines (for an overview see Alvarez and Hall 2008): Firstly, voting machines, like all computers, are subject to technical ageing processes, faulty coding, etc. A sophisticated study analyzing the use of voting machines in the USA was presented by Norden and Famighetti (2015). Their venture point was a warning by the “Presidential Commission on Election Administration” (PCEA) in 2014 stating an “impending crisis ... from the widespread wearing out of voting machines purchased a decade ago” (quoted by Norden and Famighetti 2015, 4). Those worn-out voting machines were used in 43 states of the US at the time of the warning. Technical and/or system errors of those machines had already lead to the loss of votes: In the year 2008, it became known that voting machines by the company Premier Election Solutions ‘forgot’ part of the votes when aggregating the results of various voting machines (Gerling 2017, 12; translation by the authors). Thus, the central criterion of political equality (one person, one vote) was violated, and with it the central foundation of democratic legitimation. Lost votes because of aged voting machines produce unintentional and random errors, and do not distort the results of elections systematically.\(^4\)

\(^4\) Faulty programming on the other hand may well lead to systematic errors, since a voting machine would produce the same (faulty) result every time the program is executed.
Secondly, and more important for the integrity and legitimacy of elections, voting machines can be intentionally manipulated. The study by Norden and Famighetti finds that 2014 in the US State West Virginia 24% of the voting stations used voting machines which an “external party could access the machine's wireless features to ‘record voting data or inject malicious data’” (Norden and Famighetti 2015, 5). Similarly, security expert Jeremy Epstein (2015) showed how easy the access to a commonly used voting machine in the US – the AVS WinVote touchscreen Direct Recording Electronic (DRE) voting machine – actually is: The machines run either a Windows XP embedded laptop or a Windows 2000, both of which have not been patched since 2004. Because of its signal strength, the Wi-Fi of the machine can be accessed even from outside the voting booth – Epstein names a 300 ft distance. The WEP encryption code of the network was set to “abcde”, the default user name “admin” – and the WEP code could not be changed. Epstein concludes, that “(i)f an election was held using the AVS WinVote, and it wasn’t hacked, it was only because no one tried. The vulnerabilities were so severe, and so trivial to exploit, that anyone with even a modicum of training could have succeeded.” (Epstein 2015 p. o.S.).

Most unsettling seems the fact, moreover, that manipulations of voting machines are hard to detect, which places the integrity of elections under reservation, and thus, poses a general threat to the legitimacy by elections. That does not only apply to outdated voting machines, as the European association “Chaos Computer Club” demonstrated several times. In view of the security of the digital infrastructure of elections, Epstein states: “(W)e don’t know how to measure much of anything in security”, but “calling any system ‘unhackable’ is just ridiculous” (Epstein:2015b). Great hopes rest on the improvements of cryptographic procedures (Fischer 2016), especially on the use of blockchains (Witte 2016).

4.1.2. Recommendations concerning the „electoral regime”

Securing fair elections by correct procedures is a central source of legitimation for democracies. The use of voting machines already causes violations of the fairness

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7 https://berlin.ccc.de/wiki/Wahlcomputer
principle, both intentional (manipulation and hackers) and unintentional (faults caused by outdated technology). The measurement of integrity and fairness of elections therefore has to consider the use of voting machines. Since currently analog and digital voting procedures are used simultaneously in most democracies, the integrity and fairness of elections has to be measured on both dimensions separately.

The possibilities of operationalization are numerous. They stretch from the ratio of votes cast via analog and digital means, or the ratio of voting machines beyond a certain age, to the assessment of the voting machines’ security against manipulation. Manipulations from afar – mainly attacks on the networks – have to be included in the measurement as well. Every digital infrastructure is vulnerable; their ‘hackability’ can by pre-assessed by interviewing IT security experts or systematically mining respective security blogs.

4.2. The Political Rights Regime

4.2.1. Operationalization of the Political Rights Regime

The democracy barometer subsumes the constitutional provisions for the freedom of the press under the index measuring the freedom of opinion (PS_FROP1). Furthermore, the ideological balance of the press and the share of neutral and independent newspapers’ circulation are elicited as proxies for the political neutrality of the press (PS_FROP3). The index also measures the “media offer” (share of imported newspapers in the GDP, and ratio of circulated newspaper per citizen; PS_FROP2), but again only including print media. Regarding the freedom of association, the index examines the constitutional provisions guaranteeing freedom to associate (PS_FRAS1), and the membership numbers in trade unions and other professional organizations (PS_FRAS2), as well as humanitarian and environmental organizations (PS_FRAS3). (Merkel et al., 2016)

The freedom in the World index on the other hand analyses freedom of the press (and other forms of cultural expression) with regard to – among others - censorship of print, broadcast, and internet-based media, self-censorship of journalists, political punishment of journalists, and governmental influence on the media and press in terms of financial dependency (D.1). The freedom of association covers a whole block of questions (E).
The first part investigates the practical aspects of political assemblies (restrictions, requirements to obtain permission, detention and assault of participants). The second part addresses the freedom of nongovernmental organizations (registration practices, laws concerning financing, government pressure on donors and members). The third part analyses trade unions, their freedom from governmental interference, and their ability to strike and bargain collectively. (Freedom House, 2017b)

Merkel defines two criteria for the political rights regime: press freedom and freedom of association. We will first investigate the effects of digitalization on those criteria.

4.2.2. Impact of Digitalization on Different Criteria of the Political Rights Regime

4.2.2.1. The Criterion of “Press Freedom”

Digitalization, and especially the emergence of social media, changed the structure of the democratic public sphere (Iosifidis and Wheeler 2016). During the last years, social media (such as Facebook, Twitter and other blogs) transformed the formerly dominant one-to-many or few-to-many communication into many-to-many-communication. With this levelling of communication came the diversification of sources of political information: Social media gained massive influence, and the classical quality journalism shifted its weight from print editions to online editions. Consequently, the normative meaning of the fundamental right to press freedom remains intact, while its scope has to be stretched to include the above-mentioned digital sources of information. This includes not only the contents dimension of internet publishing, but also the technical dimension of unhindered access to all contents on the net – nationally as well as internationally.

The methodological issues of how to measure press freedom in the age of digitalization are serious. Even more pressing are normative issues: In pre-digital times, freedom of the press served the function of securing the informational basis of a free and enlightened democratic processes. However, we doubt that this function (in Robert Dahl´s sense) can still be adequately fulfilled in the age of digitalization, let alone be measured by the currently existing indices designed to measure the extent of press freedom. We will exemplify this argument with reference to newspapers.
Newspapers are prime victims of digitalization, since the two main ways to finance print media (advertisements and subscriptions) are no longer sufficient in the age of digitalization. Many printed newspapers have died during the last years. And many of the remaining ones are owned by a few global players like the Murdoch Group. Both trends diminish the pluralism of available newspapers in print. To counterbalance these developments, great hopes lie upon citizen journalism. Nonetheless, recent studies state their skepticism regarding exaggerated expectations towards citizen journalism. For example, Peters and Witschge (2014) come to the conclusion that citizen journalism cannot substitute, or even complement, quality journalism.

Printed newspapers are in serious trouble. And any index of democracy that relies on printed newspapers only will arrive at troubling conclusions regarding press freedom, understood as the informational basis of an enlightened democratic process. But things may change, if online newspapers are taken into account. And things change (and new problems emerge), if alternative, web-based sources of information are considered.

4.2.2.2. The Criterion of “Freedom of Association”

The organization of political interests is a central theme of democratic theory and political sciences. Especially older theories of democratic pluralism are based on the assumption that all political interests within a society can be organized. More recent electoral models of democracy rely on this pluralist assumption. Most indices of democracy merely study analog forms of organization of political interests. Typically, they count the number of legally organized, long-term organizations and the number of their members.

However, digitalization radically changed the organizational procedures and organizational possibilities of social and political interests (Earl and Kimport 2011; Margetts et al. 2015). The focus on legally organized, long-term organizations increasingly misses the core of a digitally organized society. Some interest groups exist solely within the digital sphere and some use merely digital means to organize the

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8 McChesney (2013) even argues that the concentration processes tend to monopolize the market and that the monopolists will stand against democracy.

9 For example, the Social Capital approach uses the organizational level of the civil society in combination with the level of generalized trust of the individuals as independent variables for the measurement of the democratic quality of a democracy. Likewise, republicanism in the tradition of Tocqueville attributes great democratic relevance to the quality of social networks.

10 There are critical democratic theories that see different logics of organization at work in capitalist societies (e.g. the interests of shareholders and of employees). They interpret them critically in terms of power.
interests of their members in the ‘real world’. One-issue movements with a short life span have already widely spread in the analog world, and this trend is now radically intensified in the digital realm. Interest groups using the internet tend toward a less hierarchical and more informal, network-like organizational structure. The democratic process of liberal democracies is based on the formation and uptake of collectively organized interests. If the organizational structure of interest intermediation changes, the democratic process has to adapt to those changes to remain responsive to web-based articulations of collective interests. These newly establishing procedures will be experimental – at least for a transitional period –, so they will not be legally codified. Therefore, indices of democracy will have to empirically reconstruct those new procedures and mechanisms in order to obtain a proper picture of the organizational status of a democratic community.

4.2.3. Normative Gaps of the Political Rights Regime

Freedom of press and freedom of organization do not capture the entire normative meaning of “political rights”. There is a gap that is best explained along the lines of the differentiation between “politics” and “the political” (Bröckling and Feustel 2015; Marchart 2007; 2013; Mouffe 2011). According to David Easton, “politics” is the authoritative allocation of values for a society. “The political” describes a sphere of communication within civil society, within which the citizens discuss, what (pre-political) matters should be subject to collectively binding decisions (politics). The discourses in the political sphere primarily aim at convincing the fellow citizens, they do not intend to directly influence political decision makers. “Politics” and “the political” are intertwined and both should be addressed by indices of democracy. In the following, we will discuss those effects of digitalization that affect the sphere of “the political” within Merkel's political rights regime and that are not yet addressed by the two criteria described above.

4.2.4. Diversification of participation through online participation

The most obvious change within the sphere of “the political” is the diversification of participation possibilities because of the constant development of new possibilities of online participation (Kersting 2014; 2016a). Those possibilities include online debates, the participation in national and international online petitions (partially legally
binding), flash mobs, as well as the ‘liking’ of political messages on social media platforms. They can either complement or substitute analog modes of participation (Aichholzer and Strauß 2016; Ritzi and Wagner 2016). In any case, they increase the number of political participation forms that are not legally codified.

In the context of measuring democracy, it has to be decided which of these formats can be regarded as political participation in the classical sense of the concept (meaning all actions aiming at political authorities to influence collectively binding decisions). There is an intense debate on this topic, and many of the new forms of participation are being criticized as mere “slacktivism” (Christensen 2011; Glenn 2015; Lee and Hsieh 2013; Morozov 2011; Rotman et al. 2011)\(^\text{11}\), as opposed to actual participation.

The responsiveness of a democratic political system depends on the number and quality of its input channels. But there is no way of theoretically predicting whether the responsiveness will increase because of the above-discussed quantitative expansion of the modes of participation. For there are two possible effects: On the one hand, there could be a general increase of responsiveness because of the sheer quantity of new participation channels. On the other hand, there could be a general reduction of responsiveness because of ‘input complexity overload’. Furthermore, formerly inactive citizens could be activated if political freedom and political equality correlate positively. Alternatively, there could be an only partial increase of responsiveness to the preferences of the socio-economically privileged (thus continuing the trend of socially misbalanced participation in the analog sphere), if political freedom and political equality correlate negatively.

4.2.5. Fragmentation of the democratic public sphere and “Divided Democracy”

One consequence of the increasing importance of social media is the pluralization, if not fragmentation of the public sphere: In the age of digitalization, the only reasonable and meaningful way to talk about “the public sphere” is in the plural (Bruce and Peltu 1999; Kreide 2015; Webster and Ksiazek 2012). From the perspective of democratic theory, the evaluation of this fragmentation is controversial. But still, the majority of

\(^{11}\) “The concept generally refers to activities that are easily performed, but they are considered more effective in making the participants feel good about themselves than to achieve the stated political goals (Morozov, 2009).” (Christensen 2011 p.o.S.)
researchers come to the conclusion that digital communication generates “echo chambers” and “filter bubbles” (Abisheva, Garcia, and Schweitzer 2016; Gottron and Schwagereit 2016; Pariser 2011).

The effects of filter bubbles have been analyzed by Cass Sunstein (Sunstein 2003; Sunstein and Hastie 2008) for the analog sphere. Sunstein’s “Law of Group Polarization” states that even high-quality deliberation can lead to a radicalization of pre-deliberative positions if it takes place in homogenous groups. This is why successful deliberation depends on the heterogeneity of the participants’ attitudes towards the topic of deliberation. In the context of these theoretical considerations and with respect to empirical findings, a debate on the possibility of high-quality deliberation in fragmentized societies has emerged. One major point of the debate is to question deliberative consensus among the participants as the normatively preferred result of discourses (Dahlberg 2016).

According to Sunstein (2017), an even bigger challenge results from the societal tendency of homogenous group deliberation in conjunction with filter mechanisms used by content providers. These developments lead to a “divided democracy”, sapping the epistemic and informational foundation of democratic processes and systems (ibid.: 71):

“Social media make it easier for people to surround themselves (virtually) with the opinions of like-minded others and insulate themselves from competing views. For this reason alone, they are breeding ground for polarization, and potentially dangerous for both democracy and social peace.”

According to Sunstein, democracy essentially requires shared experiences, a shared language and a common understanding of the outside world, even if this reference to reality and its evaluation may be a matter of dispute. Filter mechanisms used by content providers and the fragmentation of the public sphere put liberal democracies in danger (cf. for a theoretical modelling of these factors’ interaction Mahnke 2015). Sunstein argues for an “architecture of serendipity” to counter these threatening developments resulting particularly from citizens’ growing incapacity to expose themselves to “competing perspectives” (Sunstein 2017: ix) and shift perspectives.
4.2.6. Recommendations regarding „political rights“

The freedom of the press is a fundamental right fulfilling an important function for democratic political systems: A free press is a precondition for high-quality democratic procedures as it provides the informational basis for democratic preference formation and control of political power.

In pre-digital times, it was sufficient for indices of democracy to refer to statutory constitutional law and to empirically measure the scope and range of print media. In the age of digitalization, this approach is hardly conclusive: Just by evaluating statutory law, the functions of a free press can no longer be assessed. Accordingly, for a valid measurement rules in use instead of rules in law have to be taken into account.

But due to the fundamental changes induced by digitalization, the measurement of these rules in use has to be adapted as well. Researchers have to identify the digital equivalents of the analog criteria that were used to measure freedom the press in pre-digital times. Examples for “new phenomena” to be included in measurement approaches are blog entries, Facebook posts or Tweets.

Interest aggregation and the organization of social and political interests increasingly take place in the digital sphere. Any measurement approach taking into account merely the interest formation and intermediation occurring in the analog sphere is no longer able to get a grip on the full extent of a society’s social and political organization. Beyond that, they might misjudge the implications of this transformation as digital interest intermediation changes the formal structure of organizations as well as the mediation processes between civil society and the political system. In addition, the portfolio of forms of political participation broadened by processes of digitalization. An analysis of the level of citizens’ actual participation and political equality therefore has to take into account participation taking place offline and online.

Finally, measures of democracy evaluating the quality of the public sphere have to take into account the fragmentation of the digital public sphere. This is crucial especially for indices measuring deliberation. Indices of democracy taking (post-discursive) consensus as a proxy for deliberative quality have to critically reconsider its explanatory power for the evaluation of the digital public sphere.
4.3. The “Liberal Constitutionalism” Dimension and the “Civil Rights” Regime

“Individual liberties from violations of own rights by state/private agents” is one criterion of the dimension of liberal constitutionalism. In the subsequent part of this paper, we take a broad understanding of this criterion as a basis and discuss the whole phenomenon of “liberal constitutionalism” as liberal constitutionalism at large has to cope with immense adjustment pressure of adjustment stemming from processes of digitalization. This pressure to adapt affects the constitution and its basic normative ideas. If the core principles and values laid down in the constitution have to be adapted, the (normative) substance of the respective democracy is affected. In the context of this diagnosis, we want to outline the effects of digitalization for basic constitutional values in an exemplary manner.

4.3.1. Operationalization of “Liberal Constitutionalism” and “Civil Rights“

The individual liberties (criterion 7) as conceptualized by the Democracy Barometer include the right to physical integrity (constitutional provisions, actual transgressions by the state, mutual acceptance of the right to physical integrity by citizens) on the one hand (IL_PHIN), and the right to free conduct of life (constitutional provisions, actual freedom of conduct of life, effective property rights) on the other (IL_SELFU). The equality before the law (criterion 8) is subsumed under the index “Rule of Law”, and covers the constitutional provisions for impartial courts, the effective independence of the judiciary, and the effective impartiality of the legal system (RL_EQL).

The FIW index addresses the civil liberties in terms of the freedom to travel, and choice of residence, employment, or educational institutions, the right to own property and establish private business, the personal social freedoms concerning marriage and partners, as well as the equality of opportunity and the absence of economic exploitation (G.1-4). The equality before the law is included in the index concerning the rule of law (E.4). Meanwhile, the FIW index does not cover the horizontal separation of powers.

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12 Criterion number 9, the horizontal separation of powers, is addressed with regard to the checks between executive and legislative powers, and their actual balance, as well as the judicial review of executive and legislative decisions (MC_CHECKS).
4.3.2. Impact of Digitalization on Criteria Associated with the Civil Rights Regime

4.3.2.1. Private Property

Private property is one of the core values protected by a liberal constitution. Due to processes of digitalization, the idea of private property is put under pressure: On the one hand, Commons and Copyleft Movements are questioning the very idea of intellectual property (Biagioli, Jaszi, and Woodmansee 2011; Ess 2013; Lenk and Hoppe 2016). On the other hand, rights of use and proprietary rights do not necessarily go hand in hand anymore (cf. Lessig 2006). But the basic idea of classical liberalism is that private property and use of private property fall into one.

As digitalization implies that “property” does not necessarily designate a material object anymore – movies, music, books, software, etc. do not need a material carrier medium (such as CDs, DVDs, etc.) –, the very concept of property outlined above becomes problematic: Property rights do not imply full rights of use anymore. Rather, the rules of use are defined by the software (the code) itself – “Code is Law” (Lessig 2006). In Germany, a debate on “Digital Rights Management” emerged in the context of these developments. In consequence, the idea of private property as laid out in the constitution changes remarkably.

These processes change positive law as well. One instructive example is Germany’s “right to a private copy” that was passed by the Bundestag in July 2007 by way of a reform of the copyright bill. The bill legitimizes a copy for private purposes as long as a circumvention of copy protection is not necessary. Thus, property rights do not automatically imply unconstrained rights of use any longer. In 2013, the Baden-Württemberg Ministry for Rural Affairs and Consumer Protection and the Federation of German Consumer Organisations published a position paper called “Copy Right 2.0 – What about the Consumers?”. It criticizes the effective repeal of basic rights by private law: “The possibility to create a private copy is to be translated into law as an indispensable, fully-fledged user right. It should be an essential basic idea of copyright that users can make a copy for personal use. This right should not be

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restricted, avoided or prevented in the future through the use of technical copy protection measures or terms and conditions.” (Baden-WürttembergVerbraucherzentrale 2013: 2)

4.3.2.2. Monitoring and Security

The central purpose of liberal rights is to constitute a sphere free from interferences of the state. The basic liberal right to privacy is paradigmatic. These core values and rights are challenged by digitalization processes. These processes have been discussed intensively – especially in the wake of the “Snowden Leaks”, so we merely want to recall two main facets in this paper.

First, we want to recall the importance of the discourse on the value and the enforceability of privacy in the age of digitalization. Whenever we engage in activities in the digital sphere, we leave “traces”, a myriad of digital data that would – if put into the right context and connected adequately – allow far-reaching and differentiated assessments about a user and his behavior. As a result, a branch of research called “Critical Internet Surveillance Studies” emerged (Fuchs et al. 2013). Though there are some researchers (and politicians) who insist on the necessity to save the private sphere from becoming obsolete by digitalization, others claim that the underlying principle itself has become undefendable – mostly due to technical, not normative reasons (Bernal 2014; Buchmann 2013; Pollicino and Romeo 2016; Ritter 2009).

Second, surveillance opportunities for intelligence services have dramatically increased. How intensely the NSA monitored the citizens of its own country became public through the “leakings” of Edward Snowden. The quantity and quality of citizens’ surveillance by the state, which essentially means a disregard of fundamental liberal rights – was only possible due to the technological developments depicted above and by the use of Big Data.

\[14\] For a comparative analysis from a normative and empirical perspective see (Mendel:2012ut),
4.3.2.3. Control and Limitation of Power: The Case of Algorithmic Power

Constitutionalism essentially means the control and limitation of power. But the character of power changes through digitalization. So far, power was conceptualized either as personal or as structural power (Lukes 2002; cf. canonical: 2005). This understanding now has to be supplemented by another category: algorithmic power (Ausiello and Petreschi 2013; Kitchin 2016; Mahnke 2015; Mahnke and Uprichard n.d.).

Algorithmic power poses multiple problems for democratic political systems and the way they function. Five outstanding aspects shall be outlined here:

1. Lack of transparency of algorithmic power: Algorithmic power could only be transparent if the respective code would be public. But the codes that are of outstanding importance and have great impact on the quality of the (political) public sphere are often central to the economic success of companies and will therefore hardly be published. A good example for an algorithm which exercises intransparent power is Google’s page rank algorithm. Power (in form of agency) can in this case be ascribed to the programmers and the companies using the algorithms.

2. The Agency Dimension of algorithmic power: The problem depicted under (1.) aggravates if the algorithms in question are self-learning algorithms. If this is the case, the algorithms are over time not even transparent for the programmers who have created them. Accordingly, the Agency Dimension of power diminishes.

3. The illusion of neutrality and objectivity of algorithms: Even though written in mathematical/logical language, most algorithms are representing theoretical considerations or are at least based upon theoretical considerations. There is a debate about the possibility of pure descriptive theories in the field of legal positivism. Leaving this debate aside, it is safe to say that most theories are not neutral, since they imply value decisions. And there is no scenario in which

\footnote{Alternativ findet sich im Rekurs auf Arendt die Differenzierung in transitive und intransitive Macht, die im Kontext unserer Überlegungen jedoch nicht anschlussfähig ist.}
values are neutral. So the implicit theoretical premises mirrored in the mathematical language of the code have to be uncovered: Otherwise, a mismatch of the (core) values of a society, institution or organization and the implemented and used (core) values of the algorithms may occur (cf. O’Neil 2016). In order to discern those implicit values, we need hermeneutics especially for algorithms (Mans 1999).

4. The invisibility of algorithmic power: It is perfectly possible for algorithmic power not to become visible at all. Most notably in the case of the use of algorithms in politics and political decision making, it is necessary to make their use public. Otherwise, citizens do not know if they are subjected to algorithmic power.

5. Algorithms are complicating the effective control of power: Political power is subjected to control and limitation in liberal democracies. An important parameter is the public justification of political decisions. In liberal democracies, justifications mostly take place in parliamentary debates in a process of taking and giving (good) reasons. The challenges for future policy-making resulting from digitalization might only be manageable by using Big Data. For liberal constitutionalism, this poses the following question: How can power in democracies be effectively controlled, if decisions are based on intransparent algorithms and algorithmic power? The computer scientist Diakopoulos (Diakopoulos and Deussen 2017, 362) emphasizes that it is time to think about how algorithms can be held responsible in a parliamentary context. From a political scientist’s point of view, this question is rather naïve. How can politicians be held responsible for algorithm-based actions which they themselves might not even fully comprehend? Who shall be held accountable for the (value) decisions algorithms themselves are based upon? These issues are central from a political science perspective.

4.3.2.4. Control and limitation of power: The Circumvention of Mass Media

In liberal constitutionalist societies, the public sphere controls and limits power. As we argued above, processes of digitalization induce a fragmentation of the public sphere.
A fragmented public sphere’s capacity to control power is decreased for reasons that are associated mainly with the increasing importance of Social Media: Due to Social Media, the amount and diversity of available information is much larger than in pre-digital times. From the perspective of democratic theory, this transformation of the media landscape is ambivalent: Unmediated communication between politicians and government officials and citizens has the potential to have a positive impact on democracy and democratic quality as the information is not filtered by mass media. But even though this aspect could make the information and the public discourse less selective, at the same time the control function of the media and their capacity to warrant the rationality of public discourses is reduced.

4.3.2.5. Circumvention of the Control of Power: The Case of Twitterbots

Empirical research was able to show that in the case of the US-American primaries 30% of all tweets concerning the election were sent by Twitterbots (Persily 2017). For the individual reader of a Tweet, it is hardly possible to decide if it was sent by a bot or by a “real” person. This makes it possible to manipulate democratic discourses via Social Media in various ways. This affects agenda setting (Twitterbots are able to open discourses) as well as relevance perception of a topic (by simply increasing the quantity of tweets for a certain issue) and the intentional “propaganda” for a specific substantial position. From this perspective, the normative integrity of public discourses in Social Media has to be questioned.

This situation poses serious problems for the function of public discourses from the perspective of deliberative democratic theory and liberal theories alike: From a liberal perspective, discourses in Social Media cannot ensure the validity of exogenous preferences (Del Vicario et al. 2016); from a deliberative perspective Twitterbots as “discourse participants” undermine a central normative idea, since they will not react to “better arguments” in the way reasonable citizens do – by changing their preferences. This means that the epistemic function of deliberation is undermined technologically.

According to Habermas (Habermas 1996), citizens’ autonomy is realized by deliberation and providing “good reasons” for reasonable positions that are in the common interest. This way of realizing autonomy and controlling institutionalized
politics as well as “powerful” politicians is impeded if public discourses and their epistemic function are undermined by Twitterbots. To an individual citizen it is impossible to decide if discourses are manipulated by Twitterbots. Distortions of discourses can only be diagnosed on a higher level of aggregation.16

4.3.3. Recommendations for “civil liberties” and “liberal constitutionalism”

Digitalization enables private and official (political) actors to collect and analyze unimaginable amounts of citizens’ data. The instrumental purpose of liberal rights was to create an inviolable sphere for each individual protecting her from the interference of (potentially overwhelmingly powerful) political actors. The developments outlined above endanger this central instrumental purpose.

The empirical value of liberal rights guaranteed by the constitution can only validly be measured if rules in use (and not rules in law) are measured. In order to measure the violations of basic liberal rights induced by processes of digitalization, insights of the “Critical Internet Surveillance Studies” may serve as a point of departure.

Regarding the control of political power, digitalization has led to fundamental changes as a new form of power has emerged, which is a hybrid of personalized and structural power: algorithmic power. This new form of power poses serious changes and challenges that democracies have to face: Do political representatives have to justify decisions made by algorithms? How are citizens to evaluate the content of political decisions, if the decision is based on algorithms? Who is responsible for the output/outcome of algorithmically based decisions?

These issues will be a matter for future research from a theoretical and an empirical perspective alike. Our recommendations are therefore rather limited and preliminary. First, indices of democracy should measure if political decisions are based on algorithmic processing of (big) data. Second, they should measure whether the use of algorithms is made transparent. Third, they should measure if the code of the algorithms is made public. Alternatively, they could measure if the reasons for using a specific algorithm was made public and/or object of a political debate. Finally, the

16 Big Data is used extensively – prominently in the USA’s recent presidential elections. Nevertheless, it is controversial how much impact the application has for electoral success. For an overview on this heavily disputed matter see https://www.nytimes.com/2017/03/06/us/politics/cambridge-analytica.html?referer=https://t.co/7VjOulz9Q5&_r=0 as well as http://www.zeit.de/digital/internet/2017-03/us-wahl-cambridge-analytica-donald-trump-widerspruch
question of accountability should be addressed: who is held accountable for decisions made on algorithmic grounds?

5. Concluding recommendations for the development of indices of democracy

5.1. An Outline of the Basic Conceptual and Theoretical Problem Posed by Digitalization

In this part of our paper, we will develop recommendations for the development of indices of democracy that take the effects of processes of digitalization into account. Even though our suggestions are based on and summarize the discussion in chapter 4, they are positioned on a higher level of abstraction and aim at providing more general guidelines for future measurement approaches of democracy in times of digitalization.

The analytical framework used by most indices of democracy is the one developed by Munck/Verkuilen (2002)\(^ {17} \), who demand a solid theoretical foundation. This demand renders theories of e-democracy and digital democracy pro tempore inappropriate, since they have not yet reached the level of theoretical reflection and corresponding institutional specification that is achieved by the renowned approaches in the field (liberal, participatory, republican, deliberative theories) (cf. Schaal 2015). Nevertheless, these canonical theories of democracy have only partially reacted to the fundamental theoretical challenges posed by processes of digitalization. The core values of liberal constitutionalism (property, freedom of speech and opinion, freedom of religion, physical integrity, private sphere) have already been formulated in the 17\(^ {th} \) and 18\(^ {th} \) century. They seem to be in need of an “update” in order to correspond with societies’ level of digital modernity.

In Karl R. Popper’s understanding, theories are webs enabling us to capture the relevant aspects of “reality” (Popper:2013f). But as we showed in this paper, analog democratic theories are no longer able to provide us with adequate webs to capture the spheres, processes, and aspects relevant for democracy and democratic performance in the context of an increasingly digitalized society.

\(^{17}\) Cf. Pickel et al. (Pickel, Stark, and Breustedt 2015) for a recent development of the framework.
The “analog” blind spots of renowned democratic theories are known: Republican theories are under-specified when it comes to institutional theory, liberalism focuses too much on institutions and disrespects the significance of individuals’ virtues, deliberative theories formulate ideals that are extremely demanding and can hardly be realized in practical politics. This is why in the case of these blind spots we can speak of known unknowns in the analog realm. Due to processes of digitalization, contemporary democratic theories formulated for the analog dimension of democracy produce unknown unknowns. This means that by applying specific theories of democracy, we a) are not able to identify what new problems are resulting from processes of digitalization and b) we do not know how to compensate for the respective blind spot.

This blindness becomes the more virulent, the more innovative the respective digitalization effect is. The fields and spheres of democracy that are merely complemented by digital developments will be identified more easily (and probably: earlier) than the fields in which groundbreaking innovations are taking place. As scholars of democracy, we are in urgent need of a theory or an approach which will help us to systematically identify those genuine new challenges.

5.2. Proposed Solutions for the Measurement of Democracy

A purely deductive approach to develop measurements of democracy in times of digitalization is limited to the less-innovative aspects of digitalization. Until a democratic theory is developed that systematically reflects upon digitalization – beginning with democracies’ core values and ending with procedures of the democratic process –, researchers have to choose an explorative research design to identify the changes and resulting challenges. Subsequent to this explorative phase it is necessary to successively include the results in the general (deductive) framework of the measurement approach.

Particularly the computational sciences (e.g. Computational Social Sciences) are of outstanding importance in this respect. To be truly able to identify the relevant changes democracies are subjected to because of digitalization, it is necessary to appreciate, include and maybe even engage in interdisciplinary research. Nevertheless, normative
aspects of democracy and democratic theory are often neglected in current interdisciplinary research.

As a purely digital democracy is not existing (so far) and the core values, institutions and procedures of the (analog) liberal-representative democracy have not been replaced by digital equivalents, we have to deal with a superimposition and simultaneity of analog and digital facets of democracy. This implies that the same tasks and procedures can be performed by digital and analog means at the same time (petitions are a good example). Still, fulfilling the same functional role of digital and analog procedures/modes of action does not mean that they are substitutable. How analog and digital procedures/norms/values ultimately relate is an empirical question: mutual coexistence, rivalry or supersession are possible at the same time on different levels, in different spheres or in different dimensions of democracy.

This is why we strongly recommend to separate the analog and the digital dimension in indices of democracy. Only a separation of this kind enables researchers to (a) calculate scores for the analog and digital dimensions of democracy, (b) identify tensions and effects of synergy between both dimensions, (c) analyze digital development levels synchronously and diachronically, (d) comparatively evaluate the “democratic level of digitalization” as independent variable.

The effects of digitalization on democracy become manifest in the rules in use, less so (so far) in the rules in law: All challenges we outlined above have already become reality within the stable constitutional orders of existing democracies. We assume that there will be no reforms of the constitutions of democracies in the near future that systematically transform constitutional norms and values as a consequence of ongoing processes of digitalization. Therefore, we recommend democracy indices to focus on the constitutional reality for the purpose of measuring democracy as the rules in law will not reflect the aspects highlighted in this paper.

These recommendations focus on the aspects of digitalization that are epistemically accessible on the basis of our established frameworks and for which we have identified

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18 This does not mean that it does not make a difference whether a procedure is realized digitally or by analog means: Even reading newspapers in a digital medium instead of the print version is significantly different and has different individual, social, economic, and political implications.
superimpositions between analog and digital phenomena. The skepticism regarding the adequacy of “analog” democratic theories for digitalized societies and democracies that we articulated above obviously poses the following question: How can we identify the unknown unknowns of today, those issues and challenges that are beyond the scope of our present frameworks? Unfortunately, it is not possible to offer a conceptualization of these radical transformations and innovations caused by digitalization here and to solve the corresponding epistemological problem of research on digitalized democracies.

6. Summary

We demonstrated in this paper that processes of digitalization already transformed democracy and will increasingly do so in the near future. The developments vary regarding their relevance and impact, their level of innovation and their time horizon. But already, there are spheres of democratic systems that are affected by digitalization to such an extent that these transformations and innovations have to be taken into account by indices of democracy if they are supposed to be valid in the light of these recent changes. Spheres that were named and elaborated on above included liberal rights protecting individuals against the interference of state institutions, participation rights (extension of means of participation due to digitalization) as well as problems posed by a new form of power – algorithmic power.

From this, we concluded that democracy indices have to include processes of digitalization and their effects on democracy in their conceptual approaches as soon as possible in order to maintain valid measurement. In the medium term, a methodological question will have to be discussed: How will the object of our analysis (i.e.: digitalized democracy) be assessed empirically? And is a “new” methodological approach necessary to be able to come to valid measurements? We are of the opinion that Big Data and Text Mining will be part of the methodological arsenal of the measurement of democracy. This causes subsequent problems that are situated on the level of these methodologies’ own validity.
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