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Curated Flows: A Framework for Mapping Media Exposure in the Digital Age

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Advancing theory in media exposure and effects requires contending with an increasing level of complexity and contingency. Building on established theoretical concerns and the research possibilities enabled by large social datasets, we propose a framework for mapping information exposure of digitally situated individuals. We argue that from the perspective of an individual's personal communication network, comparable processes of "curation" are undertaken by a variety of actors—not only conventional newsmakers but also individual media users, social contacts, advertisers, and computer algorithms. Detecting the competition, intersection, and overlap of these flows is crucial to understanding media exposure and effects today. Our approach reframes research questions in debates such as polarization, selective and incidental exposure, participation, and conceptual orientations for computational approaches.

What factors determine the sorts of messages to which citizens are exposed, and whether they learn about the public world? The question is central to the field of communication, which has set as one of its purposes an understanding of how citizens encounter news and ideas, and how those encounters influence opinions and behavior. Responding to the changes occurring in the digital media environment, recent theoretical work has called attention to various sets of factors ostensibly defining of content flows in the new media era. These include arguments favoring: (a) the power of the individual to design her own information environment, characterized as the "Daily Me" (Harper, 1997; Prior, 2007; Sunstein, 2001); (b) increased capacities for data-driven message targeting by strategic actors, leading to a "one-step flow" of information (Bennett & Manheim, 2006); (c) the shaping of content delivery by computer algorithms of organizations like Google and Facebook, a "filter bubble"

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(Hindman, 2009; Pariser, 2011); and (d) a revival of the two-step flow proposition (Lazarsfeld, Berelson, & Gaudet, 1948) through the social sharing of messages across digital media networks (Messing & Westwood, 2012).

Which of these views best describes information experience today? Which set of actors is most influential over the content individuals see, read, and hear? Likely, each view holds explanatory power under certain conditions. But the early stage of work in this area is such that these arguments have rarely been set in competition, and it is still possible for scholars to draw opposite conclusions about the implications of the new media environment for social and democratic processes (Donsbach & Mothes, 2012).

We respond to calls for theoretical innovation in the area of political message flow and media effects (e.g., Bennett & Iyengar, 2008; Donsbach & Mothes, 2012) by offering a framework designed to accommodate contemporary conditions of civic information flow.[1] Our starting observation is that these conditions are defined by proliferating *contingencies*: Under conditions of many channels, a dissolving producer/consumer distinction, and networked flows of content, the number of ways in which individuals' media experiences vary has multiplied. There is no one dominant pattern of content "flow"; there are competing patterns based on individual interests, social networks, and the infrastructures of digital communication. The challenge is how to account for this complexity in research design.

Our response is a framework of "curated flows," centered on the idea that the fundamental action of our media environment is *curation*: the production, selection, filtering, annotation, or framing of content. Unlike the mass media era, in which communication could be conceptualized as largely controlled by political elites and media actors, in the digital information environment processes of curation are also undertaken by actors such as friends and social contacts, computer algorithms, and individual media users themselves. In short, individuals are at the center of personal information networks embedded in multiple, intersecting content flows curated by various actors in varying proportions. Theorizing the dynamics of message reception and response in this environment increasingly depends on accurately mapping individuals' positions within these multiple curated flows. By placing these flows alongside one another in the context of a common process (curation), our framework highlights the work needed to understand which sorts of flow are most influential, for which people, under which conditions, to what effect.

We begin by noting the changing social and technological contexts that have led to rapid changes in flows of media and communication. Alongside these are methodological innovations that make possible the tracing of individual media experience with unprecedented granularity. It is in this context that our perspective on curated flows is developed—bridging media effects research and approaches to understanding the new media environment in terms of networks. We propose five categories of curating actors that can be used to map content flows for any given individual. Finally, we show how mapping these flows may contribute to major questions in the field.

Transforming media, society, and research tools

The past several decades have witnessed rapid social and technological changes taking place around the world. The latter include the fragmentation and proliferation of media, beginning with the introduction of cable television and reaching its (present) apogee with multiplatform, multidevice, global digital networks. This change has great consequences for the sorts of messages people receive, create, and distribute, potentially shifting the gravity centers of meaning-making power (Castells, 2009).

The social contexts undergirding received models of political message flows have also been overtaken by social and economic changes leading to citizens' increasing detachment from traditional groups (Beck & Beck-Gernsheim, 2002; Bennett, 1998; Inglehart, 1997). This is a reorganization of the social fabric from one in which local-level, formal group formations grounded individuals' identities and provided context for political message exposure to one in which individuals establish and maintain their own personalized networks—increasingly with the assistance of digital technologies that enable the bridging of space and time (Castells, 1996; Rainie & Wellman, 2012).

If in the broadcast era, mediated experience was collapsed across categories of audiences (Meyrowitz, 1986), our current time is one in which those processes are retreating; experiential worlds are becoming more idiosyncratic (McQuail, 2013). These changes place strain on communication theories that model content selection, persuasion, knowledge, and participation based on individuals' media repertoires (Bennett & Iyengar, 2008; Donsbach & Mothes, 2012; Gaines & Kuklinski, 2013; Mitchelstein & Boczkowski, 2010; Neuman & Guggenheim, 2011; Valkenburg & Peter, 2013; Vorderer & Kohring, 2013).

Technological and social changes have also made many aspects of individuals' media repertoires more accessible to researchers. Many formerly invisible moments of communication are made visible if they occur in digital spaces, as are many of the media selection choices of individuals, targeted communication from strategic actors, and so on (Latour, 2011). Emerging computational techniques, such as analysis of Twitter and Facebook news feeds, hold potential to improve our understanding of the complex realities of content exposure.

Scholars working in network science and related domains have made impressive use of new data sources to explore questions related to the growth and change of networks, patterns of content diffusion, and the bases of power in a network society (Adamic & Glance, 2005; Barzilai-Nahon, 2008; Monge & Contractor, 2003; Nahon, 2011). There remains work to be done to integrate findings from these studies into empirical research concerned with the effects of media use at the individual level (see Druckman & Bolsen, 2011; Himelboim, McCreery, & Smith, 2013; Messing & Westwood, 2012).

Given these challenges, how are we to productively build on: decades of valuable communication research; the recognition that citizens now inhabit a society organized largely on network bases; insights from network theories; and the

availability of digital data that offer impressions of individuals' media experiences, both "social" and "mass"? One answer, drawing on the 100-year-old work of Gabriel Tarde, is that we must reconsider how our notion of the research subject has been shaped by the tools we had available. Latour, Jensen, Venturini, Grauwin, and Boullier (2012), for instance, draw on Tarde's work to argue that rather than separating individuals from the social and communication environments in which they live—as survey researchers are usually forced to do—the advent of massive datasets may allow for a new level of research focused on individuals as they are situated in their local network of connections.

Within our own field, Wojcieszak and Rojas (2011) have described "egocentric publics," which translates the "egocentric social networks" of social network research (Wellman, 2007) for the communication field. They suggest that we see the "public" surrounding each individual as "transcend[ing] both mass audience and small-group social interactions, plac[ing] the individual at the center despite his or her broader network of relations" (p. 490). Specifically, what if we locate the individual as the unit of analysis—as traditional media effects research has—but also build for each individual a network of communication links one step out—as emerging research techniques allow us to do? Such an analysis would not provide a full network map (a task usually impossible when researching human subjects). But it could provide a partial, *proximate* network of the communicators that surround each individual (cf. egocentric social network analysis, e.g., Craven & Wellman, 1973). Such a proximate network may serve as a bridge between individual-level studies of media effects and detailed information from individuals' communication networks that so far has gone largely untapped.

The messages reaching an individual over a social networking platform such as Facebook serve as a useful example of this notion. There, an individual receives a given message because of its selection by at least one of the entities present in her personal "public": because a peer has sent it to her, or a newspaper she follows has posted it, or she has searched for it, or a strategist has paid for her to see it, or an algorithm thinks she might like it. The choices of communicating actors surrounding a person become constitutive of the media she experiences, with some categories of actors (presumably) more influential over that experience than others.

Curated flows

This discussion suggests that in the contemporary media environment, our opening question may be productively framed as: What sorts of communicators make up an individual's personal network? How do they choose what they pass along to readers or contacts? The answer will include journalists, social contacts, advertisers, and so on; given the complexity of the information environment today, each individual's experience is unique—no two people have exactly the same combination of social contacts and mass media preferences—but there also will be trends and patterns that may be mapped with appropriate analysis.

Investigating the contingencies of message exposure in the networked media environment therefore depends on conceptualizing the interactions of an individual, her personal network, and the content flowing over that network. To do so, we propose a concept of *curated flows*. We draw on the notion of curation because it is well suited to thinking through the dynamics of a media environment characterized by many speakers; information overload; and the necessities of selectivity, choice, and filtering (Scheufele & Nisbet, 2012). To curate is to select and organize, to filter abundance into a collection of manageable size, one that in its smaller shape fulfills an informational or strategic need more efficiently than the buzzing flow of all available options. We propose that each actor in an individual's egocentric public is a curator, curating a selection ("flow") of content for the individual's consideration.

Curation practices are now undertaken by a wider array of actors than in previous eras. In political communication, we are most familiar with the curation practices of news editorial staff (which we are accustomed to calling "gatekeeping"; Shoemaker & Vos, 2009); but today, comparable work is also done by presidential campaigns, interest groups, bloggers, algorithms, Facebook friends, and others (Barzilai-Nahon, 2008). The curation concept places all of these processes on the same plane by observing that although particular interests, norms, incentives, and network positions vary, the underlying process shares the essential feature of selecting certain content to highlight its significance. Below, we classify curators into sets, building on expectations from past research in communication about the norms, routines, and incentives various actors draw on when curating. We expect the *curation logics* at play within sets of curating actors to be more similar within than across sets—although the extent to which this is true is an important empirical question that can be explored within the curated flows framework.

Second, we adopt the term "flows" not only for its echo of earlier conceptualizations (e.g., two-step flow) but also because the term resonates with the fluidity of the contemporary media environment (Castells, 1996). We connect here to Barzilai-Nahon's (2008) theory of networked gatekeeping and her argument that in the networked media environment power over information flows is complex and dynamic. Power has in some cases devolved from mass media actors to networked actors, but there are now myriad combinations and relations between gatekeepers and the gated (Chadwick, 2013). However, our contribution is focused not on understanding dynamics at the level of a given media network (e.g., the network of Daily Kos users studied by Shaw, 2012), but on connecting what we know about those dynamics to information exposure at the level of an individual, who is a member of multiple, overlapping networks. Exposure to any given message (or, in aggregate terms, types, and frequencies of exposure) depends on a person's position within the multiplicity of intertwined message flows. The curated flows framework pushes us to ask what kinds of content are more likely in an individual's egocentric communication network given the interests and logics of the curators whose choices are most prominent.

Five sets of curating actors

We conceptualize five sets of curating actors: *journalists*, *strategic communicators*, *individual media users (personal curators)*, *social contacts*, and *algorithmic filters*. We do not claim that these five varieties account for every instance of curation that takes place, or that all actors within a category curate along identical lines: These are empirical questions within the curated flows framework, as we outline below. Rather, our aim is to bring together established theoretical concerns with a degree of parsimony necessary for theory building; the categories are thus starting points grounded in existing literature concerned with content flows over digital media (e.g., Bennett & Manheim, 2006; Messing & Westwood, 2012; Pariser, 2011; Prior, 2007; Shoemaker & Vos, 2009; Sunstein, 2001).

We should note that we are not the first to propose an actor-based typology of networked content flows. Agarwal, Bennett, Johnson, and Walker (2014) offered a classification scheme to make sense of content shared within networks of Occupy protesters; and Lotan et al. (2011) categorized actors who tweeted about the Tunisian and Egyptian uprisings in 2011. The curated flows framework performs a similar function, but at a higher level of abstraction that is more easily transported across a variety of political communication contexts.

Finally, although in this section we offer a description of each collection of actors as distinct, in the sections that follow we emphasize our interest in the areas of overlap and intersection among these curating actors. As Chadwick argues, a rich understanding of the political communication environment requires analysis of how actors and logics "blend, overlap, intermesh, and co-evolve" (p. 4).

Journalistic curation

Given the crucial role that journalistic media plays in shaping our information environment, it is little surprise that research on the sociology of news production and gatekeeping has built up a major body of knowledge about how journalists and their organizations go about their work (e.g., Gans, 1979). Our notion of journalistic curation aligns with the core idea of gatekeeping. However, rather than emphasizing the *negating* role of such processes—the keeping out of what is beyond the gates—the curation metaphor focuses on the way content is *promoted*—highlighting and drawing out what is most valuable from an otherwise unmanageable flood of messages. This metaphorical shift is apt as we move away from a media environment of relative information scarcity and a few, very powerful gatekeepers, to one of information abundance and an attention economy (Davenport & Beck, 2001).

Journalists now share the stage with a host of other information actors (Barzilai-Nahon, 2009). The relative influence of journalistic flows in this environment becomes an empirical question to be explored (Mitchelstein & Boczkowski, 2010; see also Meraz, 2009). Reports on the state of the news media reveal that resources devoted to the production of reporting continue to decline. We are also witnessing declines in habitual consumption of mainstream news media, particularly among younger cohorts (Patterson, 2008).

We must not lose sight of the powerful function that mass media still serve, with television continuing to be the primary source of political information for many publics (Chadwick, 2013), and newspapers continuing to break the preponderance of stories that then travel over myriad channels (Jones, 2009). But from a normative perspective, declines in resources dedicated to news and its shrinking audience are worrisome because news flows, for all their flaws, are typically seen as containing sufficient diversity to keep a citizen abreast of events of which she would not otherwise be aware (Sunstein, 2001). In the nomenclature of media logics, we might say that journalistic curators remain more likely to base their curation practices on a normative, or public-oriented logic—one linked to news values and concern for informed democracy—than a commercial logic (Landerer, 2013).

Strategic curation

For some scholars of political communication, the major story of the development of digital media has been the enhanced ability of strategic actors to bypass conventional newsmaking processes and speak directly to publics (e.g., Howard, 2006; Issenberg, 2012). Combining new communication technologies with datamining techniques, recent campaigns have used direct messaging at such levels that Bennett and Manheim (2006) proclaimed the emergence of a "one-step flow." Increased strategic curation in the public sphere could lead to a more fragmented public, as each citizen is systematically provided with messages most likely to resonate with (what strategists assume are) her predispositions and concerns (Turow, 1998).

Curations performed by strategic communicators are more likely to be conducted with incentives associated with commercial media logic (Landerer, 2013). In commercial media logic, curation choices are made to further the goal of maximizing profit (in the case of corporate entities) or maximizing electoral chances (in the case of political actors). An individual exposed to a relatively higher proportion of strategic curation may be less likely to be aware of opposing ideological views, as strategists fill her newsfeed with affirming messages. Such a concern also highlights the possibility of the spread of misinformation (Nyhan, 2010), especially if such information is substantially displacing curations that produce more even-handed message flows.

Personal curation

Another prominent observation—and concern—about digital media is that it enhances individuals' abilities to shape their own experiences of information to their liking (Donsbach & Mothes, 2012). This phenomenon is new more in scale than in concept: Uses and gratifications scholarship has long examined how audiences select content to satisfy a diverse set of needs (Blumler & Katz, 1974). What has changed in the recent era is the breadth of options available to the media consumer (Prior, 2007). To the decision to watch a television channel or read a newspaper has been added the choice to follow a journalist or a comedian on Facebook or Twitter, read blogs, or search for campaign information online. In the contemporary media ecology, *personal curation* thus becomes an important source of contingency when it

comes to exposure to political messages. Researchers and democratic theorists have responded with concerns over citizens' increased capacity to isolate themselves in self-built media cocoons (e.g., Sunstein, 2001).

Despite the increased role of individual choice in the new media environment, not all media exposure should be understood as the direct result of personal curation. Our concept of personal curation emphasizes active, intentional customization of one's media environment in pursuit of individual goals, following uses and gratifications. Research in this area demonstrates substantial differences across individuals in the degree to which their political message exposure (or message exposure in any topical domain) is a result of personal choice. Individuals vary considerably in the extent to which they wish — or are able — to actively shape their personal information environment (e.g., Garrett, Carnahan, & Lynch, 2011; Park, Kee, & Valenzuela, 2009). And even when a specific channel is opened by an act of personal interest — such as when an individual follows a politician on Twitter — the resulting flow of content is not under the individual's control. Instead, the user's act of personal curation serves to open up a flow of content curated by strategic communicators. In the case of a politician's Twitter feed, the flow of content across that feed will be shaped not only by the strategic communicator's desire to appeal to supporters but also by the desire to influence the agenda of journalists (Kreiss, 2014).

The extent to which trends toward silos and partisan echo chambers result from personal curation choices is hotly debated (e.g., Garrett, 2009; Garrett et al., 2011; Webster & Ksiazek, 2012), in part because, as noted above, personal curation is not undertaken to an equal extent by all individuals or equally across topic domains, and in part because of tendencies toward omnivorousness among intense news consumers (Gentzkow & Shapiro, 2011). We suspect another reality that existing conceptions have not had the tools to examine: that the effects of personal curation do not occur in isolation from other flows of content. The curated flows framework makes this possibility visible and testable.

Personal curations will often be undertaken based on the logic of personal interest. For example, Prior (2007) proposed that individuals with dispositional preferences for entertainment media over news increasingly opt out of news exposure entirely, leading to growing gaps in knowledge and participation. Recent work exploring the role of social media in promoting political participation has shown that those who opt in to news exposure on sites like Facebook and Twitter are more likely to be engaged (Gil de Zúñiga, Jung, & Valenzuela, 2012). This emphasizes another of the strengths of the curated flows framework: the ability to connect curation actions (personal filtering) with individual-level characteristics (partisanship, level of interest in politics, ability to customize digital flows).

Social curation

A further form of curation is performed by the human social network — friends, family, colleagues, acquaintances — to which an individual is connected. Communication scholars have long recognized the importance of *socially curated flows*, as in the classic

formulation of the two-step flow model (Lazarsfeld et al., 1948). Today, social media are resurrecting and potentially transforming some variety of the two-step flow phenomenon, and making much of that influence visible to researchers (Purcell, Rainie, Mitchell, Rosenstiel, & Olmstead, 2010; Wu, Hofman, Mason, & Watts, 2011).

We do not yet know the wider implications of information sharing across social networks. One possibility is that it will facilitate a return to a powerful two-step flow, in which social intermediaries mitigate and moderate other media's influence: This points to the need to re-examine notions of opinion leadership and differential roles within social-communication networks (e.g., Katz & Lazarsfeld, 1955). Further, as Messing and Westwood (2012) show in their experimental study of socially mediated information exposure, social cues may substantially mitigate partisan filtering of information.

Individuals increasingly choose the social networks with which they affiliate (McPherson, Smith-Lovin, & Cook, 2001). These affiliations are often based more on personal affinity and shared interests than on embeddedness in traditional forms of community (Bennett, 1998), potentially leading to greater degrees of homogeneity than were present in high modern social circumstances. That said, recent research suggests that online social networks in fact offer substantial *diversity* of informational content—even more than most people expect or realize (Bakshy, 2012; Goel, Mason, & Watts, 2010).

In terms of logics, the social curations an individual experiences will be largely a result of interests and opinions of one's social contacts. Ripe for additional research is the possibility that socially curated content works within a network logic, in which curators emphasize the potential popularity of content (put colloquially, how it will "go over" with your friends) above other concerns (Klinger & Svensson, 2014).

Algorithm curation

A final type of curation also implicates and overlaps each of the other four, at least in many online contexts. These are the curations of algorithms or other often-invisible (to the end user) decisions about what content is displayed to a user (Braun & Gillespie, 2011). These curations are set in motion by technical actors employed by the corporations that control many of the "digital intermediaries" that connect citizens to each other and to civic content in our current era. Curation by algorithm is only beginning to receive attention in popular media and from communication scholars (Gillespie, 2010, 2011; Pariser, 2011) as part of a broader interest in the role of online communication infrastructure in democratic processes (Hindman, 2009). Pariser (2011) brought the phenomenon of algorithm curation to popular attention with his explication of the "filter bubble." He describes how search engines such as Google provide different responses to identical search queries depending on data they possess about the individual conducting the search. Similarly, Facebook has drawn attention for its seemingly endless "improvements" on who and what content visitors see posted to their social news feed.

In a controversial experiment involving emotional manipulation, it has been shown that users' emotional states can be affected by algorithmic selection (Kramer, Guillory, & Hancock, 2014); the concern of many observers is that this form of curation may also have a profound impact on civic message exposure. The direction of that impact—toward or away from increased incidental exposure to news, perhaps—depends in great part on the programming decisions of actors working in spaces that provide little access to researchers.

But because algorithm curation is often based on data collected about individuals' behavior and preferences, many fear that algorithmic curation will tend to amplify trends toward information homogeneity at the level of the individual (Pariser, 2011). That is, not clicking on "news" stories will likely reduce the amount of news that appears in one's feed, thereby amplifying an individual's own predispositions. Such processes could extend the gap between the political information rich and the political information poor, and between the political left and right. Preference-driven algorithms may thus serve to complicate the layer of conscious choice that makes up the above-described personal mode of curation.

However, it is also possible to design systems that *promote* exposure to diverse content (Freelon, Kriplean, Morgan, Bennett, & Borning, 2012; Garrett & Resnick, 2011). Recommendation engines based on algorithms that calculate what you might like from what you have liked in the past, or what people like you have liked, can shape the spread of content well outside the left–right political paradigm. The communication logics employed by software designers may therefore amplify personal curation choices or counter them, just one example of the overlaps between flows within the curation framework, as we will see below.

Research questions generated by the curated flows framework

The organization of curating actors within a framework opens the possibility of exploring empirical claims about which aspects of the changing media environment are most significant, when, for whom, and with what consequences. In what follows, we outline a series of research questions raised by the framework, and consider how existing and future programs of research might be informed by a concern for curated flows.

The initial question we raise is simply: *Which curation processes are most significant in citizens' media experiences?* That is, what is the relative makeup of personal, social, strategic, journalistic, and automated curation in a person's information experience? We might also ask how do people differ in their individual curation profiles? What difference does social location make? Motivations and interests?

Exploring these questions holds great potential for a number of contemporary debates, including the polarization of audiences via information balkanization. For example, some research on personal curation has come to the conclusion that increased personal choice narrows one's exposure to opposing views (e.g., Prior, 2007). It follows that most citizens will experience a narrowing of media

experience—*but only to the degree that personal curation is defining of their message exposure*. For those who also see substantial information coming via other sets of curators, this outcome may be mitigated or nonexistent.

If this first step is adequate to test differences *between* the curating actors we have outlined, it elides the question of whether curation processes *within* a particular category are similar. We have categorized curations based on our synthesis of existing work, and have done so on reasonable grounds—journalists have been shown to operate under relatively similar sets of norms, and thus report similarly (Gans, 1979); there are good reasons for algorithms to be designed to select information concordant with users' existing beliefs—but it is not necessarily the case (Landerer, 2013). This should push us to ask: *What is the degree of variation among curating actors within each category? On what factors do the logics of curation depend?* We can imagine notable differences, for example, between personal curation oriented to maximizing ideological political content and that aimed at reducing the volume of opposing voices (Garrett, 2009). Similarly, social curation may expose individuals to a set of messages that are relatively more concordant or discordant with existing beliefs depending on a particular person's network of friends.

Compared to the curation processes of journalistic actors, we know very little about curations conducted by the other four categories of actors. Findings from studies of media uses and gratifications and of selective exposure could usefully be framed in terms of personal curation. Research to explore curation practices of the other three varieties has only just begun; the case could be made that research on other curating actors has in part been stunted by the lack of a framework within which an understanding of, say, strategic content curation or algorithm curation has empirical value. For example, as Garrett and Resnick (2011) point out, whether or not content algorithms will advance trends toward fragmentation and polarization largely depends on the ways that such content filtering systems are designed (see also Freelon et al., 2012). Rich, ethnographic research of the type conducted within news organizations could add substantially to our understanding of these design choices as they impact flows of political content.

Further questions are required to explore the impact of reception, such as *are different curations treated differentially by receivers?* A long history of research on source credibility suggests this is the case, and of particular interest will be untangling the reception of socially curated versus strategically or journalistically curated messages in sites like Facebook (Kang, Bae, Zhang, & Sundar, 2011; Koh & Sundar, 2010; Messing & Westwood, 2012). It is apparent that the same message may have different effects based on the particular curations through which it travels. But there is room for major new systematic work, for instance, looking at the assignment of credibility, relevance, and other judgments on information providers in the new media ecosystem.

This might include contending with increased contingency in communication process models of media effects. For much of the history of media effects research, we could assume some stability in the kinds of content and contexts through which political messages were delivered, or experimentally manipulate the sorts of content

to which subjects were exposed with only limited concern for distribution vehicle. Communication process models of political communication effects have done remarkable work to model the complexities in the chain of events that starts at the moment of message exposure and ends with some sort of outcome (participation, learning, and so on) (e.g., Cho et al., 2009). The contingencies on the other side of the chain, those affecting the contexts within which exposure occurs, have received less detailed examination. For example, Shen and Eveland (2010) pose and test an "intramedia interaction hypothesis," finding that different mixes of news media sources within an individual's media repertoire produce distinct—and not always additive—learning effects.

Answering the questions above will be complicated by the fact that *multiple acts of curation operate simultaneously or in series* within an individual's information experience, intersecting and overlapping. To briefly illustrate, one such intersection involves the entanglement of strategic and social curation, an increasingly common intersection particularly within political campaigning. Judd (2011) reported on an Ohio lobbying campaign that used voter-targeting data to help volunteers strategically target the most persuadable among their Facebook friends. In such a case, a message originating with a strategic communicator makes its way to an individual by way of a social contact (and likely an algorithm) on its way to being displayed. Which of these curations will shape the way an individual evaluates the message, or the extent to which the message is influential? Individual differences in message processing may play an important role here. For example, Kang et al. (2011) show that online news consumers vary in the extent to which they evaluate the credibility of multiple, distal curating actors or are simply influenced by evaluations of the most proximate curator, depending on the degree of topic involvement.

Social curation also intersects with the curations of other actors. Facebook users are more likely to encounter news content shared by a friend than they are to receive news directly from a news organization on the platform (Matsa & Mitchell, 2014). What we are describing here are the individual-level dynamics of what Chadwick (2013), with analyses primarily at the level of system-wide power contestation, has termed a "hybrid media system." The notion that social media is neatly replacing an earlier media system is mistaken: More than anything, social network platforms are spaces in which flows combine and intertwine. Further, social networking sites are only one part of the diverse media repertoires of citizens. The value of the curation framework, and the emerging research techniques it builds on, is that these can be at least roughly sorted out.

Citizens are receiving political information over an unprecedented number of devices, formats, platforms, channels, and locations, and a single perspective on how civic information flows to citizens is no longer sufficient. We offer the above research questions as starting points for mapping the choices and contingencies in the content that reaches citizens. Doing so can help place existing lines of research in conversation and call attention to areas where further work is needed, as we outline below.

Measuring exposure to flows: Comments on method

We close with notes on how the curated flows framework relates to established and emerging research techniques, with the goal of situating our contribution. The burst of data becoming available from individuals' online experiences is an exciting opportunity for research across the social sciences (Lazer et al., 2009). More than ever before, researchers are able to measure the characteristics of living networks of information flows and interactions that take place within them (Latour et al., 2012). This is, in some ways, a logical extension of a technique long used in communication research: asking respondents for lists of conversation partners and other acquaintances thought potentially consequential to opinion formation (e.g., Lazarsfeld et al., 1948). But the traces left when these conversations take place in digital spaces take us far beyond this: Direct measures of respondents' social network flows give us granular detail not only about how content and sources are networked in general but also how individuals differ in the content to which they are exposed.

One source of value of the curated flows framework is that it bridges the gap between individual-level survey data and network analyses in a way that offset limitations of each. We have already noted Latour et al.'s (2012) critique of the development of social theory in the context of measuring atomized individuals and aggregating to develop a picture of some social whole. Network science offers numerous insights about the role played by connections in structuring behavior and society (Haythornthwaite, 1996; Monge & Contractor, 2003; Scott & Carrington, 2011). And recently, the gathering of "big" data from digitally networked spaces has offered the potential to reconsider how information sources are interconnected and how individuals as actors are situated within living social and informational networks (e.g., Adamic & Glance, 2005; Himelboim et al., 2013; Papacharissi & de Fatima Oliveira, 2012; Webster & Ksiazek, 2012).

In the field of political communication, this work has, for example, contributed to our understanding of ideological polarization within particular networks (Adamic & Glance, 2005; Himelboim et al., 2013), with network gatekeeping in particular exploring how power may shift within information networks as traditional, elite gatekeepers are set in competition with an expanding array of curating actors (Barzilai-Nahon, 2008, 2009). Yet, our review of work in network analysis shows that it is limited in its ability to speak to the particular area of concern we have identified: how we comprehend the sorts of communication to which individuals are exposed. One reason is that many network analyses take as their focus a single (necessarily) bounded network, while individuals' media experiences are increasingly multifaceted, cutting across multiple networks, online and off.

With its focus on egocentric publics—which lie at the intersection of network analysis and traditional survey data—the framework of curated flows promises to both draw on previous insights and advance our work in new methodological areas. Data available from social media platforms allow the tracing of often substantial sharing histories—for instance, posts originating with a news organization, but shared one

or more times by social or strategic contacts—allowing us to unpack and classify the layers of curation leading to final content exposure. As we have argued, individuals' information experiences can thus be analyzed alongside self-report measures of opinion and behavior to reveal curation processes, their interactions with individual traits, and ultimately effects.

Some current research designs demonstrate the utility of this approach. Himelboim et al. (2013) illustrate the insights that emerge from combining network and content analyses. A series of studies by Ellison, Lampe, and colleagues used self-report measures of online social networks to generalize about connections between social network site behaviors and outcomes such as the development of social capital (Ellison, Steinfield, & Lampe, 2011; Steinfield, Ellison, Lampe, & Vitak, 2012). We are involved in an empirical research project implementing the curated flows framework. Our first study in this line of research focused on Facebook (Wells & Thorson, 2015); we are now working to extend, it to other social media platforms. Like many social media platforms, Facebook offers information about an individual and her media experiences. This includes information the individual has posted, the public "pages" the individual has subscribed to, or "liked"; and, crucially, the set of messages the person has received in his or her news feed. The latter record of messages flowing over an individual's social network experience offers an unprecedented opportunity to examine the curation processes making up one slice of a person's information experience.

To sort out those processes, we draw on four types of indicators: Facebook's designations of types of entities (individual friends, public figures, pages, etc.), types of relationships within Facebook ("friends," "likes"), our own coding, both by hand and automated, of public entities and links, and a self-report survey of the respondent's behaviors and attitudes. From these, it is possible to characterize the entities appearing in an individual's news feed according to the types of curation. For instance, posts coming from friends can be categorized as socially curated; personal curation can be detected based on survey responses and choices to subscribe to particular feeds; journalistic curation has taken place where a news organization has produced a post as well as when survey responses show news exposure via other sources (Wells & Thorson, 2015).

At this point, it remains challenging to detect algorithmic curation reliably, an important limitation for studies of this type. Elsewhere, we have emphasized the need for research that crosses social media platform boundaries in order to capture the actual information experiences of respondents (Thorson et al., 2013); the same will be required for future research on curated flows. Any of a variety of (rapidly evolving) social media platforms is itself only one node in a span of media repertoires actively developed and sometimes habitual, crossing between traditional media content in packaged in conventional forms (newspaper, television broadcast), blog reading (and posting), social newsfeeds online and off, online newspapers, news aggregators, and so on (LaRose, 2010; Yuan, 2011).

Nonetheless, this kind of research will add to our knowledge as to the rate at which a person receives political information at all, whether that content is more often

produced by strategic or journalistic actors, how often such flows intersect (e.g., a friend shares a news story from the *New York Times* or a post from a political organization), how often social contacts share certain types of political information, and so on. Sufficiently detailed data should also allow the comparison of different curation processes within a given category, and examination of cases in which a message is subject to multiple curation processes on its way to a receiver.

Finally, we must note the significant ethical considerations in this sort of research. Future studies will deal with a great deal of data that could include personal information. In current efforts, working with our institutional review board for human subjects research, we designed software that removes personally identifiable information automatically. Such concerns must be at the forefront of research of this sort as data of this sort become more available.

Acknowledgement

Note

1   We hope that our insights are applicable to processes of mediated communication writ large; however, to draw on our own expertise, and for the sake of focus, in this manuscript we primarily consider exposure to *political* communication.

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