



Article

# Information before information theory: The politics of data beyond the perspective of communication

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## Abstract

Scholarship on the politics of new media widely assumes that communication functions as a sufficient conceptual paradigm for critically assessing new media politics. This article argues that communication-centric analyses fail to engage the politics of information itself, limiting information only to its consequences for communication, and neglecting information as it reaches into our selves, lives, and actions beyond the confines of communication. Furthering recent new media historiography on the “information theory” of Shannon and Wiener, the article reveals both the primacy of communication in midcentury information theory, and also a striking resonance between these postwar communication theories and Habermas’s more recent communicative theory of democracy. To achieve a critical perspective beyond communication, the article proposes a media genealogy of the politics of subjects as a methodology for developing an analysis of how information formats us as subjects of data.

## Keywords

Communication, data, formats, Foucault, Habermas, infopower, information, Shannon, Wiener

## Introduction: communication and information in new media studies

The past few decades have seen an efflorescence of scholarship on the politics of new media, social media, digital technologies, mobile devices, algorithmic analytics, and

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other technological paraphernalia of our age. One crucial concern within this now-sprawling scholarly space, especially among those adopting theoretical and critical orientations, is undoubtedly that of the politics of communication. Communication has been a widely assumed, and even more widely deployed, conceptual paradigm for critically assessing the politics of new media. No doubt this is due, in part, to the fact that a substantial portion of new media studies has found an institutional home in departments of communication. Whatever the causes, it is today widely taken as true that, as Bruce Clarke notes in the influential volume *Critical Terms for Media Studies*, “communication and media are tightly bound together” (2010: 133).

What, however, do we decline to engage when we assess the politics of new media primarily in terms of their specifically communicative consequences? What, in other words, does the theoretical paradigm of communication encourage us to leave unexamined about new media? This question, of course, admits of many answers. I here explore just one—and one that moreover deserves our attention insofar as it has come to seem implausible at first blush. A communication-centric analysis of the politics of new media, I argue, is particularly underequipped to assess the information-specific aspects of new media politics. Put more generally, a communicative conception of politics is a liability wherever we need to develop an analysis of the politics of information itself. Communication and information both matter much for the politics of new media. But because so much scholarship has so thoroughly invested in a communication-centric analytic paradigm, we find ourselves today in need of additional perspectives capable of interrogating the politics of information itself. I argue that we need to more fully interrogate the social significance of information, or data,<sup>1</sup> beyond its communicative functions.

My argument complements recent contributions to media studies that betray an often-implicit recognition of the need for perspectives beyond communication. Recent studies of the politics of algorithms, platforms, and protocols suggest a shift beyond the horizon of communication as necessary for assessing other modalities of technological mediation.<sup>2</sup> My intervention furthers this recent trajectory while differing from it in two ways. First, despite delinking various aspects of high-tech infrastructure from the communicative perspective, recent work has thus far left unquestioned the bond between communication and information. Second, recent studies tend to take the present as their site of analysis. By contrast, to interrogate the politics of information beyond communication, I adopt a historical approach that builds on recent contributions to media genealogy,<sup>3</sup> and specifically their inspirational source in Michel Foucault’s work on the history of forms of subjectivity.<sup>4</sup> My focus is accordingly on the value of media genealogy for an interrogation of the status of information itself where we have all become subjects of our data, or what I call “informational persons.”<sup>5</sup>

I develop this argument as follows. In the first section, I situate the stakes of the argument with respect to an unquestioned consensus in the recent historiography of new media. The consensus view is that the midcentury theoretical programs of Claude Shannon and Norbert Wiener constitute a theory of information and that this theory forms a starting point for the information society in which we still live today. I aim to call this consensus into question. I do so by describing, in the following section, how the presumed theory of information founded by these midcentury theoretical scientists is in actuality a theory of communication, and moreover one that is by design ill-equipped to

address information itself. Continuing this argument, I turn after that to a section devoted to more recent political theory to show how communication-theoretic accounts of democracy, as exemplified by the work of Jürgen Habermas, are surprisingly resonant with midcentury theories of communication in their shared inability to address information itself as a political site. The implication of my argument up to this point will be that contemporary critical theories of the information society focused on postwar theories of communication are likely to perpetuate the neglect of the politics of information itself. These negative arguments then turn positive in the following section, where I outline an alternative approach for coming to terms with the politics of information itself. The alternative theory and historiography I propose is centered on a concept of formats. I propose leveraging the technical ubiquity of formats to show how information performs a work of formatting that is irreducible to the communicative work that information may also be made to perform. Deploying media-genealogical methodology, I excavate the work of formatting enacted by birth certificates as they emerged, or were installed, in the US context from 1903 to 1933. My claim is that birth certificates format their bearers, which is today nearly everyone, in specific ways that carry political consequences outside of (though not in opposition to) the communicative effects of this kind of documentary data. In the article's conclusion, I consider how formats function in strikingly similar ways from historical technologies such as birth certificates to contemporary technologies such as social media profiles. Formats of all kinds dispose us as subjects of data prior to our communicative exchanges. The formats of information, I conclude, enact a politics endogenous to information itself, in the sense that these politics are not derivative of something else to which information would be taken as invariably indebted.

## **The consensus historiography of information theory**

I have suggested that new media scholarship by and large (but not without exception) treats the informational core of new media as a derivative of communication. The clearest, and for my media-genealogical purposes also the most significant, examples of this can be found in recent contributions to new media history.<sup>6</sup>

New media histories have helped dampen our enthusiasm at the dazzle of the glittering information technologies in which our lives are immersed. Each latest device, service, and platform is presented as breathtakingly new. Each invites us to a much-anticipated moment of ground-zero release. And so, as the very name of an entire field of study would have it, new media must be defined, at least in part, by their new-ness. What could new media be if not new? Historical scholarship on new media helps us take this question seriously, rather than dismissing it as merely rhetorical. As Benjamin Peters (2009) observed in his contribution to the 10th-anniversary issue of this journal, new media histories show how the latest buzz is time and again built out of previous designs that go back well beyond last year, and indeed well beyond last decade.

Within new media history, there has emerged over the past decade a consensus according to which the originating moment of our newly mediated information society can be located in the postwar period, and specifically in the technical development and social acceptance of information theory.<sup>7</sup> This originating moment runs on two tracks: one technical and the other speculative. The technical track is exemplified by the work of Claude

Shannon, a Bell Labs engineer, who in a famous paper applying statistical methods to problems in communications engineering is frequently said to have given birth to information theory. The more speculative track is exemplified by the work of Norbert Wiener, a theorist on a grand scale if ever there was one. Wiener's cybernetics spanned numerous scientific and theoretical disciplines, and at the crux of his contributions was an information-theoretic idea of feedback. Wiener ([1950] 1988: 24) explicitly associated cybernetics with Shannon's work, while Shannon ([1948] 1949: 52n4, 81), for his part, also praised Wiener's contributions to information theory. Both published their most influential contributions to the onrushing tide of the information age in the year 1948.

The historiographical consensus focused on information theory, and its birth year of 1948, surely offers insight into the historical trenches into which our glittery new information age has settled. But there are also important aspects of the information age that the consensus view, just like the broader critical scholarship on new media I take it to exemplify, declines to interrogate. Specifically, I shall argue, this literature declines to engage information itself as a potential political problematic. It is not information theory that is our problem today, but much more pressingly, it is information itself that is our problematic. To interrogate the history and politics of information itself, we need to turn to a moment that is adjacent to the postwar focal objects of the consensus historiography. We need to turn to *information before information theory*. Doing so brings into view the dynamics of information itself without automatically suffusing information in the communicative assumptions that structured the postwar information sciences and that continue to structure in their wake contemporary critical attempts to come to terms with the ongoing fallout of those sciences. With this in view, a critical analysis of information itself could thereby survey what Donna Haraway's "A Cyborg Manifesto" presciently named "the informatics of domination" ([1985] 1991: 161), and it could make that survey without limiting it to a "struggle against perfect communication, against the one code that translates all meaning perfectly" (Haraway, [1985] 1991: 176). This would require engaging the politics of information beyond the assumption that information's politics is always the politics of communication.

To make this point about the politics of information, I turn in the next section to showing how the information theorists themselves were actually communication theorists who were unconcerned with information itself beyond its communicative uses, and then in the following section to showing how what is arguably the most important contribution to a communication-theoretic account of democratic politics manifests a similar lack of concern with information in its own right.

## **Information theory is really communication theory**

Recent new media scholarship often conflates the two core concepts of Wiener's and Shannon's seminal contributions: namely, the concepts of information and communication. The misappellation "information theory" carries as its unfortunate residue the implication that Shannon and Wiener's theories were primarily focused on information itself. Yet, the central focus of their work was not information at all, but rather communication. Both writers, of course, conceptualized information. But those conceptions were not so much full-blown theories of information as they were limited technical models of

information for the purpose of resolving problems endogenous to communication theory. If information theory is a theory of information at all, then it is a theory of information only for the limited purposes of communication.

This point can be gleaned from how Shannon and Wiener presented their own work. Wiener's ([1948] 1961) title plainly tells the tale: *Cybernetics, Or Control and Communication in the Animal and the Machine*. In the subsequent book through which he sought to popularize cybernetics, he argued that "society can only be understood through a study of the messages and the communication facilities which belong to it" (Wiener, [1950] 1988: 16). Throughout his work, in domain after domain, Wiener was clear that information is to be construed as a function of communication, as a "content of what is exchanged," rather than as a function or operation in its own right ([1950] 1988: 17).

The centrality of communication is even more striking in Shannon's work. The point is again signaled by the title: Shannon's ([1948] 1949) most important contribution to information theory was "A Mathematical Theory of Communication." This paper is exceedingly technical. But the "Introduction" section is colloquial and inviting. From the first sentence, Shannon commands the reader's attention by noting recent technical achievements that have "intensified the interest in a general theory of communication" ([1948] 1949: 3). That exactly, a general theory of communication, is what Shannon time and again said he sought, not a theory of information itself. He stated a few years later at the famous Macy Conferences on cybernetics, "My own model of information theory ... was formed precisely to work with the problem of communication" (Shannon in Von Foerster, 1952: 207). This was just one of Shannon's many attempts to keep his work squarely situated within the domain of communication.<sup>8</sup> His "Introduction" should, thus, be taken at its word in its precise statement of the problematic to which the essay is addressed: "The fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point" (Shannon, [1948] 1949: 3). Shannon frequently refers to these messages by the term "information."

One much-disputed feature of Shannon's theory is his insistence that the "semantic aspects of communication are irrelevant to the engineering problem" of communication ([1948] 1949: 3). What is most significant, he explains, is the statistical nature of information that can be communicated, a point he registers in stating that "the actual message is one *selected from a set* of possible messages" ([1948] 1949: 3), or as he put it in a later less technical paper, "information exists only when there is a choice of possible messages" ([1950] 1993: 173).<sup>9</sup> What is always relevant in every instance is that information to be communicated is chosen from a possible range of information, that is, that communicated information is always 1 of  $n$  possible information (where  $n$  is greater than 1). Any entity that can only send one signal (e.g. a continuous tone) is an entity with which one would not need to, indeed would not even be able to, communicate. As Shannon put it, "If a source can produce only one particular message its entropy [amount of information] is zero, and no channel is required" ([1948] 1949: 31). This feature of his view clarifies that Shannon's concern with information extends only as far as the possibility of devising a measure of amount of information for the purposes of efficient encoding as part of a communications system.

Shannon's great popularizer, Warren Weaver, could, thus, observe that the theory "is dealing with the real inner core of the communication problem—with those basic relationships which hold in general, no matter what special form the actual case may take" (1949: 115). Weaver explained how the statistical emphasis of Shannon's view is relevant to communication no matter what semantic contents are being communicated. The abstraction of semantics from the technical problem is not meant to eliminate the work of semantic interpretation from communication, as later critics have argued.<sup>10</sup> It is rather meant to situate that work within a more general theory of communication. Anticipating Shannon's later critics, Weaver offered an important correction: "It is almost certainly true that a consideration of communication [with respect to semantics and pragmatics] will require additions" to Shannon's model (1949: 115). What Weaver's claim implies is that there is no reason to suppose that Shannon's basic model could not be extended to include subprocesses of semantic interpretation as part of communicative interaction. Weaver's insight depends on Shannon's information theory being not itself a full-blown theory of information, but only a limited model of information for the purposes of a generalizable problem of communication.

The point that information theory is fully compatible with semantic theory seems innocuous, but it is in fact crucial. For it gets to the heart of why it matters that information theory is primarily a theory of communication. Information theory did not seek to specify what information is, but rather only accepted it as given. Information theory is, thus, not a complete theory of information and also not even primarily a contribution to the theory of information. It is, rather, first and foremost a theory of communicative carriers of information such that it simply presupposes information as a material sometimes in need of transmission.

The work of the postwar information theorists is, therefore, best understood not as unleashing the information society but rather as setting up what Orit Halpern dubs "the relentless encouragement of future communications" that would be dependent upon masses of already-intact information (2014: 74). From a historiographical perspective, the theoretical contributions of Shannon and Wiener are crucially important, but not so much in the manner of inaugurating the dawn of an information era as rather in the sense of ushering in a dusky consolidation of decades of preexisting information practices, that is, the information-centric practices that preceded information theory. As I further discuss below in making my positive case that there is a politics of information itself, the cultural configuration in which Shannon and Wiener (and all their exuberant readers) had been living for a few decades was already one in which information had achieved stunningly widespread use. Shannon and Wiener did not themselves invent abstracted and desemanticized information—it was their everyday starting point. The relentless communication encouraged by information theory was an afterimage of a relentless informationalization that preceded it and which it presupposed.

But what is lost where we take the basic data of communication as a given? To answer such questions, it is helpful to shift perspectives from the mid-20th-century theorists of communication sciences to some of their unacknowledged progeny among later-20th-century theorists of communicative democracy. What was left neglected (though perhaps benignly) by the communication scientists, namely, information itself,

is also precisely what gets neglected (and seemingly more problematically) by communicativist political theorists.

## **Communication theory cannot interrogate information itself**

Shannon's mathematical theory of communication addresses information mathematically (more precisely, through statistical formalization) so as to resolve technical issues confronting communications engineering. In remarkably similar ways, Habermas's political theory of communicative interaction addresses information formally (more precisely, through categorical principles) so as to resolve deliberative issues confronting communicative democracies. Both theories of communication can address themselves to information only insofar as information features within communicative exchange. Where information is not a feature of communication, it is ignored by these theories.

By explicating this point of resonance with Shannon's theory, I hope to highlight an unexpected political deficit in communicativist political theory writ large. This deficit concerns a structural incapacity to address information itself when it precedes or exceeds the communicative paradigm. If information does anything beyond or before whatever it also does communicatively, then any communicative theory of information (be it technical or political in orientation) cannot address itself to those aspects of information while also remaining within its chosen communicative paradigm. This feature of Shannon's view is concisely captured in Johnathan Sterne's observation that the midcentury information theorists "were concerned with the process, rather than the content, of messages" (2012: 88). The same, I now show, can be said of Habermas. The similarity is not insignificant.<sup>11</sup>

Habermas's conception of deliberative democracy holds that, "the central element of the democratic process resides in the procedure of deliberative politics" ([1992] 1996: 296). Such deliberative procedures offer normative guidance, or confer validity, to the extent that, as Habermas states in his categorical "discourse principle" of action, "all possibly affected persons could agree as participants in rational discourses" ([1992] 1996: 107). This principle presents an idealized theory of communication such that it can yield genuine normative guidance. What is involved in thus orienting democracy by communication?

The presuppositions of Habermas's communicative orientation are made explicit in his elucidation of the idea of "rational discourse" employed in his discourse principle: "'rational discourse' should include *any* attempt to reach an understanding over problematic validity claims insofar as this takes place under conditions of communication that enable the free processing of topics and contributions, information and reasons in the public space" ([1992] 1996: 108). Habermas's discourse ethics, at its most general level at which it applies to all species of moral norms including but not limited to democratic procedures, adopts a communicative perspective that takes as its starting point any information insofar as it is "freely processed." This view raises a crucial question about how Habermas conceptualizes information such that it is capable of being freely processed. Unfortunately, Habermas's theory offers no guidance on this question. All he suggests is that any signal capable of "free processing" counts as information that can fulfill the desiderata of rational communicative action.<sup>12</sup>

Habermas's communicative theory is not only silent on these questions, but it must be. The theory requires its own necessary inattention to the politics of information itself. Concerning the information that is to be freely processed in ideal communicative discourse itself, we can ask numerous questions. How is this information formed? How is it formatted? What burdens and benefits are embedded in, or enabled by, the formation of those formats? These are questions that a discourse ethics oriented entirely around communicative exchange cannot possibly answer.

This conclusion may seem counterintuitive insofar as it would appear that Habermas's communicative proceduralism could address itself to those formats that impede the communicative process. Formats surely play a significant role in the politics of communication. In preceding all communication, they help structure communicative exchange. Thus, it seems as if this prior structuring is precisely what Habermas's communicative proceduralism is designed to address.

The point, however, is that Habermas's discourse ethics can only ever address the prior structuring of formats as a function of their downstream effect on communication. In other words, it is only when formats distort communication that communicative proceduralism can countenance them. If formats initiate or reproduce other kinds of political or moral effects, a theory of communicative interaction must remain silent about them.

Indeed the problem runs even deeper than that. For communicative proceduralism must also unwittingly champion any such formats. Information that does not distort communication is precisely what deliberative democratic theory is designed to cultivate. Thus, if there is a politics of formats and that politics does not show up as a function of communicative exchange, then communicative democracies could only ever innocently reproduce, and never critically interrogate, such a politics.

This brings me to a precise specification of that which communicative theory cannot address: information perfectly capable of being freely communicated and yet, nevertheless, politically problematic in other ways. This would be a politics of information itself beyond and before any communicative politics of information exchange.

## **The politics of information itself**

My argument thus far boils down to the following: if there are data that precede communication, and if those data can potentially carry significant political or ethical consequences, then those significant consequences cannot be addressed at the level of the communication that takes those data as given.<sup>13</sup> I turn at this point to information before information theory so as to route around this constraint of the communication-centric paradigm.

In turning to information "before" information theory, I am urging that we need to consider information "before" communication. The "before" in this claim is both a nod to the historico-chronological precedents of what is so easily taken as new and also an index of the technico-practical work of assembling information in the first place. I concentrate my argument here more on historical dimensions than on technical implications. That said, my argument is also that historical precedent implies technical priority. So before turning to my historiographical claims, I need to briefly address an



important consideration at the technical level, which I shall do so by way of entertaining a plausible objection.

It could be objected to my argument that information necessarily entails communicability in virtue of the fundamental structures implicit in the machine-readability of data.<sup>14</sup> This objection calls into question my view that there are significant aspects of information that cannot be fully analyzed, comprehended, and countenanced in terms of communicability. The objection poses a problem for my view because, if its premise is correct, then communication-theoretic accounts of democracy would indeed suffice for inquiry into the politics of information insofar as communicativist accounts rely on the idea that information is in every significant respect necessarily communicable.

My reply to the objection is, of course, to deny its presupposition of communicability as an inherent feature of any data-bearing machine.<sup>15</sup> Indeed the very crux of my argument is that not all information-bearing machines are communication-capable machines. Consider, for example, an abacus that can store numerical data and yet cannot communicate that data in any relevant sense.<sup>16</sup> For an information-bearing machine to communicate its information, the machine must be set up to communicate, and this requires a great deal of work that exceeds the formats by which information is assembled. In other words, data cannot be self-communicating. As such, there are data prior to their communication, no matter how important their communicability may be.<sup>17</sup>

Turning now to the historiographical dimensions of information before information theory, these meet the technical matters just discussed in the following shared implication of each: Information itself is less the design of those who theoretically consolidate it for purposes of communication and more a mobile *mélange* arranged for multiple purposes by information technicians. This highlights, in turn, that every instance of information is formatted. The formats inherent in every last bit of information are not politically innocent.

To bring into view the stakes of informational formats beyond what can be surveyed by communicative conceptions, I propose a shift away from the politics of communicative transmission toward a media-genealogical analysis of the politics of subjectivation.<sup>18</sup> To motivate this shift, I borrow from Davide Panagia's (2019) recent argument that, in Foucault's genealogies, the terrain of the political is "not an instrument of meaning-transmission on the model of a linguistic utterance" but is rather a politics that consists "in the dispositional powers it makes manifest" (quotation from a draft ms. of in press article). Putting my argument in Panagia's terms, my claim is that there is a political assembly of information, and a distinctive power of formats, that is not wholly reducible to the expected ways in which information features in communicative exchange, but which is political because it disposes us as subjects of data prior to any communicative exchange. There is, in other words, a politics in the manifold ways in which information disposes us as subjects of data.

Foucault employed the term "modes of subjectivation" to orient his critical inquiries into the "history of the different modes by which ... human beings are made subjects" ([1982] 2000: 326).<sup>19</sup> This idea provokes a crucial question: What are we made to do? Genealogy gives this question its compelling double sense, whereby it points at once to the imperatives of power that guide our action and also to the histories of the crafting of these imperatives. Taking up such an analytic perspective in Foucault's wake enables us

to genealogically interrogate how media technology *defines us* (and is not only prosthesis for *communicating about us*) by formatting us as particular kinds of persons whose possibilities for action are conditioned in particular ways. A media-genealogical approach, thus, prompts an investigation of how information formats identity, personhood, or subjectivity. To what extent are we made by the formats of our data? What limits does that formatting set for who we can be and what we can do?

My answer to these questions is that we have become what I call “informational persons,” who are defined, in part, by what I refer to as operations of “infopower.” We are constituted by our data. We are not, as we would like to comfort ourselves into believing, merely represented by our data such that our data are but a way of communicating facts about us. Rather, we have become what Natasha Dow Schüll calls “datafied subjectivities” (2018: 28), or what I call “informational persons.” These labels propose that we take in full seriousness the assertion made by the title of John Cheney-Lippold’s (2017) *We Are Data*. Cheney-Lippold himself backs off from his provocative assertion in his claim that “we are ourselves, plus layers upon additional layers of what I have previously referred to as algorithmic identities” (2017: 5). On my argument, our informational identities are not layers on top of our true selves, but are true aspects of ourselves.<sup>20</sup> There is, therefore, a politics of how information formats our informational personhood. This is a politics of formats that extends beyond the comprehension of communicative paradigms. In the data structures that format us prior to any communicative interaction or interpretation of meaning, we find the politics of information itself.<sup>21</sup>

To make the case that we do in fact find ourselves confronting such formats, I offer as exemplary the formats enacted in a remarkable but quotidian information technology that historically preceded the elaboration of information theory, and which remains central for the social dynamics of new media today (I return in the concluding section to these new media). By excavating the emergence of this technology, I illuminate some of the techniques through which our data define us, or to be more precise, through which information formats us into specific kinds of subjects. The century-old technology I consider is that of the standardized birth certificate.<sup>22</sup> This technology is remarkable in the way that it metonymically formats our generalized entry into all of the information systems that help to format our lives today. The birth certificate constitutes our emergence as subjects living our lives through so many databases.

The standardization of birth registration technologies occurred in the United States over a roughly 30-year period running from 1903 to 1933. The first of these dates marks the year that the newly permanent Census Bureau introduced, in coordination with groups such as the American Public Health Association, its standard certificate of birth. The end date marks the culmination of a multiagency series of campaigns designed to encourage the use of the standard birth certificate in every US state. By 1933, every state could demonstrate that it was meeting the Census-defined standard for adequate birth registration: registration of 90%+ of new babies.<sup>23</sup>

What was achieved in those 30 years was the development and installation of a suite of information technology programs that would impress any data analyst today. At the turn of the century, the United States was home to multiple and conflicting birth registration systems that were only in sporadic use in most states. The lack of reliable data formats frustrated numerous efforts, from public health projects designed to lower infant

mortality (how many babies were actually being born such that we might accurately count the percentage who live beyond infancy?) to legal practices of establishment of title (how could one prove that one was heir or heiress in absence of nationally-recognized identity documents?) to later legislative reform projects (how could child labor law or old-age insurance be effectively managed without any kind of stable proof of date of birth?). Thirty years later, the informational infrastructure underwriting these, and so many other, projects was firmly in place.

It is easy, of course, to glimpse the gains of standardized registration in hindsight. But the recognition of those gains should not prevent us from interrogating the concomitant introduction of political potentialities that would be anything but neutral. To take just one example, one need only acknowledge the fact that birth certificates have functioned for over a century to render gender into formatted data to see the point. Only some gender identities are allowable, and though there may be some flexibility or choice in the formats provided, it was long obligatory that one choose (or rather have chosen for one at birth) one specific gender from among those allowable on the form.<sup>24</sup> Other requisite fields on the standard birth certificate served to format babies (and adults applying for what was called “delayed registration”) in numerous other ways. The first standardized birth certificate forms requested data on the “color” or “race” (there were debates on which term to use) of father and mother, as well as occupation of parents. Less obviously politicized than the fixing of gender and racial data achieved by these forms are other fields that are, however, not necessarily innocent. Consider, for instance, how effective a birth certificate is at establishing a singular, unchangeable (except by specific legal act), two-part (family and given), legal name. This could not have been entirely neutral when installed at a time in which it was simply not the case that everyone possessed such a name (a fact that feels remarkable to us today in a context where it just is taken for granted that we all have singular, static, two-part names).<sup>25</sup>

Nearing its century mark, the technology of the birth certificate is today near universal, and is moreover a universal that begins almost at our first breath and accompanies us beyond our death. Birth certificates are universal not in the sense that everyone is in possession of these ironically named “breeder documents” (so dubbed because they are the documentary gold standard from which all other informational identification is derived). Rather, they are universal, in that, everyone recognizes that they are a good thing to have. To be undocumented today is a truly debilitating political, social, and existential burden. This underscores my point that there are political stakes in how we are formatted, or fail to be formatted, or are differentially formatted, by data. It can be a major political and existential debility to be undocumented only if there is in place a system of documentation so rigorously formatted that it can be expected to be universalized for everyone.

The formats of data have a significant stake: They cannot be politically and ethically innocent. For they contribute to the construction of who we are, and who we can take ourselves to be. They simultaneously enable us to act in some ways and disable us from acting in others. They dispose us, in that, they subtly set us up to act in some ways and not in others. They format our subjectivity. They, thus, exemplify my Foucauldian point that the politics of data is not just an issue of what we can (or cannot) say, or what can (or cannot) be said about us, but is also more fundamentally a matter of who we can (or cannot) be.

## Conclusion: the information politics of social media

The political technology of the formats enacted by information before information theory is today leveraged for all manner of purposes that serve to deepen our entrenchment in a century-long history at the same time that they disclaim the presence of that history amidst our newest new media. To return in conclusion to those new media, consider now the most prominent social media service in the United States today. This service invites its users to supply the same kind of basic demographic information that populates their birth certificates, including gender, familial status, geography, and a requirement that users identify by their “real names” on the service.<sup>26</sup>

As has been observed in a plethora of recent scholarship,<sup>27</sup> social media’s precise repetition of older information technologies installed more than a century ago calls into question the presumed “newness” of new media. One crucial way in which new media reproduce what is old is in their reliance on formats of information that preceded not only new media but also the information theory upon which our contemporary new media rely. This is crucial because social media profiles contribute to the manufacture of subjectivity today in the very same ways that birth certificates have been formatting us for a century, and, in fact, by leveraging some of the very information architectures installed through birth certificates. It has become possible for you and I to be someone whose self-image is thoroughly enmeshed in the popularity attributed to what we share on social media, or to be a person whose self-conception is largely informed by the options available to us on our social media profiles. This recapitulates possibilities for selfhood set up by birth certificates around a century ago.

Bernard Harcourt (2015) argues that there is an “expository power” at work in the way in which social media elicit from us an eager participation in their dynamics of divulgence. Taina Bucher (2012) argues that there is an “algorithmic power” at play in the ranking algorithms, whereby social media services promote or demote our shares. Tarleton Gillespie (2010) argues that there is a “politics of ‘platforms’” taking place in social media. In a similar vein, I am arguing, there is a broader “infopower” in operation wherever these media technologies contribute to the formatting of who we are and what we can do.

Infopower’s politics of formatting us as subjects of data cannot be exhaustively captured in terms of the political dynamics of communications, important as those dynamics are. This difference matters because we undermine our potential repertoires of resistance when we conceptualize information as purely communicative. This idea was anticipated, though admittedly never really developed, in the work of Foucault’s onetime collaborator, Gilles Deleuze, in his own further collaborations with Félix Guattari, in which they wrote: “We do not lack communication. On the contrary, we have too much of it. We lack creation. We lack resistance to the present” ([1991] 1994: 108).<sup>28</sup> For the sake of resistances, now only dimly present, we cannot allow communication to be the total horizon of our engagement with the politics of information.<sup>29</sup> Thinking that it is would be to leave information entirely unchecked in whatever it does but refuses to tell. Among the deepest dangers of our increasing dependence on data is the possibility that we would be complicit in our own formatting in performing acts of communicative resistance that cannot but rely on information.<sup>30</sup>

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## Notes

1. I follow colloquial usage in treating “information” and “data” as rough synonyms. I reject a technical distinction between these concepts for two reasons: first, in order to remain consistent with the historical material I consider (the distinction is not important for midcentury information theory or in earlier information technology practices), and second, because the distinction itself is conceptually untenable, as noted by Bowker (2005: 183) and Gitelman (2013).
2. On algorithms, see Bucher (2012), Gillespie (2014), Crawford (2016), and Cheney-Lippold (2017); on platforms, see Gillespie (2010); on protocols, see Galloway (2004).
3. See Monea and Packer (2016) and Apprigh (2017) on media genealogy, an approach building both on work by Foucault and on media archeology in Kittler ([1986] 1999) and Vismann ([2000] 2008). My own approach to media genealogy is largely by way of Foucault as described in Koopman (2013).
4. See Foucault ([1982] 2000). My proposal also raises the possibility of the value of a media-genealogical approach to latest-generation algorithms, platforms, and protocols—but this intriguing possibility is not pursued here, so that I can focus on a media genealogy of subjectivity, or what might also be called a genealogy of media technologies of the self.
5. See Koopman (2019) for a fuller elaboration of informational personhood; the present article draws from arguments developed in the book.
6. An equally instructive example is the work of Terranova (2004a, 2004b), which, in many ways, approximates my efforts here and yet ultimately refuses to distance itself from a central concern with “cultural and political struggles over media and communication” (Terranova, 2004b: 70) and “communication biopower” (Terranova, 2004a: 131). For just one recent example on the politics of data indebted to a communicativist perspective, see Harper (2016).
7. An exhaustive citation of recent work endorsing this view would be so unwieldy as to require a database to organize. Paradigmatic statements include work in critical new media theory by Hayles (1999), media archeology by Kittler ([1986] 1999), communication and media history by J. Peters (1988), and critical science and technology studies by Haraway ([1985] 1991).
8. In his famous 1956 article “The Bandwagon,” Shannon similarly cautioned those who sought rapid deployment of information theory beyond its intended use as “a technical tool for the communication engineer” (1956: 3). Shannon’s repeated emphasis on this distinction is largely missing in the critical historiography on information theory cited above, with the exception of Kline (2015: 126).

9. Wiener too emphasized this point ([1948] 1961: 10, 61).
10. See the canonical criticisms of Shannon's view by Hayles (1999: 53; 2010: 146).
11. Despite this clear strategic resonance, there is to my knowledge no sustained discussion of the connection between Shannon's information theory and Habermas' communicative rationality. In noting this resonance, I offer an alternative to Geoghegan's (2011) suggestion that American information theory found its European counterpart in French poststructuralism. Relatedly, the resonance I chart here between Shannon's theory and Habermas's Kantian pragmatism has a parallel in the underexplored connection between Wiener's cybernetics and pragmatist communication theory, as recently noticed in Peters and Peters (2016) and my own forthcoming work in Koopman (2019, ch. 5).
12. The criticism I pursue here needs to be differentiated from familiar critiques of Habermas's formalism, that is, his agnosticism about the contents of the substantive communicative claims that might be made in a context constrained by the procedures he adduces. I, in fact, do not find his formalism pernicious, for I see no reason why a Habermasian perspective cannot build in at local levels additional constraints designed to take account of communicative contents. This could be developed in the same way that Weaver thinks Shannon's information theory can be built out to accommodate semantics.
13. See Rosenberg (2013) on the etymology of "data" and its Latin roots for "what is given."
14. This view is widespread, at least if I am correct in my opening statement that new media studies is saturated in communication but strangely quiet about information itself. Although this view is widely assumed, it is nevertheless infrequently stated. One might trace the view back to so-called "information theory" itself, especially as formulated in Wiener's cybernetics, which two eminent scholars have recently described as holding that, "Information means instructions to be carried out by another information machine, just as every bit of information can be the means for the generation of another information machine" (Peters and Peters, 2016: 168). The objection might be stated in technical terms as follows: any data  $n$  readable to machine  $M$  are necessarily tethered to the essential communicability of  $n$  between  $M$  and other machines.
15. Put in more technical terms, that data  $n$  are readable by machine  $M$  does not imply that  $n$  are communicable among multiple machines, unless it is the case that  $M$  is already a (successfully) communicating machine.
16. Of course, one might redefine "communication" such that it refers also to the mere physical state of affairs of an abacus being visible to the eye of a human who can read it. Such argument-by-redefinition stretches the word so thin that every physical state of affairs in the world counts as communicating. The word, thus, loses any distinctive value that would give the objection the force that it wants to have.
17. The claim that data cannot be self-communicating is an instance of a more general point that nothing can contain entirely within itself the rules for its own application or replication. One seeming counterexample to my claim here is that of the self-replication of the information contained in DNA. Yet, this is actually not a counterexample, for it was only a fantasy of 20th-century molecular biology that our genetic code was self-replicating on its own terms, a point brought home by research in postgenomics over the past two decades. Genetic self-replication is also raised in the above-cited discussion by Peters and Peters (2016: 168) and of course by Wiener himself in his discussion of "machine genetics" (1964: 48) and "self-propagating machines" ([1948] 1961: 177).
18. Although I develop my analysis here in Foucauldian terms, this is not the only methodology useful for investigating these ideas. See resonant work cited above in note 2. Another theoretical alternative made available by Foucault's own milieu of 20th-century French philosophy is that offered in the work of Simondon (1989), whose informational ontology as described by Iliadis (2013) resonates with my approach.

19. See also more recent work in this vein by Hacking (1986) and Davidson (1990) on “kinds of people.”
20. Cheney-Lippold’s enticing provocation is ambivalent on this point. At one point, Cheney-Lippold (2017) takes away from his title precisely what makes it compelling: “‘We are data’ is not a claim that we, individually, are data” (p. 4). Elsewhere, he both claims that “we are made of data” (p. 251) and denies that “we are literally made of data (clearly, as I look to my fingers typing, I don’t see random ASCII characters or lines of code)” (p. 197). It appears as if “data” are for Cheney-Lippold a mere metaphor, that is, a mere media of communication, rather than a robust media of disposition.
21. To be clear, there may be other politically salient qualities of information, but it is in the work of formats that we should locate the political enactments of information itself. See further on formats, the important work of Sterne (2012).
22. Histories of other chronologically proximate technologies would also afford differently illuminating exempla. For analyses of two similar first-generation “Big Data” projects, see Monea (2016, ch. 3) on the 1890 census, or my own work in Koopman (2019, ch. 1) on the assignation of Social Security Numbers to 90%+ of eligible American workers in 6 months during the winter of 1935 to 1936.
23. This paragraph is based on details elaborated in my own work in Koopman (2019, ch. 1) and Critical Genealogies Collaboratory (2018); see also Marshall (2012) and Pearson (2015).
24. See Currah and Moore (2009) on the politics of gender formatting (this being my term, not theirs) enacted by birth certificates; see relatedly Spade (2011).
25. See Caplan (2001) on the histories of names in Western societies.
26. On Facebook’s real name policy, see Haimson and Hoffmann (2016).
27. See discussion above in the section titled “The consensus historiography of information theory.”
28. See also Galloway (2012: 128).
29. For an example of work I regard as looking toward post-communicativist resistance, see Gehl (2014, 2018) on dark web social networks.
30. For comments on an earlier version of this article I thank my collaborators in the Critical Genealogies Collaboratory at the University of Oregon and in particular Bonnie Sheehy and Patrick Jones for detailed feedback), an audience at the Western Political Science Association (including my colleague and panel commentator Anita Chari), and reviewers for this journal whose comments facilitated important improvements on a few key points. For extensive comments on a forthcoming book chapter related to matters discussed in this article I thank Verena Erlenbusch-Anderson.

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