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Social epistemology as a new paradigm for journalism and media studies

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Abstract

Journalism and media studies lack robust theoretical concepts for studying journalistic knowledge generation. More specifically, conceptual challenges attend the emergence of big data and algorithmic sources of journalistic knowledge. A family of frameworks apt to this challenge is provided by "social epistemology": a young philosophical field which regards society's participation in knowledge generation as inevitable. Social epistemology offers the best of both worlds for journalists and media scholars: a thorough familiarity with biases and failures of obtaining knowledge, and a strong orientation toward best practices in the realm of knowledge-acquisition and truth-seeking. This article articulates the lessons of social epistemology for two central nodes of knowledge-acquisition in contemporary journalism: human-mediated knowledge and technology-mediated knowledge.

Keywords

Echo chambers, epistemology, evidence, fact-checking algorithms, journalism, knowledge, news practices, testimony

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Introduction

Media scholarship studies the social implications of the new media environment. Some of these implications are discernible in the reorganization of work inside media organizations which have undergone digitization (Usher, 2014); in the emergence of high-speed media channels, for example, Facebook, Twitter, live blogging, breaking news, rolling news, push notifications, and news alerts (Rom and Reich, 2017); in media organizations' attempts to develop business models which take digital realities into account (Cook and Sirkkunen, 2013), and in digitally driven challenges to the social status and the professional self-conception of established media and media personnel (Carlson, 2018).

One set of social developments driven by new media is, however, easy to overlook: the evolution of knowledge and the standards of knowledge generation in the digital age. This follows both from the abstract nature of knowledge and the radically divergent understandings of knowledge in the extant scholarship. We argue that a body of scholarship in the philosophical sub-discipline of social epistemology can address this neglect. We focus on journalism-mediated knowledge, as journalism remains, even in the digital age, society's most established and pervasive form of generating and pooling knowledge across all walks of life. We demonstrate the utility of social epistemology by discussing journalistic knowledge from human sources and from new media technologies.

Conceptions of knowledge in journalism and media studies

It has been long anticipated that technological developments, particularly those characteristic of the digital age, might alter journalists' conceptions of evidence, the properties of the evidence available to journalists and hence the nature of journalists' knowledge. Such powers are attributed to big data analytical tools and computational and algorithmic journalism, as well as to new media environment more generally (Anderson, 2013; Mor and Reich, 2017; Nielsen, 2017; Parasie, 2015; Rom and Reich, 2017). To assess whether the existing literature is up to the task of rendering such judgments, let us critically examine the available conceptions of knowledge in mainstream journalism scholarship.

A dominant approach in mainstream journalism scholarship toward journalistic knowledge articulates an anti-realist position or, at a minimum, agnosticism about objective facts. A seminal work in this vein is Gaye Tuchman's. Although Tuchman (1972) explicitly mentions "presentation of supporting evidence" (p. 667) as a journalistic procedure, her account of evidence is in essence social constructionist rather than truth-oriented: "supporting evidence consists of locating and citing additional 'facts,' which are *commonly accepted as 'truth'*" (Tuchman, 1972: 667, quotation marks and emphasis in original). Tuchman does not preclude common acceptance of false beliefs, and for her, facts and truth are generated by people's common acceptance, rather than at least partly independently of individuals' or groups' beliefs or wishes. Furthermore, Tuchman (1972: 675) explicitly regards "facts" as constituents of journalists' knowledge.[1]

Such views are not exclusive to Tuchman's work. As Raymond Lau (2004) documents, a similar position was held by Mark Fishman, another seminal news ethnographer, well into the 1990s. Lau (2004: 700) quotes Fishman to the effect that

[…] news is neither a reflection nor a distortion of reality because either of these characterizations implies that news can record what is "out there" […] the notion of "news selectivity" [is wrong] […] in its assumption [of the existence of] […] entities "out there" in the world. (Fishman, 1997: 211, 213 cited in Lau, 2004)

The same position appears in a commendably lucid fashion in Molotch and Lester (1974: 104 F6), who state that "our schema does not make an objective distinction between telling a truth and telling a falsehood." As Godler (2018) documents, Molotch and Lester's anti-realist view is widely endorsed. Likewise, Richard Ericson (1998: 84), a prominent (former) ethnographer of journalism, defined "Fact […] simply as that which is accepted as reality." He saw acceptance as constitutive of facts, which are not independent of human beliefs or wishes. The same position was held for many years by leading media sociologist Michael Schudson, until it was partially and ambiguously recanted in a 2005 version of his multiply revised state-of-the-art literature review (Godler, 2018). As Schudson (1989: 274) has written, "[N]ews is not a report on a factual world […] it is not a gathering of facts that already exist[s]." Indeed, even Herbert Gans (2004), who promises that he "shall not debate the possibility of determining what journalists call facts" (Gans, 2004: 306), ends up conditioning the determination of facts in journalism upon social consensus, or more precisely, on a situation in which "there is agreement on the concepts and methods" (Gans, 2004: 311)—an "agreement" which Gans crucially believes to arise, inter alia, from "value judgments" (Gans 2004: 306).

Even studies explicitly focused on the epistemology of journalism have largely excluded extra-mental and extra-human determinants of knowledge. For instance, Ekström (2002: 260) makes clear: "I am not interested in evaluating how truthful or objective journalistic accounts may be." Ekström echoed Ettema and Glasser's (1985: 185) qualification: "[O]ur inquiry presupposes no absolute or objective standard of justification; a justified belief is nothing more or less than belief 'that has been shown to be legitimate within a context of justification'." More recently, Parasie (2015: 365) has endorsed the view that the study of journalistic epistemology should "not […] evaluate whether journalists' knowledge claims are valid or not, but merely […] examine what journalists consider to be acceptable claims."

The conception of knowledge, then, that leading scholars of journalistic knowledge harbor is not one whose notions of evidence and truth objectively capture aspects of a mind-independent world. In contrast, many philosophers understand knowledge as "justified true belief" (Ichikawa and Steup 2018),[2] such that truth is understood in terms of correspondence to a mind-independent world, and justification in terms of epistemic validity or reliability. On this view, knowledge does not necessarily require social acceptance. While many philosophers recognize that knowledge has social dimensions, most of them do not think that the concept of knowledge can be fully captured by reference to social agreement alone (Longino, 2002).

The foregoing calls for a theoretical framework of journalistic knowledge, which would remedy the neglect of truth and evidence within journalism scholarship. Moreover, educational and practical solutions to journalism's challenges in the realm of knowledge-acquisition cannot be thought of without an authentic understanding of what journalistic

knowledge-acquisition is. Therefore, a theoretical framework of journalistic knowledge should

1. Help journalism beat back unwarranted attacks on its reliability, which are expressed nowadays in the idiom of "fake news" but were expressed in the past in the academic locution of anti-realism and radical social constructionism;
2. Bridge the gap between how scholars and practitioners view journalistic fact-finding;
3. Utilize existing philosophical insights on knowledge;
4. Be empirically informed, namely, concerned with actual practices among fact-finders;
5. Attend to the social context of knowledge creation, specifically journalists' deep and extensive epistemic reliance on others;
6. Set high standards for best fact-finding practices, and detect practices that fall short of them;
7. Coherently incorporate elements from a diversity of approaches ranging from ostensibly conflicting ends of the philosophical debate, such as realism and social constructionism;
8. Address the generation and consumption of journalistic knowledge from technological sources, for example, algorithms and big data.

A family of theoretical frameworks flying the banner of "social epistemology" satisfies these desiderata. It matured in the late 1980s within academic philosophy out of long-standing debates about the epistemic status of secondhand information (Fuller, 2002; Goldman, 2002, 2011). Surely, it is not the only body of work linking society to knowledge (see Bhaskar, 2013; Lau, 2004; Ward, 2004, 2009),[3] but it is the most fully articulated *epistemological* body of work to lay out desirable standards of knowledge-acquisition within a social context.

We begin with an overview of social epistemology, and proceed by addressing two encompassing sources of knowledge in journalism: the testimony of human sources, which have always contributed the bulk of published news (Reich, 2009; Sigal, 1986; Tiffen et al., 2014), and the deliverances of technological sources, whose share of news is on the uptrend (Reich, 2018). We do not claim to deal exhaustively with either subject, but hope to inspire future research, thinking and educational efforts.

What is social epistemology?

In what follows, we refer to epistemology in a philosophical sense, which presupposes that at least some objects of knowledge exist and that some ways of knowledge-acquisition are superior to others in approximating these objects.

Social epistemology studies the acquisition of beliefs from the testimony of others, the epistemic design of institutions in charge of knowledge generation and dissemination, and the implications of the social dimensions of knowledge to our understanding of knowledge, justified belief, and rationality.

Modern epistemology has traditionally focused on how an individual acquires knowledge through his senses, memory and reasoning. Paraphrasing Kitcher (1994, 113), the point at which epistemology becomes social is precisely where knowledge turns on the properties of other people. Social epistemology thus extends the scope of epistemology from the cognitive processes undergone by a subject to the social activities of others in her immediate, distant, present, and past social environments (Kitcher, 1993: 160).

Three events in 1987 and 1988 mark the formation of social epistemology as a recognized subfield of philosophy. The first is a special issue of the philosophy journal *Synthese* (vol. 73 issue 1, 1987), in which the two founding fathers of the field, Alvin Goldman and Steve Fuller, published their respective manifestos (Fuller, 1987; Goldman, 1987). While Goldman argued for social epistemology as a truth-seeking enterprise, Fuller pushed for a critical political approach toward knowledge. In 1987, Fuller founded the journal *Social Epistemology*, which he edited for several years. Goldman became the editor of the newly founded journal *Episteme* in 2006. These are the two main journals of the field, though *Episteme* has broadened its scope since. In 1988, Fuller published the book *Social Epistemology*. In 1992, Anthony Coady published the book *Testimony*, which turned the epistemology of testimony into a major research subject.

Today, social epistemology is a lively field, populated with competing views and approaches. They are dividable into three camps: orthodox, revisionist, and reformist. Orthodox social epistemology preserves the prevalent tendencies of analytic epistemology in the Western philosophical tradition, which has its roots in Enlightenment philosophy. Orthodox social epistemology analyzes and normatively evaluates social routes to knowledge using the traditional notions of truth and rationality, while typically ascribing knowledge to individuals, rather than communities (Goldman, 1999). Revisionist social epistemology wishes to abandon or radically redefine such traditional notions. It typically regards communities, not individuals, as the primary bearers of knowledge. That is, it views individual knowledge as derivative from communal knowledge (Fuller, 2002; Kusch, 2002). Reformist social epistemology seeks a middle ground between these two extremes. It wishes to reform traditional notions in epistemology making them more attentive to the social dynamics of inquiry, knowledge dissemination, and our epistemic dependence on others, while still offering a basis for normative epistemic appraisal of beliefs (Fricker, 2007; Longino, 2002). In other words, reformist social epistemology recognizes that knowledge is not merely a property of the individual mind, while still postulating standards for valid knowledge claims. The next two sections about testimony and digital technologies demonstrate the relevance of social epistemology to the study of knowledge in journalism and media studies.

Testimony-based knowledge in journalism

Usually, journalists cannot obtain and convey knowledge without human sources (Reich, 2009; Reich and Godler, 2017). Journalists cannot zap to distant scenes, access every institution or understand every bit of expert knowledge. Time and resources constraints often compel journalists to minimize investigative effort or rely on PR professionals and other interested parties, which provide journalists with information subsidies (Gandy, 1982; Hallin, 1994). Human sources pose knowledge-related problems for journalists:

journalists can never enter an eyewitness's head, they cannot always (and can never with certainty) gauge a whistle-blower's intentions or sincerity, they cannot challenge a scientist's claims like her peer, and they might not have the professional leeway to verify every single claim by a politician or a spokesperson.

Thus, journalism scholars have been suspicious of journalists' ability to gain knowledge at secondhand. Secondhand knowledge was seen as organizationally and practically necessary, but as epistemologically problematic (Ericson, 1998; Fishman, 1980; Gans, 2004; Molotch and Lester, 1974; Schudson, 1989; Tuchman, 1972). Although these journalism scholars emphasized the social dimensions of journalists' belief formation, they were skeptical about journalism's ability to generate knowledge which entails truth. In other words, while their data illuminated the social context of journalistic knowledge-generation, their critical conclusions remained in line with orthodox individualistic epistemology in that only individually ascertained information counted as factual knowledge (see Godler and Reich, 2017 and Lau, 2004 for further documentation).

In contrast, prominent social epistemologists see testimony as a normal and benign source of knowledge. They reject the ideal of the self-sufficient epistemic subject who gains his knowledge only from his own senses and reasoning (Fricker, 2006). They conceive of little knowledge that individuals possess by virtue of direct knowledge-seeking efforts, and do not unrealistically expect individuals to engage in extensive research whenever faced with another person's factual claim. Inevitably, much of knowledge is mediated, secondhand knowledge (Hardwig, 1991; Lipton, 1998; Miller, 2015).

A central debate in the epistemology of testimony concerns the nature of the warrant of testimonially obtained beliefs. Two main views exist, reductionism and non-reductionism, which differ about the default rule for accepting testimony. Non-reductionists hold that the norm of truth-telling is prevalent in society, such that by default, a testimony can be presumed to be correct unless its recipient has reasons to doubt it (Burge, 1993; Coady, 1992; Goldberg, 2010). By contrast, reductionists believe that testimony is generally too unreliable to be believed by default, and argue that a recipient of testimony must minimally verify it before believing it (Fricker, 1994, 1995).

In their daily work, reporters typically face someone saying something (Fishman, 1980; Sigal, 1986; Tiffen et al., 2014). This is the stuff that the majority of news reports are made of, and because of their public nature, the building blocks of public understanding of the goings-on in society. However, we are not merely interested here in different types of sources, but in different challenges in obtaining knowledge from sources. Sometimes, these stem from the nature or identity of the source, but sometimes from the nature of the circumstances surrounding journalists' reliance on a source. We will now review, from a social epistemological perspective, common instances of reporters' reliance on sources and elaborate on the preconditions of reasoned reliance on and dismissal of secondhand, or testimonial, information.

Testimonies of distant events: Individuals present at distant locations routinely tell journalists about their experiences and observations. What are the underlying considerations which make such reliance appear intuitively legitimate to journalists and wider society? Are there any exceptions to this generalization? For example, Israeli journalists often interview Israelis living abroad about distant occurrences, such as hurricanes and

floods. These testimonies are taken at face value. But should they? Social epistemology offers principled answers to such questions. As mentioned, according to testimonial non-reductionists, absent overt reasons to doubt a testimony (reasons termed "defeaters"), testimony can be relied upon by default just as one relies by default on one's senses or memory (Burge, 1993; Coady, 1992; Foley, 2001).

To some readers, this may come as a shock. Why would any say-so be regarded as reliable by default? Are epistemologists a naïve bunch? Yet as early as 1764, Scottish philosopher Thomas Reid (2002) argued that there are strong grounds, anchored in human nature, for trusting testimony by default. However quaint at first glance, Reid's view resonates with 20th-century theorists that have anchored the human capacity to interact socially in the biological makeup of the species (Ilyenkov, 2007; Vygotsky, 1980). Reid observes two human tendencies that make possible the formation of knowledge from testimony. One is children's tendency to trust adults by default until they encounter instances of deceit. The other is the psychological truism that lying requires cognitive effort, whereas telling the truth does not. Nature, so Reid thought, has wired the human race to rely on others in the formation of their beliefs. Although we do not argue for Reid's views, they exert a significant influence on contemporary social epistemology. Second, non-reductionists argue that there are reliable enough subconscious monitoring processes that prevent listeners from believing suspect or deceptive testimonies (Goldberg, 2007: 148; Sperber et al., 2010). People's tendency to tell the truth together with recipients' reliability monitoring ensures the smooth flow of knowledge in normal circumstances.

Expert testimonies: Journalists routinely rely on academic experts and other bearers of technical or esoteric knowledge. Journalists may seem powerless to adjudicate experts' knowledge claims, as they typically cannot possess the same apparatus as the experts they interview. The situation exacerbates when journalists have to report on disagreements and controversies among experts. Journalism scholars thus tend to view reliance on experts as at least partly blind (Albæk, 2011; Ericson, 1998; Fishman, 1980; Tuchman, 1972). True, some journalists reach domain-specific knowledge that allows them to assess some expert arguments directly (Reich, 2012; Reich and Godler, 2016). Similarly, fact-checking organizations, which apply procedures akin to those of investigative journalism, occasionally try to adjudicate between experts (Graves, 2016). However, this is not the norm in routine journalism (Collins and Evans, 2008; Reich, 2012), and even journalists with technical command still fall short of actual experts.

Receiving claims from expert testifiers and trusting (or distrusting) them are social occurrences. Most journalists have only social means (e.g. impressions of and interactions with others) to decide in such situations, as they cannot assess the expert testimony directly. Can journalists, then, reliably trust experts or adjudicate between competing expert testimonies? Drawing on social epistemology, we cautiously argue that they can, at least in some cases. In a pioneering paper, Alvin Goldman (2001) describes several heuristics that can help a layperson decide between competing experts (papers that further develop Goldman's ideas include Collins and Weinel, 2011; Matheson, 2005 and Gelfert, 2011). If two experts are having an exchange, a layperson may not understand the respective arguments and evidence, but she can observe the experts' dialectical performance and evaluate who is doing better in the debate. If one expert offers evidence,

and her opponent does not manage to offer a rebuttal, a layperson can tentatively indicate who merits greater reliance. A novice can also evaluate the level of smoothness and quickness with which such rebuttals are offered. While this may be a problematic piece of evidence, because one expert may simply be a more skilled debater, we suggest that even without full grasp of the substance, journalists who know something about the fields they cover can discern lack of substance in debaters' statements or when a speaker employs empty rhetorical ploys.

Relatedly, in recent years, Israeli journalists faced a disagreement between experts regarding the effectiveness of the Iron Dome missile defense system, which was officially claimed to be highly successful in intercepting projectiles launched from the Gaza strip. The official view was echoed by an Israeli expert. However, an MIT expert begged to differ, claiming the success rate was extremely low.

Following this exchange between the experts, as Goldman (2001) suggests, is revealing. Regarding their dialectical performance, the MIT expert's claim about impossible interception angles was never rebutted by his counterpart. Journalists could also consult independent missile defense experts to adjudicate the claims or assess the debating experts' credentials and relative degrees of expertise. They could further check the experts' biases, and notice that the Israeli expert was long affiliated with the industry that had produced the missile defense system, whereas his MIT counterpart was not. Finally, Goldman recommends novices to examine the expert's track record (e.g. the veracity of analogous claims by the same expert about Patriot interceptors of Scud missiles during the Gulf War). Moreover, expert judgments sometimes have consequences observable by non-experts (e.g. the rate of destruction wrought). Because most Israeli journalists failed to heed these sources of indirect evidence, they can be found epistemologically culpable.

Group testimony: Journalists often rely on group testimony (or at least on testimony that purports to represent a group position) and group fact-finding efforts, when they report on the basis of committee reports and joint research projects. Like individual testimony, group testimony can be epistemically assessed by journalists. However, it involves additional challenges, such as determining whether the group testimony does indeed represent all or most of its members' views, or whether the group merely arrived at a compromise position for reasons other than obtaining or conveying knowledge.

A well-known case in the Israeli context will illustrate this point. In December 2008—January 2009, Israel carried out a military operation in the Gaza strip in which Gazan civilians died. A fact-finding commission headed by South African judge Richard Goldstone was established to investigate the international legal consequences of the operation and its broader context. Eventually, the commission reached a highly critical conclusion about the conduct of both Israel and the Gaza authorities. However, after roughly a year and a half, Goldstone, the head of the commission, publicly recanted from central conclusions in the report. Other members of the fact-finding commission strongly disagreed with Goldstone's sudden about face. Israeli and international journalists reacted by announcing the report unreliable. Abstracting from the particularities of this case, on what basis, if any, could journalists make such a claim?

Social epistemology points out several questions journalists may ask in order to epistemically assess group testimony. Does the commission report constitute genuine group

testimony, or is it a casual collection of different individuals' views? (Faulkner, 2018; Tollefsen, 2009) If the report constitutes genuine group testimony, did the commission try to get at the truth of the matter, or did it mask internal disagreements among its members in order to present a unified front? (Beatty, 2006). Did the commission implement critical discussion procedures and abided with knowledge producing epistemic norms? (Longino, 2002; Ch. 6) Does the report satisfy the conditions of a "knowledge-based" consensus? Particularly, is the report based on multiple converging lines of evidence? Is there relevant diversity among the commission members that rules out an influence of a bias shared by all members on its final report? (Miller, 2013, 2016).

In sum, social epistemology provides a variety of tools for epistemic assessment of testimony by journalists. The next section discusses technologically generated or mediated knowledge.

Technology-based knowledge in journalism

The growing use of new technological means in news reporting brings forth another form of knowledge mediation. Digital technologies provide greater transparency vis-à-vis journalists' work with documents (Mor and Reich, 2017), give rise to previously unanticipated forms of knowledge or semi-knowledge in the form of impressions (Nielsen, 2017), affect the assertiveness of the knowledge claims employed by online journalistic platforms subject to accelerated news cycles (Rom and Reich, 2017), and shift journalists' focus from hidden facts to finding patterns in overt and accessible (big) data (Coddington, 2015; Parasie, 2015; cf. Hermida, 2012). Recent scholarship has also asserted the existence of epistemological shifts in journalism. For instance, Anderson (2013) calls for future research to investigate the changing status of journalistic evidence in the face of computational journalism, whereas Carlson (2018) acknowledges an epistemic shift from journalistic to algorithmic judgment and focuses on the impact of this shift on how journalists legitimate their roles as cultural producers. However, none of this literature has systematically spelled out the preconditions under which information from a technological source *should* rise to knowledge.

In order to understand how social epistemology can flesh out the preconditions for technology-based knowledge in journalism, let us tackle the issue of the responsibility for failing to know, that is, the question of who is to blame when knowledge fails to arise. Drawing on Actor-Network theory, some authors describe technology as possessing agency (Anderson and De Maeyer, 2015; Domingo, 2008; Lewis, 2012; Schudson, 2015), thereby suggesting by implication that it can be held epistemically and ethically responsible (Latour, 2002). Whereas the idea that technology itself bears responsibility for knowing and failing to know remains controversial, the idea that the creators of the technology partake, alongside the end users, in the responsibility for generating knowledge is defensible. Consider the following social epistemological defense.

In the past, much of social epistemology assumed that there was no interesting epistemological difference between knowledge that arises from technological sources and knowledge that arises from natural or physical signs, for example, clouds or droplets on the windowpane as indications of rain, cigarette butts on the staircase indicative of a person being there some time before.[4] Nevertheless, a minority of social epistemologists

has discerned an important distinction between the knowledge that arises from such natural signs and knowledge that arises from technologies and instruments (Tal, 2014; Chang, 2007; Freiman, 2014; Kletzl, in press; Lynch, 2016; Miller and Record, 2013; Simon, 2010b). Whereas natural signs give rise to knowledge because of knowledge-seekers' familiarity with the regularities of the world, in the case of technologies there is a widely overlooked social component. The creation of a knowledge-bearing technology necessarily presupposes conscious beings (or "agents") who have intended for the technology to produce certain kinds of deliverances under particular circumstances.

In addition, the availability or lack of certain technologies changes effective standards of knowledge. This is because when a technology enables subjects to conduct certain inquiries that would be impossible otherwise, they may reasonably be expected to perform them in order to reach knowledge. Hence, new socio-digital technological systems, such as search engines, recommender systems, digital archives, and social networks, effectively change our existing epistemic standards. A knowing subject is an epistemically responsible subject, where the technology available to the subject plays a major role in delimiting her responsibilities (Miller and Record, 2013, 2017; Record, 2013).

At the level of the epistemic community, knowledge may similarly be said to be a collective view that is responsibly adopted by an epistemic community (Simon, 2010b). Collective acceptance or closure is achieved through processes that involve social and technological elements. Two architypes of closure are *integration* and *aggregation*. Integration refers to processes such as online discussions. It involves employing human judgment. Its final outcome is not known in advance, and it depends on the identities of those doing the integration. Aggregation is based on a pre-defined algorithmic or mathematical process of how to combine the different contributions, such as calculating a score for a movie from users' ratings. In both cases, only when performed responsibly, can communal closure be said to constitute communal knowledge (Simon, 2010a). In contrast, the *L.A. Times* experiment of enabling readers to revise its daily editorials wiki-style did not give rise to communal closure entailing knowledge, due to an inadequate relationship between the news corporation and its readers, who were not seen as authentic partners within a community of knowledge-seekers (Bruns, 2008).

Achieving knowledge, then, depends on the responsibility of the technology's creators and its end users, both journalists and readers. Yet laypersons, scientists, and engineers do not always reflect on the details of how the technology they routinely use to generate knowledge produces its outputs (Knorr-Cetina, 2009; Latour and Woolgar, 2013), and hence are arguably liable in those instances to practice blind and unthinking reliance on technological output. Specifically, journalists are often not privy to the details of how technologies were designed and through which causal mechanisms they produce their deliverances. However, this does not release them from the epistemological responsibility of gaining a general understanding of the preconditions that have to be met in order for the technology to produce reliable outputs. As Dahl (2017) argues, laypeople, journalists included, can to some extent evaluate the reliability of epistemic technologies. They can try to better understand how a technology works, rely on expert testimony regarding the technology, independently verify and crosscheck some of its outputs to establish its reliability, and draw on other users' testimonies. We now provide examples

of the questions journalists should ask about the technologies they rely on, even in the absence of a detailed technical understanding thereof.

In 2014, Schiffers, Newman and Thurman et al have introduced the Alethiometer (Schifferes et al., 2014), a then new technological means designed to help journalists assess the credibility of information encountered in the social media environment. The algorithm is based on the quantization and aggregation of users' credibility judgments, across a number of metrics. A 10-scale grading scheme is used, such that a negative result in any metric will be flagged as suspicious. Whether this is an appropriate measure of information's credibility or not, journalists' choice to rely on such a tool would presuppose trusting the algorithm creators in conventionally identifying users' credibility judgments with credibility per se. It would also entail journalists' accepting the antecedent assumption that credibility judgments can be quantified in accordance with the creators' grading scheme. The same concern would apply to reporters relying on fact-checking algorithms programmed to draw on extant verdicts of fact-checking organizations (Graves, 2017)—organizations whose mechanisms for certifying facts are "always open to question" (Graves, 2016: 165).

Despite extensive interest in computational journalism and the incorporation of big data analysis into some forms of journalism (Anderson, 2013; Appelgren and Nygren, 2014; Carlson, 2018; Fink and Anderson, 2014; Karlsen and Stavelin, 2014; Parasie, 2015; Parasie and Dagiral, 2013), very little attention has been devoted to the epistemological standards of journalists who use these new technological innovations (Anderson, 2013; Parasie, 2015; Parasie and Dagiral, 2013). Even when such attention has been paid, however, the research explicitly eschewed a normative assessment of journalists' standards (see Parasie, 2015: 365; Parasie and Dagiral, 2013: 863). Still, Parasie and Dagiral's (2013) and particularly Parasie's (2015) research is one of the few instances when epistemological practices and standards of computational journalists were described in a detailed and illuminating manner. From these descriptions, valuable insights can be extracted about how journalists can responsibly assess the epistemological performance of tools which are not easy to unpack without close familiarity with their technical features.

Thus, Parasie (2015) describes an investigation by the *San Francisco-based Center for Investigative Reporting* (CIR) into state regulators' adherence to earthquake safety laws for public schools, which involved the use of big data analytical tools. It constructed a database of schools located in seismic hazard zones. Constructing the database proved to be a challenge. Originally based on three sources of data (the government agency which sent the data, a geological institute, and the department of education), and subsequently supplemented with additional ones, the data turned out to be quite messy. School names across different data sources did not match, plenty of misspellings and so on. Thus, to validate the emerging database, the investigative reporter collected qualitative data, such as interviews and documents and juxtaposed those against the figures included in the database. Eventually, a consilience of data was beginning to be achieved. What the data analyst was now seeing in the data, the investigative reporter was seeing in his documents and interviews. Only from that point on did the confidence in the database stabilize.

Restated in terms of the above analysis, the individuals involved—both the investigative reporter and the data analyst—did at no point blindly trust in the deliverances of the database. Rather, the deliverances were juxtaposed against data from other sources before the database could be fully trusted. This is precisely what a social epistemologist would advise in situations akin to the one Parasie describes. Nonetheless, because Parasie (2015) places knowledge claims' validity outside the scope of his research, the relative epistemological superiority of the validation procedure he describes compared to a hypothetical scenario wherein such a procedure was omitted, does not shine through.

Conclusion

Social epistemology can serve as an effective new knowledge paradigm for journalistic fact-finding and as a mutual philosophical and normative agenda that both scholars and journalists can agree on. Social epistemology offers the best of both worlds: a thorough familiarity with biases and failures of obtaining knowledge, and a strong orientation toward best practices in the realm of knowledge-acquisition and truth-seeking.

Whereas extant journalism scholarship has emphasized journalists' tendency to refrain from adjudicating factual questions, our social epistemological approach demonstrates a clear path to such an adjudication. The scholarly literature we have reviewed is replete with documented instances of journalists stopping short of determining, for instance, which of two sources is telling the truth (e.g. Ericson, 1998; Fishman, 1980; Tuchman, 1972). While we do not expect journalists to aspire to adjudication in all instances, the explicit social epistemological heuristics we have offered illuminate a clear way out of journalists' routine knowledge-related dilemmas, at least when they seek and have the opportunity to resolve them. The perspective we offered also allows contemporary journalism scholars to distinguish valid from invalid reliance on technology in the course of journalistic knowledge-acquisition. To repeat, prior to our theoretical intervention even the detailed description of Parasie (2015) did not acknowledge the epistemic superiority of the technology-based knowledge-acquisition practices he documented.

Reciprocally, social epistemology can now benefit more systematically (see Cox and Goldman, 1994) from the empirical richness afforded by existing studies of journalistic knowledge-acquisition practices and subsequent studies of journalism explicitly inspired by social epistemological concerns. Think, for instance, of journalistic reliance on routine and non-routine sources. Much has been written about this (Ericson, 1998; Fishman, 1980; Gans, 2004; Sigal, 1986; Tiffen et al., 2014; Tuchman, 1972), but journalists' rationales for such reliance have never been subjected to the social epistemological analytical criteria we outlined above. A more contemporary concern would be the standards by which journalists choose to rely on information from databases, algorithms and social media. Such rationales and standards can be recreated in detailed interviews, and then subjected to social epistemological scrutiny. For instance, do journalists rely more readily or frequently on retweeted information and if so, is such a reliance justified? Future research may examine how the knowledge standards of investigative journalists differ from those of straight news reporters in a way which does not only document these standards (as some studies have done, see Ettema and Glasser, 1985, 1998) but also

evaluates them. Likewise, the comparison and critical scrutiny of epistemic standards could be extended to citizen journalists, bloggers, user content and news audiences (Coady, 2011; Goldman, 2008; Munn, 2012). Finally, social epistemology is useful for understanding plagiarism, aggregators and inter-media agenda-setting. All of these phenomena raise questions about the proper conditions under which media may legitimately rely on other media.

Funding

Notes

1. Tuchman (1972) states this explicitly after endorsing Schutz's conception of taken-for-granted knowledge (p. 675).
2. The justified true belief account of knowledge has been famously challenged by Gettier (1963), but Gettier's challenge is irrelevant to the concerns in this paper.
3. Bhaskar's (2013) work, for instance, offers penetrating insights into the ontological (including social) preconditions of knowledge-acquisition, but leaves the determination of epistemological standards to the work of substantive knowledge-seekers (in particular, to scientists themselves).
4. See Goldberg (2012) for an explicit argument to this effect; in his 2017 paper, however, Goldberg retracts from this position, and distinguishes natural objects from designed artifacts.

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