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ARTICLE



Robots in the News and Newsrooms: Unpacking Meta-Journalistic Discourse on the Use of Artificial Intelligence in Journalism

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ABSTRACT

As journalism has grappled with the potentials and boundaries of AI within the industry, journalists have produced plentiful articles detailing experimentation and potential consequences of AI-driven journalism (see, Peiser, 2019; GPT-33, 2020). Accordingly, this article analyzes media coverage ($N = 95$ articles) of AI in journalism over a 5-year period, starting in 2016 and ending in 2020, to examine prominent themes related to uses, roles, and concerns regarding AI in the newsroom. We sample coverage from 20 US and UK news media outlets representing a diversity of media with regards to media type and partisan leaning. We employ a thematic analysis on the media coverage of AI as it relates specifically to its use and application in journalism. Our exploration uncovers a tension between the industry and profession of journalism in highlighting the hopes and pitfalls of AI. It also allows for a discussion on assessing the place of AI in news making, especially with regard to the economic and contextual complexity in which news stories operate and the normative ideals of journalism in the digital era.

KEYWORDS

Journalism; artificial intelligence; meta-journalistic discourse; normative ideals

Journalism has continuously been forced to adapt to conditions of rapid social, cultural and technological change (Lewis and Usher 2016). Economic instability has forced the industry to embrace technological innovation as a route to survive within an increasingly competitive digital media and information environment (Usher 2014; Shoemaker, Vos, and Reese 2019). It is within this context that artificial intelligence (AI) technologies have made inroads into the practice of journalism, shifting the production, dissemination and consumption of journalistic output. As applied to journalism, AI can be conceptualized as a series of algorithmic processes which produce and disseminate text and images (including videos) for public consumption usually with little human oversight (see Carlson 2015a). Consider the case of GPT-3, a software developed by OpenAI which promises to challenge the human labor of writing¹. GPT-3 is a “third-generation auto-regressive language model” which produces human-like text

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using deep learning (Floridi and Chiriatti 2020). Despite arguing that AI may “challenge” human journalists, it is important to note that AI—from its creation to its implementation and sustainment—requires human labor, though the extent to which this labor is considered under the umbrella of “journalism” requires unpacking, and is a source of contention within the increasing use of technology in the newsroom.

While AI may open up significant avenues for journalistic research and reporting (see Hansen et al. 2017), such technologies are far from neutral. Media coverage has highlighted ethical issues and other negative consequences (ranging from privacy to inefficiency) associated with a range of digital technologies such as algorithms, facial recognition, machine learning and artificial intelligence (Fast and Horvitz 2017; Sun et al. 2020). Further, academic exploration of the use and consequences of digital technologies has documented similar drawbacks within its journalistic use. A 2017 Tow Center report, for example, calls for the development of shared guidelines amongst journalists and technologists to ensure the ethical use and deployment of AI in the newsroom (Hansen et al. 2017).

Moreover, public imagination of AI has been altered by popular fiction, in particular science fiction’s depiction of artificially intelligent technologies. For example, the Royal Society’s AI Narrative Project highlights how characters like Star Wars’ C3P0 and T-800 from the Terminator franchise, have projected a sense of anthropomorphic embodiment onto AI that impacts how the public perceives utility, dangers, and the limits of available technology. The resulting picture of the utility and consequences of AI, particularly in its use within newsrooms, is thus muddled, raising questions as to how journalists view their place, industry and the broader journalistic landscape as being impacted by automated technologies.

Debates around the use of technology within newsrooms are embedded in broader conversations about the role and efficacy of journalism itself. Thus, optimism and critique of technological tools sits within wider debates about the boundaries and boundary objects of journalism—how do these technologies advance or hinder a particular normative vision for journalism? While there exists significant academic conversation about the use of AI in newsrooms (Broussard et al. 2019; Carlson 2015a; Lewis, Guzman, et al. 2019; Stray 2019), there exists a dearth of empirical research exploring the coverage of AI *in journalism* by journalists themselves. This meta-journalistic conversation is increasing, and visibly portrays how journalists are publicly grappling with an uptake in automated technologies and AI in all industries, but especially their own. We argue that exploring metajournalistic conversation offers routes to understanding the gaps in our normative understanding of technology’s rightful role in the newsroom. Journalists writing for public audiences may be cautious in how candid they are willing to be about AI’s role in journalism—especially in light of fears that AI may further undermine their shaky labor conditions. However, the public orientation of this discussion necessitates that journalists attend to how automated technologies and artificial intelligence may contribute to, or take away from, journalism’s public responsibilities.

The coverage of AI in journalism, by journalists themselves, offers perspective on how journalists see the boundaries of journalism as being altered by external technologies such as AI. In particular, we explore how the artificiality (or more pointedly, the

lack of humanness) of AI challenges core notions of journalism—what journalism as an act (or set of actions) entails, what makes someone (or something) a journalist and what separates journalism from other forms of information. We thus argue that debates over the use of AI in journalism often highlight more existential crises of the rightful place of journalism in the digital era.

The following literature review highlights the historical trajectory of technology use within journalism that has culminated in ongoing debates around the use and ethics of using AI within the newsroom. In order to explore journalists' public-facing perceptions of how AI is altering their profession this article analyzes U.S. and U.K. media coverage of AI in journalism over a 5-year period from 2016 to 2020. The subsequent analysis connects the emergent themes from media coverage with broader normative conversations surrounding the ideal role(s) of journalism, its relationship with audiences and changing definitions of who (or indeed, what) is a journalist.

Fear, Anxiety and Technological Determinism

Journalistic anxiety over technology is longstanding and, given the upheaval of the profession through digitization, not entirely unfounded (Spyridou et al. 2013; Bui and Moran 2020). Part of the discussion over the role of AI in the newsroom can be attributed to so-called “automation anxiety” (Linden 2017)—fear of technology's “job-killing effects” (Akst 2013, p. 1). Technological advancement brings into the newsroom novel practices demanding new technical skill sets, new job roles and causing actual or feared employment shifts that alter who gets to practice journalism and how (Paulussen 2012).

Complications within journalistic reactions to technological innovation arise precisely because the uses and outcomes of technology within the newsroom are mutually shaped by journalists and technology. Work by Anderson (2013) on the rise of “data journalism” highlights how the use of algorithms and big data are a combination of “human intentionality and material obduracy” (2013, p. 1016) meaning that technology both shapes and is shaped by the existing cultural practices of journalism (Carlson 2015a). Resultantly, technology is not simply an external tool journalists are forced to assimilate into newswork (though the drive for technological innovation is often fuelled by funders and external actors) but is instead a tool shaped by journalistic practices, needs and norms that similarly alters, sometimes dramatically, everyday newswork. However, the top-down decision-making processes that occur within the newsroom often mean that initial decisions to implement AI are not made by journalists on-the-ground but by funders, editors and managers. As such technology appears as an inevitability to journalists, fuelling a sense of technological determinism despite the realities of technology being increasingly shaped by, and designed for, journalism.

Making Sense of Existential Crises of Humanness

In order to make sense of the novel relationships technological innovation brings into the newsroom, academics have advocated for a sociological approach to research that—though recognizing the uses and affordances of technology—advances broader

lenses of study (Anderson 2013). These lenses attempt to capture economic, political, cultural, organizational, technological and field perspectives that afford insights into how technology reifies and challenges definitional and practical boundaries of journalism and its normative orientations. This is especially pertinent in contending with the application of artificial intelligence within journalism as its “intelligence” and automation represents a different development that challenges core notions of journalistic labor. As Van Dalen (2012) argues, “journalistic labor has traditionally been defined on the basis of the people who do the work and the skills they possess. The idea that journalistic tasks can be completely automated clashes with our general understanding of the nature of journalism (2012: p. 649; see also Örnebring 2010) The resulting meta-journalistic conversation situates the imposition of technology as cause for existential dilemma—as Van Dalen asks, “Which tasks will be automated while others remain the domain of human journalists? Which are the core skills that define journalistic labor?” (2012, p. 649). Put differently, what about journalism is undeniably, and irremovably, human? While technological innovation within the newsroom has historically been met by journalists by a reskilling to expand the role’s necessary competencies, artificial intelligence represents a fundamental challenge by automating (and outperforming) journalists on tasks such as big data analysis and processing and even, as the technology expands, writing.

Such changes exist as continued evidence that the boundaries of journalism are fluid and contested (Lewis and Usher 2016; Carlson and Lewis 2015). Numerous journalism scholars have written on the porous boundaries of journalism and its openness to interlopers or “strangers” (Gans 2007; Eldridge 2019; Belair-Gagnon and Holton 2018; Carlson 2015b). This fluidity allows boundary crossers to bring into journalism different objects, tools and practices that not only allow journalism to survive within continued precarity but similarly contests the definitional control journalists have over their own profession (Tandoc Jr., 2019). Looking to Science and Technology Studies (STS), journalism scholars have sought to explain contestation and change with journalism in terms of “boundary work” (Gieryn 1983)—“symbolic contests by which different actors compete for definitional control, allowing them to apply or remove certain labels, or otherwise establish authority over a social domain” (Lewis and Usher 2016: 545). Within this boundary work exists discussion over “boundary objects” (Star and Griesemer 1989)—material and immaterial meeting points that retain a plasticity of meaning that allows for them to act as meeting points for distinct groups who individually maintain particularized frames of reference towards them.

Discussions of boundary objects within journalism are especially germane in light of technological innovations that bring into the newsroom new actors (or “interlopers”) who relate to journalism’s boundary objects differently. AI represents a further challenge to this as it cements trends in automation that bring non-human actors into boundary contestations. How journalists perceive the utility and consequences of AI is thus a consequence of the technology itself and how its imposition challenges or reifies journalists’ understandings of the core boundary objects that give their profession legitimacy and authority.

Accordingly, artificially intelligent technologies, or AI, can be usefully conceptualized as a “boundary object” following the tradition of journalism scholars of approaching technological artifacts and tools as spaces of collaboration and negotiation. The implementation of artificially intelligent technology within newsrooms is not simply the

introduction of a professional tool that increases “productivity”, instead it exists as a “boundary object” around which different actors meet, negotiate proper role and use, implement individuated agendas and more.

Extending the Normative Dimension: Media Coverage of Artificial Intelligence

Journalism studies on AI highlight the power of media to frame public debate, particularly around topics like AI that require significant technological knowledge bases that are not typically held by the general public (Shaikh and Moran 2022). Moreover, journalist’s perspectives on AI more broadly, filter into perspectives of the potential for AI in their own industry, and the ethical, social and future-related considerations these technologies invite. It is therefore useful to look at journalistic discussion related to AI in order to connect together border opinions of AI, more particularized sentiments of the role for AI within journalism and the changing role of journalism itself.

Much discussion of AI in journalism, as previously highlighted, comes out of whitepapers and foundation reports produced by philanthropic, academic and professional organizations associated with journalism (see Cheung 2019; Reuters Institute 2019; Renner 2017). AI is often positioned as a savior for journalism—providing tools to streamline the research and writing process, freeing up journalists for more intensive and creative journalistic work (World Economic Forum 2019). While predominantly solutions-oriented, these specific conversations also consider the ethical and labor consequences of AI including the potential for AI-enabled journalism to (in the absence of direct human oversight) proliferate misinformation (Micklethwait 2019). What is missing from these conversations, however, is a normative examination of how the deployment of AI may fortify or alter dramatically the boundaries of journalistic work, of the professional identity of journalists and the relationships between journalism and its audiences. In order to gain insight into these normative dimensions we argue that it is necessary to look to meta-journalistic discourse produced by journalists themselves. An exploration of how journalists cover the story of AI in their own industry offers a novel perspective of the perceived utility and limitations of the technology, in addition to a richer account of the power dimensions and normative consequences that reverberate across the institution as AI proliferates. Accordingly, this article explores media coverage of the use of AI in journalism through the following broad questions;

RQ1: What uses of, and roles for, AI in the newsroom do journalists highlight?

RQ2: What concerns of AI in the newsroom do journalists highlight?

Method

Data

As a starting point, we focused on English language publications from the U.S. and U.K. in this study. We focused on these geographical domains as the development and deployment of AI in journalism and surrounding legal (see Lewis, Guzman, et al. 2019; Wiley 2021) and technical debates (Brown et. al. 2020; Dale 2021) are flourishing

in this part of the world primarily due to the presence of technology companies which develop AI.

We started with a list of 20 prominent media outlets in these countries. Our selection was based on these outlets' circulation and/or viewership and their industry reputation (see Pew Research Center 2019). In addition to accounting for outlet prominence, we sought to cultivate a representative sample that reflects the ideological diversity and variety of media types (e.g., digital native, digital first, and traditional print-first outlets) existent within the U.K. and U.S. media systems (see Table 1). We paid emphasis to including media of diverse types and partisan values as partisan leaning has been found to be an influential factor in how news media covers AI (Shaikh and Moran 2022; Brennen et al., 2018). Further, given the complexity and networking of offline and online media sources within media audience's daily information diets it is pertinent to expand academic exploration to include novel digital outlets.

We used a combination of the following search terms on LexisNexis, Google News, and within each publication included in the study to retrieve relevant articles published between January 2016 and December 2020: "journalism", "algorithm", "bot", "robot", "reporter", "AI", "artificial intelligence", "automation", "automated", "OpenAI", "reporter", "journalist", "machine learning", and "GPT-3". Each article must have met at least one of the following two conditions to be included in the analysis: a.) It must discuss the application or use of AI and/or automated technology in journalism and b.) it must focus on the use and effects of said technologies by and on journalists. We removed any data which did not meet our inclusion criteria which rendered a total of $N=95$ articles taken from 19 publications (Table 1)² for analysis.

Thematic Analysis of Media Coverage

To analyze the collected data and answer our research questions, we used an inductive process to generate a codebook of emergent themes. Our methodological process rested on conducting a thematic analysis which aims to unpack qualitative data to unveil the thematic patterns and structures which underlie a sample of interest (in our case, articles from media outlets) (see Braun and Clarke 2006).

Thematic analysis is a recursive process which requires coders to engage with their data repeatedly to extract themes that can best provide rich and nuanced qualitative assessment of the data (Braun and Clarke 2006). For this study, coders read through newspaper articles and kept memos of emerging narratives. Coding was done on an article-level basis, with researchers highlighting appropriate sentences and/or paragraphs (to develop initial codes) and attaching relevant themes. After open coding an initial subset of the data separately ($n=15$), two coders met to discuss emergent themes and compare memos. From these discussions coders produced a finalized coding scheme that was then applied to the broader sample. Researchers then coded articles separately but met regularly to discuss coded data and iteratively review the resulting analysis.

The finalized thematic coding scheme yielded nine emergent themes which coalesce around three overarching categories that aid in answering our research questions; (1) normative considerations of how AI impacts journalism as an institution and

community of practice—including thematic codes such as “inevitability of technology” and “importance of human journalists” (2) practical considerations of how AI impacts the role and job security of journalists—emerging from themes including “job insecurity” and “AI as merely a professional tool” and, (3) holistic considerations of how AI alters producer-audience relationships—including themes of “fears of audience deception” and “technologically driven sensationalism”. Our goal was to provide readers a rich understanding of the emergent themes and how they relate to our research questions. In the following sections, we expand upon these themes and comment upon our findings.

Findings

1. Changing Journalism in the World of Robots: The Profession and the Industry Divide

The first set of emergent themes yielded from our analysis focuses on what the incorporation of AI means for the profession and industry that is journalism. Given the nascency and indeterminate nature of AI, opinions around the potentials for AI in journalism are far from monolithic. Instead, coverage highlights colliding, distinct, and often competitive stances on the inclusion of AI in journalism.

a. The Inevitability of Technology, Cost, and Human Labor

In the main, coverage of AI tends towards seeing technological change as an inevitability. Underpinning the inevitable is a view by industry leaders and funders that AI could be a savior for journalism as it battles within a hyper-competitive and economically shaky attention economy. AI is touted as a panacea for managing the complications of a quickly growing (and increasingly attention-limited) audience by allowing for the production of a “huge number of automated stories about niche or local topics” (Keohane 2021). In addition to, or perhaps justifying, visible economic incentives (AI can do more, for less cost), coverage claims that a push for AI in journalism is also predicated upon maintaining and improving key journalistic parameters such as timeliness, efficiency and accuracy. For journalism to be valuable it must be able to make timely interventions into breaking stories while also sustaining accuracy. It is understandable that in the era of dwindling revenues and cost-cutting it is in the interests of the industry to incorporate technology that best allows them to balance efficiency and quality in economically judicious ways. Accordingly, prominent within coverage is an economic justification of the use of AI. For example, an article published by *Metro* suggests: “AI can replace humans rather than sit alongside them because they’re cheaper, don’t take sick days or holiday and require minimal oversight” (Parsons 2020).

However, protests against this logic similarly emerged, with a cohort of journalists convinced that prioritizing economic efficiency through AI threatens journalistic labor. Journalists argue that AI is not merely code that exists without human input. In fact, human labor is often ignored within the discussion on using AI for cost-cutting —“As so often, what is promoted as a magical technological advance depends on appropriating the labor of humans, rendered invisible by AI rhetoric” (Poole 2019). The

argument, made by Steven Poole of *The Guardian*, also signals to the fact that data managers, coders, and developers of technology which “feed” data to algorithms are arguably also engaged in journalistic work. Yet, their names do not appear in bylines and thus they remain invisible not only within the industry but to the profession and by extension, to audiences. AI brings into the newsroom novel labor—distinct from traditional journalism—but similarly rendered invisible by a prioritizing of economic productivity through automated technology. This speaks to further normative conversations over the boundaries of journalism as journalists grapple with the definitions of what constitutes journalistic labor and, more broadly, how the economic survival of journalism (through personnel cuts and heightened automation) may entail a reshaping of the normative orientations of journalism.

b. Anthropomorphized Machines and Irreplaceability of Humans

Interestingly, in reckoning with how automated technologies may challenge human labor and necessity within journalism, many journalists reinforce an anthropomorphism of technology by using descriptors which are typically associated with humans. For instance, Forbes introduces bots called “Bertie”, “Heliograph”, and “Cyborg” as the “new *journalists* [italics added] on the block” (Dans 2019). Referring to bots as “journalists” may be a strategic framing used to make AI legible, or indeed palatable, to readers as newsrooms cut costs and churn content at a rapid pace. In order to ensure that the AI journalists are accepted and receive sustained interest from the audiences, it is useful that audiences see it as comparable to “human” journalists. This goal can be accomplished by radically anthropomorphizing machines to make them acceptable replacements of humans.

Industry-led attempts to position AI as a “human” actor within the newsroom once again results in a schism within coverage wherein some journalists pushback against attempts to automate their hard-fought profession. A profession is one’s personal and social identity often morphed with years of education, training, and practice. Although professionals are embedded in the industries they work for, the two are not mutually inclusive. A professional’s claim to a rightful place in any industry is the uniqueness they can bring to the table in terms of aptitude, skill, experience, and judgment. Over the course of the past three centuries, journalism has been conferred the status of a “profession” distinct from other literary occupations (Tumber & Prentoulis 2005) where its practitioners bring distinct contributions to the table. Thus, journalists are acknowledged as a class of professionals unto their own without having to justify their status (see Deuze 2005).

However, as AI becomes a journalist (of sorts), journalists have been forced to defend their utility and professional necessity in the face of the threat of industry-wide automation. The core argument journalists advance within coverage of AI rests on the idea that journalism requires a core “human” element—manifested within the emotions and creativity of professional journalists—which machines, no matter how anthropomorphized, cannot have. This is exemplified within Metro coverage, for example—“I want human input with human emotion and human writing. Humans will always win out over computers when it comes to creative judgment and lateral thinking. Always.” (Parsons 2020). In sum, coverage highlights an internal conflict between

the profession and industry of journalism wherein the industry (in particular funders of journalism) attempts to anthropomorphize technology to justify its utility beyond mere economic efficiency and journalists who counter by arguing that *human journalism* is unique and irreplaceable by automation.

c. Content as Journalism? The Gap between AI and Humans

In addition to highlighting schisms within journalism over industry priorities and professional identity, the coverage of AI similarly highlights contestation over the core service of journalism. Notably, conversations around the necessity of AI are framed around debates of whether journalism is the production of “content” or something more. In the digital era “content” refers to material whose primary purpose is to catch a user’s ever-fleeting attention only to be rapidly replaced by another piece of content. Content creation is a labor-intensive and continual endeavor where producers focus on making the most out of the *attention* and *time* a consumer might give them in an information saturated digital space. Thus, content is the life blood of the attention economy.

AI is positioned as a tool to aid in this battle for relevance in the attention economy. As highlighted in coverage by Vox, Former Chairman of Tribune Publishing Michael W. Ferro Jr. argued “Right now, we’re doing a couple hundred videos a day; we think we should be doing 2,000 videos a day” BuzzFeed Motion Pictures, for comparison, reportedly makes around 65 to 75 videos per week, (Kulwin 2016)—the article then positions AI as a potential route to achieving higher production. Also in 2016, Newsweek published an article on a “prolific robot journalist” called Xiaoming who wrote stories for the news syndication service Toutia and produced 450 stories during the 2016 Rio Olympics delivering news within two minutes of the sport event’s ending (Cuthbertson 2016).

Such a development, and its justification as a vital improvement to journalism, begets the question: is journalism merely the production of “content” or is something more valuable? Schisms within the coverage of AI journalism highlight an increasing conflation between content and journalism — cemented by the economic needs of industry. In an interview with *The Intercept*, Ken Doctor, an analyst with the *Nieman Lab*, said of AI: “The problem is the tools are being used by those who are primarily looking at cost-cutting” he said “actual journalism requires judgment” (Reynolds 2019).

Accordingly, there exists a tension emergent from coverage of AI in journalism between seeing journalism as the provision of content, and thus seeing AI as a welcome aid in efficiently producing content, and in seeing journalism as much more than the fast turnaround of AI-driven stories. To some journalists, AI-written stories symbolize blunt calculations devoid of the context required to reach the truth. For instance, lamenting AI’s distortion of “reality”, *New York Times* write Steyerl argues; “To artificially stupid automatons and algorithms, reality is defined as brute quantity, by ranking, ratings and elimination. The truth doesn’t fit into that mold. The truth is a piece of work with unruly and messy details that nevertheless require attention and never fully add up.” (Steyerl 2018).

2. Robot versus Journalist

The second overarching theme emerging from analysis focuses on AI's effect on, and relationship with, journalists.

a. The Machine Takeover

Prominent within coverage is a fear that journalists will lose their jobs to automation. In an article in *The Independent* on the future of journalism and AI one journalist questioned: "Will artificial intelligence put journalists out of work?" (Rentoul 2020). News coverage illuminates how this question is plausibly prescient of times to come for journalists. For example, in 2020, Microsoft fired 27 journalists on its payroll as it replaced them with AI software to maintain news homepages (Waterson, 2020). In order to protect their labor, journalists call for a focus on technological skill development and growth in the industry. Journalists have become keenly aware that in order for them to stay relevant in the industry, they must learn new skills to keep up with the pace of technological development. "The availability of increasingly powerful tools should be a wakeup call to journalists to acquire the skills to take advantage of them to the limit — or to push those limits — and to learn to do things that were not possible even a few years ago". (Dans 2019). In order to counter some of the broader changes to journalism highlighted in the previous section's analysis, journalists must remain central to the newsroom, and thus advocate for an upskilling to protect their position within the industry and their ability to shape what journalism is.

c. AI: "Tool" or Liberator?

Building on this upskilling, advocates of AI in journalism argue that the technology can actually assist journalists in doing more "serious" work. This idea mostly emerges as a justification to assuage fear surrounding automation of jobs. While introducing Heliograf, a robot reporter to the public, *The Washington Post* claimed: "We are not trying to replace reporters ... We're trying to free them up" (Kafka 2016). In the same vein, coverage in *The New York Times* argues that "(AI) is not a threat to human employees. Rather the idea is to allow journalists to spend more time on substantive work" (Peiser, 2019). In this sense, AI is pitched as a technological liberator of journalists which can untether them from clutches of menial tasks that deprive them from producing quality work.

Some brand AI as a "tool, not a replacement" (Kobie 2018) which can help journalists do more serious and creative work by saving time and energy. Many journalists find sense in this idea and suggest that "maybe we'll be able to push ourselves in interesting ways as the AI becomes a partner or tool to extend our own creativity. AI can help us behave less like machines and more like creative humans" (Samuel 2019). However it is not clear from coverage what is meant by "creative" and "substantive work" and how can AI *exactly help* journalists achieve it? Consider the following hypothetical scenario presented in a *Forbes* article: "Imagine how productive Woodward and Bernstein might have been if only they had robots to write their articles for the *Washington Post*. With a little A.I. on their side, they might have taken down Nixon in days instead of years" (Sahota 2018). Such a statement may be controversial to

journalists—Watergate being one of the cornerstones of journalism’s ideal democratic orientation. The author, however, fails to fully explain how AI would actually serve to enhance investigative reporting, or why an expedited timeline for completing stories works to better achieve the normative goals of journalism.

d. The Writing Competition: Journalists’ Perceptions of Machine Story-Telling

Finally, in grappling with the rightful role for “robots” in the newsroom and how journalists may need to reskill to retain their superiority in the competition between man and machine, journalists look to illuminate their own superior (and very human) skill sets. Commenting on the GPT-3 article produced by the *Guardian*, *Metro* highlighted the application’s poor writing: “The pacing isn’t good enough, there’s too much repetition and the syntax skews towards youth rather than experience. I’ll give it a C+” (Parsons 2020). Similarly, words such as “formulaic” (Marr 2019) and “mediocre” (Piper 2019) are also used to describe AI’s story writing abilities. By virtue of these limitations, some have gone on to claim that it doesn’t seem “remotely possible” that a computer will take over a journalist’s job (Manjoo 2020). These critiques further cement friction within journalism over the proper definition of what the outcome of journalism is, the practices and skills required to produce this outcome, and the type of actor that can claim to be a journalist.

Requiring further attention is the stability of boundary claims given the innovation of AI technology. Assignments of mediocrity (which may assuage journalists’ fear of replacement in the short-term) may not hold as AI advances. Coverage by *Forbes*, reckons with this future insecurity— “For a long time conventional thinking held that A.I. is not yet capable of creative work, the kind of thought to be associated with generating news articles or movie trailers. This just isn’t true and therefore deserves our attention” (Sahota 2018). While journalists cling to creativity and contextual knowledge as skill sets endemic to human journalists, there exists a creeping recognition (perhaps also driving calls for upskilling) that AI may advance beyond what is currently expected of it, and this may result a power shift in the newsroom wherein AI is no longer a tool of assistance but a competitor.

3. Audience Recognition of the “Robot Reporter”

The third overarching theme is concerned with audiences of journalism. We expand themes pertaining to journalists’ perceptions of audiences’ relationship and understanding of AI.

a. Can We Distinguish Humans from AI?

Journalists are concerned over whether audiences would be able to distinguish stories written by AI as the technology becomes more sophisticated and widely deployed. “If computers can produce large amounts of text, how will we ever be able to tell humans and machines apart?” (Manjoo 2020). Lamentations such as these often preface their concern by referring to technology-produced writing as “synthetic” and

something apart from the “real thing” (Pagnamenta 2020). The concerns explicitly suggest that the writing produced by AI is not “real” and is thus of lesser quality, and may even be problematic. But what constitutes “real” journalism? In cultural and social parlance with respect to technology, “real” retains deeper meanings of authenticity, truth and naturalness. The quality of being “real” can only apply to artifacts produced by humans. By being inanimate, machine-produced content cannot be real.

Coverage of AI therefore suggests that readers *must* know if an article is produced using AI so they can properly assess the information they receive from this piece of journalism as it does not exhibit the “real” qualities of human-produced journalism. The dominance of concerns over reality and authenticity are explicitly tied to issues of misinformation and “fake news.”

Journalists are concerned with the flooding of the digital sphere with fake news by machines who can obviously churn massive amounts of content in very little time (Pagnamenta 2020). Here too, the *perceived* limitations of the audience’s judgment of what is real and fake is apparent. AI therefore represents a threat to media-audience relationships by further implicating journalism within information disorder.

b. Algorithm-Driven Sensationalism

Building on concerns that AI may exacerbate misinformation, some worry about the role technology plays in spreading sensational news content for the sake of clicks and how that transforms media’ relationships with the audience. One such example highlighted within the sample data was the “crisis actor” false narratives that dominated the top trending videos on YouTube following the Parkland school shooting (Arkin and Popken, 2018). Journalists illuminated such incidents as examples of how existing automated technologies—such as top trending algorithms—reward sensationalism, clickbait and often misinformation. Concerns abound, therefore, of how automated technologies may result in the same trend-seeking behavior within written journalism, and the negative impact this may have on audience relationships. Again this is notable as it highlights how these technologies exist as boundary objects within journalism, with some actors seeing their existence and role in the newsroom as one of utility, and others seeing technological interlopers as exacerbating the worst tendencies of journalism, eroding audience trust over time.

Discussion

In this study, we analyzed US and UK media coverage of the use of AI in journalism over a five-year period to answer the following research questions: a.) what uses of, and roles for, AI and b.) what concerns of AI in the newsroom do journalists highlight? In our analyses, we found a tension between two sides of journalism—the industry (primarily newsroom leaders and funders) and the profession (journalists)—that results in the emergence of contrasting narratives on the deployment of AI in newsrooms where the former focuses on the uses and roles of AI in journalism and the latter delineates their concerns about technology. Primarily driven by economic and utilitarian motivations, AI advocates paint an overall hopeful picture of AI in journalism as the technology promises

to cut costs and produce large amounts of content to grow and sustain audiences. Interestingly, the industry frames AI as both a human-like entity by using descriptors such as “journalists” to make it more palatable to a potentially critical or inexperienced audience (see Zhang and Dafoe 2019). Further, to placate the concern that AI is going to create job losses, advocates also brand AI as a “tool” which can help journalists do more substantive work by freeing up their time.

While the industry pitches technology as something useful and long-term, professional journalists tend to highlight more concerns surrounding AI. “Automation anxiety” is recurring as journalists fear that the technology will kill their jobs (see Akst 2013; Örnebring 2010). Additionally, they criticize AI-generated text as being poor in quality and not “real” journalism—tied to a belief that machines cannot match human creativity and judgment. Journalists also believe that audiences would suffer as a consequence of having AI doing journalism as they would be mostly unable to distinguish between human and AI writing while navigating the complex web of bot-generated fake news. While all of these concerns may have validity, they also appear as defensive attempts by journalists to keep their now threatened place in an industry that is keen to deploy AI across a variety of journalistic settings.

Although the current exploration highlights several uses, roles, and concerns of technology brought to the fore by industry executives and journalists on the ground, a discussion pertinent to the *optimization* of journalism through technological innovation is largely absent from the discourse produced on AI for journalism. For instance, the coverage analyzed thus far does not comment on editorial responsibility—a key component in all journalistic endeavors—in the age of AI. Journalists’ relationship with their audiences is a product of a complex web of editorial standards and practices. In theory, a journalist’s work is supported by the publication and editors who also bear responsibility for the content their employees produce. As applied to AI, the reputational dynamics that affect journalists and editorial responsibility still remain undiscussed in the coverage of AI in journalism. Arguably, the inclusion of AI would change the acceptance and delegation of moral and professional responsibility editors make in everyday newsroom decision-making. How, when, and to what extent would the “algorithms” be responsible for positive and negative outcomes produced as a function of AI’s journalistic ventures? These questions require attention to generate realistic expectations and policies concerning “editorial responsibility”, liability, and libel laws (see Lewis, Sanders, et al. 2019) in the era of AI.

It is also striking that the relationship of audiences with AI has not been given the attention it deserves in the current discourse. Journalists take a limited and shallow view on audiences’ capability to discern and evaluate AI-produced content as they claim that the audiences will not be able to distinguish between a human and AI written report. Explicit mention of extant (yet mixed) empirical evidence of audiences’ perceptions of automated and/or AI-produced journalistic content is still missing from the journalistic discourse on AI (see Araujo et al. 2020, Zheng, Zhong, and Yang 2018).

Study Limitations and Future Research

This study has some limitations which we hope will be addressed in future research. First, our study focuses on US and UK media and thus, our analysis and interpretation

is limited to these geographical domains and democratic cultures. Research investigating journalists' coverage of AI in other countries is needed to understand if political and socio-cultural differences affect coverage of AI as applied to journalism. Also, within US and UK media, we do not sample all the media outlets and thus, it is possible overarching themes found would differ within a larger sample size.

While the coders met regularly during the course of research to compare coding and discuss emergent themes, it should be noted that this kind of qualitative approach retains limitations with regards to author subjectivity. Future research utilizing other methods, in particular quantitative content analysis of media coverage and interviews with journalists, would be useful to triangulate the results of this study.

Finally, given the truncated time frame of this research, and how rapidly conversations around technological innovation evolve, it would be pertinent to explore how the emergent themes identified in this study change—in nature and in prevalence—over time. It is likely, given the emergence of novel AI and automated technologies and their imposition into the many different stages of newsmaking, that sentiments towards AI in the newsroom will likely change as the nature of the technology and how it is implemented evolves.

Conclusion: Normative Ideals of Journalism Revisited and Reimagined in the Age of AI

What does AI mean for the normative ideals of journalism? In our exploration of the discourse on AI in journalism, the contestations over the use, both real and actual, of AI in the newsroom appear to be less directly about the technology itself and more a trigger for journalists to contend with the normative ideals and boundaries of their profession. First, the division between optimism and skepticism appears to align with economic priorities. Those charged with the economic survival of journalism—funders, newsroom leaders and those concerned with the future of journalism as an economically productive industry—are the most techno-optimistic, willing to embrace AI and automated technologies in order to produce more content, faster and for lower overheads. Journalists working on the ground, however, address the complications this orientation presents for their institution, professional identity and the democratic and informational roles of journalism. Meta-journalistic discourse thus places AI as a boundary object within journalism, a site of contestation for an increasingly broad range of actors to grapple with the survival of journalism within the digital era and how automated technologies may alter the products of journalism and the role it plays within audiences' information diets. AI thus exists as both a practical tool and as a boundary object—a metaphorical meeting space around which actors from both within and (traditionally) outside of journalism meet to negotiate both the practical realities of newsmaking—how, when and where it should take place—its broader meanings—what constitutes “journalism” and who (or what) can rightfully produce it?

Second, crucially absent from this discourse is a foundational technical understanding of AI. Lacking within coverage of AI in journalism is a concrete knowledge of the technical potentials and realistic future of AI. Further, discussion focuses almost exclusively on the role of AI in content production—i.e., in the analysis and writing stages

of journalism—ignoring the broader implementation of AI in every stage of the journalistic value chain (Jamil 2021; Chan-Olmsted 2019). While some cursory mentions of the vast potential of AI for journalism highlight some understanding of its potential value, its narrowing within the broader discussion exists as either an intentional diminishing of its potential, evidence of a lack of knowledge around its technical capacities, or, most likely, some combination of both. This is further reflected in pervasive technological determinism amongst journalists, with journalists viewing the deployment of AI as at most an inevitability within newsrooms.

Given that this coverage informs public knowledge and opinions of AI (more broadly, and specifically in its application to journalism), this blindspot is significant. Moreover, if AI represents a challenge, or at least a significant change, to the practice, products and labor of journalism it is vital that discourse is grounded in technical reality. This lack of technical focus may be explained by a need to translate complexity to public audiences, however future research should look to examine actual use and knowledge of AI by journalists.

In sum, there exists a lack of consensus over whether AI will be a positive force within journalism. There are concrete positives to using AI and other automated technologies within the newsroom, particularly pertaining to cost-cutting, efficiency and an expansion of data-related research. However, the implementation of these technologies is far from benign, bringing to the fore concerns over how technology reshapes journalism as an industry and a community of practice, how it might threaten or undermine journalistic labor and how it may test already shaky relationships between outlets and audiences. These concerns are not only practical but speak to broader existential questions over whether journalism is fundamentally a human act. Can a newsroom full of robots really produce what we have traditionally defined as journalism?

Notes

1. See <https://openai.com/blog/openai-api/> where the program's API can be requested from the developers.
2. Of the twenty outlets included in the sample only one outlet— *The Wall Street Journal*—did not produce any coverage that met our inclusion criteria.

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Appendix

Table 1. List of publications and the number of articles analyzed in the study.

Source	Partisan leaning	Type	# of articles
Business Insider	Non-Partisan	Digital Native	1
The Economist	Non-Partisan	Traditional	1
Forbes	Center-Right	Digital First	6
The Guardian	Center-Left	Digital Native	14
The Intercept	Left-leaning	Digital Native	1
Medium	Non-Partisan	Digital Native	3
Newsweek	Left-leaning	Traditional	4
TechCrunch	Non-Partisan	Digital Native	12
The New York Times	Center-Left	Traditional	13
BBC	Non-Partisan	Traditional	3
USA Today	Non-Partisan	Traditional	9
Vox	Left	Digital Native	9
Wired	Non-Partisan	Digital First	2
The Washington Post	Center-Left	Traditional	3
The Times of London	Center-Right	Traditional	3
The Daily Mail	Right-leaning	Traditional	3
The Telegraph	Right-leaning	Traditional	4
The Independent	Non-Partisan	Traditional	3
Metro	Non-Partisan	Traditional	1