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RESEARCH ARTICLE

JASIST WILEY

Making newsworthy news: The integral role of creativity and verification in the human information behavior that drives news story creation

Marisela Gutierrez Lopez¹  | Stephann Makri²  | Andrew MacFarlane²  |
Colin Porlezza³  | Glenda Cooper²  | Sondess Missaoui⁴ 

¹University of Bristol, Bristol, UK

²City, University of London, London, UK

³Università della Svizzera italiana,
Lugano, Switzerland

⁴University of York, York, UK

Correspondence

Marisela Gutierrez Lopez, University of
Bristol, 11 Priory Rd, Bristol BS8 1TU,
UK.

Email: marisela.gutierrezlopez@bristol.
ac.uk

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Abstract

Creativity and verification are intrinsic to high-quality journalism, but their role is often poorly visible in news story creation. Journalists face relentless commercial pressures that threaten to compromise story quality, in a digital era where their ethical obligation not to mislead the public has never been more important. It is therefore crucial to investigate how journalists can be supported to produce stories that are original, impactful, and factually accurate, under tight deadlines. We present findings from 14 semistructured interviews, where we asked journalists to discuss the creation of a recent news story to understand the process and associated human information behavior (HIB). Six overarching behaviors were identified: *discovering*, *collecting*, *organizing*, *interrogating*, *contextualizing*, and *publishing*. Creativity and verification were embedded throughout news story creation and integral to journalists' HIB, highlighting their ubiquity. They often manifested at a micro level; in small-scale but vital activities that drove and facilitated story creation. Their ubiquitous role highlights the importance of creativity and verification support being woven into functionality that facilitates information acquisition and use in digital information tools for journalists.

1 | INTRODUCTION

Contemporary journalism is under constant commercial pressure, on the one hand to produce factually accurate stories and on the other to engage and capture audiences, generating revenue for media organizations. Traditional news providers compete for attention with click-bait news websites that exploit emotionally loaded headlines for financial gain (Himma-Kadakas, 2017). This makes it more difficult, but also more important, to ensure news stories

are both accurate *and* compelling. Journalists are now even more time-pressured to produce stories with fewer resources, having to operate within an information landscape where mis/disinformation are rife (Martin, 2017). This precarious situation may undermine trust in media (Newman, 2020). More positively, professional journalists now hold themselves to even higher standards when challenged by external influences (Elliott & Spence, 2018; Gutierrez Lopez et al., 2022; Newman, 2021). In particular, these pressures have enshrined *truth* as a non-

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negotiable characteristic of news (Kovach & Rosenstiel, 2001). However, presenting accurate information which cites authoritative sources is not sufficient to produce news stories that capture readers' interest.

Journalists' work is situated between two different and seemingly contradictory discourses: "one an objectivity discourse which values unbiased reporting of the facts; and a second overtly affective one," (p. 8) which is characterized as "finding the hook" (p. 8) (or story angle) to connect with readers (Olsson, 2013). As a result, journalists experience a constant tension that involves producing stories that engage audiences without bending the truth. On the one hand, journalists harness their *creativity* to produce impactful stories aimed at intriguing and capturing readers (Malmelin & Nivari-Lindström, 2017). On the other hand, they demonstrate "a methodological commitment to accuracy" (p. 669) by engaging in *verification* to produce structurally sound, authoritative stories (Shapiro et al., 2013). Our work is at the intersection of these two discourses: how journalists use creativity to produce stories that have "some kind of value, impact or recognition" (Witschge et al., 2019, p. 976) and engage in verification to ensure accuracy. Creativity and verification are widely recognized as intrinsic and integral aspects of newswork (Deuze, 2019; Shapiro et al., 2016). However, their role in the information acquisition and use that facilitates newswork has not yet been examined. This research investigates journalists' human information behavior (HIB) during story creation and highlights the integral, embedded, and ubiquitous role of creativity and verification across that behavior.

From an informational standpoint, verification is often associated with *accuracy* (Fallis, 2004), *credibility* (Danielson & Rieh, 2007; Rieh & Hilligoss, 2008), and *authority* (Finn, 2016). In a news context, verification allows journalists to "objectively parse reality" (Hermida, 2015, p. 60). Previous research has found verification practices are embedded throughout the news cycle (Shapiro et al., 2013; Tolmie et al., 2017). Creativity is also integral to news creation, "starting with story ideation and inspiration; creative approaches to researching, gathering, selecting, and verifying information; the production process, promoting, publishing, and distributing the news, up to and including creative ways to engage the audience" (Deuze, 2019, p. 130). Information acquisition and use provides "a foundation for creative work" (Medaille, 2010, p. 344) as information is transformed into new products. In this way, while the context of news organizations might constrain journalistic autonomy (e.g., stories are likely to be assigned by editors rather than encountered by journalists), creativity is considered a key element in story idea generation (Bird-Meyer & Erdelez, 2021).

In sum, creativity and verification are intrinsic in journalistic work, but tend to be *poorly visible* since they are difficult to pinpoint in practice. In information science, creativity has mostly been examined by studying the early stages of artistic or design processes (e.g., Laing & Masoodian, 2015; Makri et al., 2019) and verification has mostly been discussed as a discrete information activity (Ellis et al., 1993), despite it being acknowledged as often being facilitated through information-seeking (Costello & Veinot, 2019). However, the role of creativity and verification in information acquisition and use associated with news story creation—the entire process from story ideation to publishing—has not previously been examined. Our research is guided by three research questions:

- RQ1: What role do creativity and verification play in the breadth of information acquisition and use activities that drive news story creation?
- RQ2: When, how and why do journalists undertake creativity and verification as part of the information acquisition and use activities that drive news story creation?
- RQ3: What are implications for the design of digital information tools for journalists? How can we better support creativity and verification during the information acquisition and use activities that drive news story creation?

Understanding the role of creativity and verification in the information acquisition and use activities that drive news story creation is crucial in the digital era, as journalists must produce stories that are on the one hand original and appealing and, on the other, factually accurate and non-misleading (Newman, 2022). This research re-frames the roles of creativity and verification in journalism by making them more visible in the HIB journalists undertake to create news stories. This provides a new perspective on how to better support creativity and verification in digital information tools for journalists.

We interviewed 14 journalists using a story-based interview approach inspired by the critical incident technique (CIT) (Flanagan, 1984) that involved using recent news stories the journalists had researched and written as research probes to articulate the human information behavior (HIB) they undertook during story creation. We found six overarching information behaviors: *discovering*, *collecting*, *organizing*, *interrogating*, *contextualizing*, and *publishing*. Creativity and verification activities were embedded throughout these behaviors, highlighting their ubiquity. They often manifested at a micro level; in small-scale but vital activities that facilitated story creation. Their ubiquitous role highlights the importance of

creativity and verification support being woven into functionality that facilitates information acquisition and use in digital information environments for journalists.

In the rest of this article, we first discuss related work on information-seeking in journalism, and on creativity and verification in both journalism and information science. We then explain and justify our interview and data analysis approaches. Next, we present our findings; how creativity and verification manifest in the HIB that spans the news story creation process, and discuss how they help frame creativity and verification as integral to and embedded within the information behavior that facilitates story creation, and related implications for designing digital information environments for journalists.

2 | RELATED WORK

2.1 | Information seeking in journalism

Information plays a central role in journalism. “The sheer size of journalists’ appetites, their requirement for authoritative and current information, and the speed with which they need the information” has been widely recognized (Nicholas et al., 2000, p. 51). Journalists have a unique information-seeking approach, which strongly emphasizes identifying “newsworthy” information with potential to create impact (Campbell, 1997) and ensuring stories created are original and based on credible information (Attfield & Dowell, 2003). Journalism’s core activities and values have remained the same in the digital era: “to gather evidence from authoritative sources, create news stories and convey them” (Martin, 2017, p. 49).

To convey stories in original and impactful ways, finding a “story angle” is essential (Attfield et al., 2003). This is a proposition or central factual claim that drives a perspective that dominates the story (Campbell, 1997). Three key journalistic values shape how journalists find, evaluate, and manage information and how story angles are determined: *originality*, *newsworthiness*, and *truth* (Attfield et al., 2003). Originality provides a new perspective to other published stories. Newsworthiness captures readers with engaging stories. Truth involves representing situations or events in an accurate, factual way. These values link strongly to creativity and verification; originality and newsworthiness can be achieved through creativity and ascertaining truth through verification. Our research highlights the key role of creativity and verification in the information acquisition and use behavior journalists engage in to facilitate story creation.

2.2 | Creativity in journalism

Several studies have explored the intersection of information acquisition and creativity in the work of, for example, designers (Damen & Toh, 2019; Makri et al., 2019; Mougenot et al., 2007), scientists (Bawden, 1986), theater artists (Medaille, 2010), and music composers (Eaglestone et al., 2007). In a journalism context, Bird-Meyer and Erdelez (2021) highlighted the role of creativity in journalists’ serendipitous encounters with information, as “the concept of creativity is critical in the exploration of journalistic story ideation in how environment and structure help inspire serendipity” (p. 439). Creativity can be considered both a driver and outcome of information acquisition, reflected in both process and product—i.e., what is created with the information found (Makri & Warwick, 2010). As this differs across professions, creativity should be investigated in the context of particular activities (Zhang et al., 2020), in our case news story creation.

Creativity involves “novel work that is accepted as tenable or useful or satisfying by a group at some point in time” (Stein, 1967, p. 109). Creativity is inherent to journalism, and manifests throughout its practices, ethos, and across different genres and outlets (Coffee, 2010). It is heralded as a special ability that brings something “extra” to news stories (Deuze, 2019). Creativity in journalism can be self-referential and found throughout journalists’ work practices (Coffee, 2010). The role of creativity in journalism is often stigmatized in favor of normative perspectives, and thus remains understudied (Witschge et al., 2019). We elaborate two concepts in creativity that are relevant to journalism and can potentially be facilitated (in part) by information acquisition and use: *inspiring and generating new ideas* and *finding novel approaches to develop ideas*.

2.2.1 | Inspiring and generating new ideas

Information seeking can inspire idea generation through exploratory information seeking, in so-called “inspiration searches” (Makri et al., 2019, p. 776). Inspiration can come from different origins and has an ongoing character, as it can happen any time during information seeking and use. (Attfield et al. 2003) followed a music journalist while completing a news assignment and found the journalist’s information gathering activities directly supported idea generation. Similarly, in interviews with print media journalists, (Bird-Meyer et al., 2019) found story creation often involved idea generation, especially when the brief afforded the journalist some creative freedom (rather than necessitating routine reporting). Much of this idea generation was spurred by serendipitous information

encounters that arose from being “at the right place and time” and being prepared with domain knowledge to identify original story ideas (ibid). Domain knowledge plays a key role in sparking sudden discoveries or “eureka” moments (Anderson, 2011). Likewise, a “prepared mind” is essential for identifying creative story angles (Attfield et al., 2003).

2.2.2 | Finding novel approaches to develop ideas

Idea development involves “working up” newly generated ideas and often involves information acquisition and use to support this (Makri et al., 2019; Zhang et al., 2020). For example, designers use information to learn new tools, techniques or skills to put their ideas into practice (Mougenot et al., 2007). For journalists, this involves working ideas into a new story angle or unconventional approach to covering a story (Deuze, 2019). Usually, journalists develop and repurpose existing story ideas with new angles, rather than find unique ones, as this is often impossible due to time and resource constraints (Malmelin & Nivari-Lindström, 2017). Finding a new spin on an existing story angle is what provides novelty and originality to news stories (Attfield & Dowell, 2003; Malmelin & Nivari-Lindström, 2017). Our findings highlight how these aspects of creativity (inspiring, generating and developing ideas) are integral to journalists’ information acquisition and use during news story creation.

2.3 | Verification in journalism

Verification involves “the activities associated with checking the accuracy of information” (Ellis et al., 1993, p. 359). Verifying news story accuracy is a nonstandardized process, as different types of information must be verified in more or less rigorous ways (Hermida, 2015). As verification can take many shapes and forms, it is difficult to narrow it down to systematic practices and methods, or to precisely describe how it looks in action (Shapiro et al., 2013). As this process is circular and embedded in news cycles (Tolmie et al., 2017), verification in journalism cannot be regarded as a discrete behavior (Martin, 2014, 2015). This echoes the nature of verification in general, which has been described as a “a continuous and iterative process” (Rieh & Hilligoss, 2008, p. 60) to establish credibility.

The need to verify information often emerges from identifying signs of potential inaccuracy, which spurs a desire to assess its accuracy, credibility or authority

and/or to seek additional information to support or undermine its accuracy. For example, chemists often verified information after spotting typographical or more complex mistakes (Ellis et al., 1993), while college students were more likely to verify information after finding inconsistencies among multiple sources (Rieh & Hilligoss, 2008). In journalism, finding and corroborating information is an important means of verification across the activities of identifying, selecting, and writing a story (Tolmie et al., 2017).

Ironically, despite the high value of establishing the accuracy, credibility and authority of information during story creations, journalists only invest a limited amount of time in verification (Fallis, 2004). This is because there is an inconsistency between what people consider important to verify and what they verify in practice (Danielson & Rieh, 2007). Due to time pressure, journalists are selective about what information they verify, making verification decisions based on their verification capabilities and the circumstances in which the information will be used (Shapiro et al., 2016). Journalists often make “pragmatic compromises” (p. 658) when deciding what information to verify (Shapiro et al., 2013). For instance, they might thoroughly verify key facts such as names of people or places, but rely on their professional “gut feeling” to establish the accuracy of more complex facts (Diekerhof & Bakker, 2012). We elaborate three concepts that connect the journalistic and informational perspectives of verification and are a starting point for understanding journalists’ information acquisition and use during news story creation: *corroborating information*, *selecting authoritative sources*, and *presenting verified information*.

Corroborating information involves finding the same facts in alternative, independent, sources (Fallis, 2004; Torres et al., 2018) and considering the veracity of the information after considering different perspectives over time (Rieh & Hilligoss, 2008). Journalists often check information with multiple sources (often domain experts) (Nicholas et al., 2000). Source triangulation of this sort is used to prove or disprove hypotheses or story angles, thus serving to progress stories.

Journalists often use their perceptions of **authority of a particular source** to make a judgment on the accuracy of information within it (Fallis, 2004). Journalists tend to consider some types of information sources, such as official document of a legal, governmental or scientific nature as particularly authoritative (Shapiro et al., 2013). The same applies to domain experts (Olsson, 2013) and although journalists do use social media to gather information (Tolmie et al., 2017), they mostly rely on official sources, including personal connections (Martin, 2015).

When reporting news, journalists aim to provide an appropriate interpretation of information and present it in a fair and balanced way (Nicholas & Martin, 1997). To facilitate this, they may conduct **verification** checks on their own work, for example to ensure it reflects “indicators of accuracy” (Fallis, 2004), such as linking to reliable sources. They may also subedit the content: to avoid typographical errors (which can raise concerns about information credibility; Fallis, 2004) and to ensure they provide a balanced view, where balance is sought.

Our findings demonstrate these aspects of verification (corroborating and selecting authoritative sources and presenting information in ways that lend to perceptions of credibility) are not only integral to news story creation (as found by Tolmie et al., 2017), but also to the information and use behavior that facilitates it.

3 | METHODS

3.1 | Sampling approach

To understand the HIB that facilitates news story creation, we interviewed 14 journalists (9 identified as male, 5 female), across 6 large newsrooms in London. Interviewing across multiple private and public organizations ensured a diversity of stories and associated HIB and thus supports generalizability across newsrooms. We used a variety of recruitment mechanisms including networking events, professional contacts, and snowballing. All but one participant worked full-time in established newsrooms. The other was a freelancer who wrote for national news organizations and specialized news outlets. They reflected a variety of roles, levels, experience and specialisms and all published stories on a near-daily basis. Roles included “Journalist,” “Data Journalist,” “Editor,” and “Freelancer” (we refer to these collectively as “journalists”) with specialisms spanning health, politics, business, data journalism, breaking news, and long-form stories.

Journalists discussed 27 stories in total, each at a different level of detail depending on their recollection. Broad story subjects included armed conflict, crime, domestic politics, election costs and results, racial discrimination, global disease outbreaks, water crisis, company collapse, medical record mismanagement, consumer fraud and investigations into the conduct of a religious leader and animal welfare organization. To preserve journalists’ anonymity, we do not discuss specific details of their stories.

We used the concept of information power (Malterud et al., 2016) to guide our sample size, stopping at the point new stories did not enhance our understanding of news story creation, associated HIB, or the role of

creativity and verification (i.e., based on the *amount of relevant information* pertinent to our research questions).

3.2 | Interview approach

Our interview approach was inspired by the critical incident technique (Flanagan, 1954), which has been successfully used to elicit detailed recent memorable examples of information interactions in Makri et al. (2019), including in a journalism context (Bird-Meyer et al., 2019; Finn, 2016). It was also inspired by previous journalism research where journalists discussed news stories they created (Shapiro et al., 2013, 2016). We used stories as research probes to articulate the human information behavior (HIB) they undertook during story creation. These stories served as “critical incidents.” Thus, we asked journalists to select and come prepared to discuss one or more stories they had recently published where finding and using information played an important role. We did not stipulate creativity or verification must have played an important role, as journalists do not always consider news story creation as “creative” and consider verification essential to ensure factualness (Shapiro et al., 2013). Furthermore, in light of the potential editorial constraints in story selection, we did not stipulate that participants must have generated the story idea themselves; it could have been assigned by an editor. However, we focused on how journalists went about developing the story idea and producing the story.

Interviews took place in a meeting room or cafeteria within the newsroom or university and lasted 20–45 min (average 35 min), depending on level of detail and journalists’ time constraints. Written consent from participants and ethical approval from our departmental Research Ethics Committee was obtained. Interviews were audio recorded and transcribed.

We began by explaining the purpose of the study and reassuring journalists our goal was to learn about their work and the role information plays in it rather than to evaluate their stories, processes, or performance. We then asked participants to talk through the entire story creation process for their selected story/stories—from generating the initial idea to producing a finished story. During the discussion, we asked specific creativity and verification-focused questions, such as “*what inspired the story?*”; “*what made it original/impactful?*”; “*how did you make a connection between these information sources?*” and “*(how) did you verify that piece of contentious information?*” These questions did not presume the importance of creativity or verification, nor make assumptions about their role. Despite this focus, we took care not to neglect the other HIB they undertook. We discouraged

journalists from discussing precise details about their story (that might make it easy to find), instead guiding them to discuss their story creation activities and associated HIB. We also asked them to avoid sharing confidential or business sensitive information.

Our data collection approach involved collecting self-reported rather than observed HIB. This relies on participants' memory, which can degrade over time. While it would have been useful to complement our interviews with observation or ethnography, the journalists were not able to commit to more than a one-off hour and all the news organizations we approached were willing for us to interview journalists, but not observe within newsrooms. Nonetheless, eliciting memorable examples has been established as a reliable approach to obtaining concrete data on peoples' HIB (Urquhart et al., 2003) and our story-based interview approach helped concretize the discussion. This supported journalists in remembering and articulating details around their news creation process and associated HIB.

3.3 | Data analysis approach

Data analysis focused on understanding the role creativity and verification played in the HIB journalists undertook during news story creation. A primarily inductive thematic analysis (Braun & Clarke, 2013) was conducted, supported by qualitative data analysis tool NVivo. We identified 59 codes related to story creation across the dataset. These codes were collated and grouped according to the information behaviors identified. In total, we created six themes related to specific information behaviors, such as *discovering* ideas for new stories and *organizing* information. The analysis was primarily inductive as we mostly identified themes by "listening" to the data in a bottom-up fashion. However, we also used several sensitizing concepts (Bowen, 2006) related to creativity and verification that cut across Information Science and Journalism Studies as a framework for understanding the data. These concepts are described in section 2.2 for creativity (e.g., inspiration, novel approaches) and section 2.3 for verification (e.g., authoritative sources, corroboration).

As we noticed early on that creativity and verification activities were difficult to tease out from other HIB, we did not attempt this. Instead, we took a holistic approach of first examining the news story creation process and associated HIB, then the role of creativity and verification within that process (and across that HIB). This allowed us to remain sensitive to the integral nature of creativity and verification rather than treating them as discrete and standalone, without presupposing this nature.

4 | FINDINGS

4.1 | Framing the findings: The "information journey"

Creativity and verification were integral to the HIB journalists undertook during news story creation. In other words, they were important throughout the information acquisition and use activities that drove and facilitated story creation. Given their ubiquity, we decided to use an existing model of HIB to help frame these findings; the "information journey" (Blandford & Attfield, 2010). We chose this model as the information journey is presented at a high enough level of abstraction to encompass a broad range of information acquisition and use activities (namely "recognizing an information need," "finding information," "validating and interpreting information," and "using the interpretation"). It has also been used previously to frame and contextualize the HIB of healthcare patients and, most relevant to our research, journalists writing news articles (Blandford & Attfield, 2010).

We found six overarching information behaviors, each involving aspects of creativity, verification and often both: *discovering*, *collecting*, *organizing*, *interrogating*, *contextualizing*, and *publishing*. We discuss these behaviors under the information journey stages they relate to (e.g., *interrogating* under "validating and interpreting information"). We now illustrate the information journey followed by P8 while researching and writing a health story for a national newspaper (see Figure 1). This elucidates P8's approach to news story creation, highlighting the stages of the information journey and associated HIB involved. We then focus specifically on how creativity and verification manifested across the information journey.

P8 was reporting a World Economic Forum conference and remotely attended a session on mental health and women. She **discovered** an idea for a story on women's medical issues with dementia, inspired by a question from an attendee from a UK scientific organization [*Recognize need*]. She read research published on the organization's website and considered it newsworthy, so pitched the story to an editor at a large news organization, who commissioned the story and sent P8 to expand her research. As a starting point, P8 engaged in "*treasure hunts*" (i.e., exploratory web searches) to **collect** recent information on Alzheimer's [*Find information*]. She "*sketched out*" an initial story structure, where she **organized** the information found; noting potential sources and ideas to explore further [*Validate and interpret*]. Collecting information helped P8 craft a potential story angle: the unique experiences of women living with

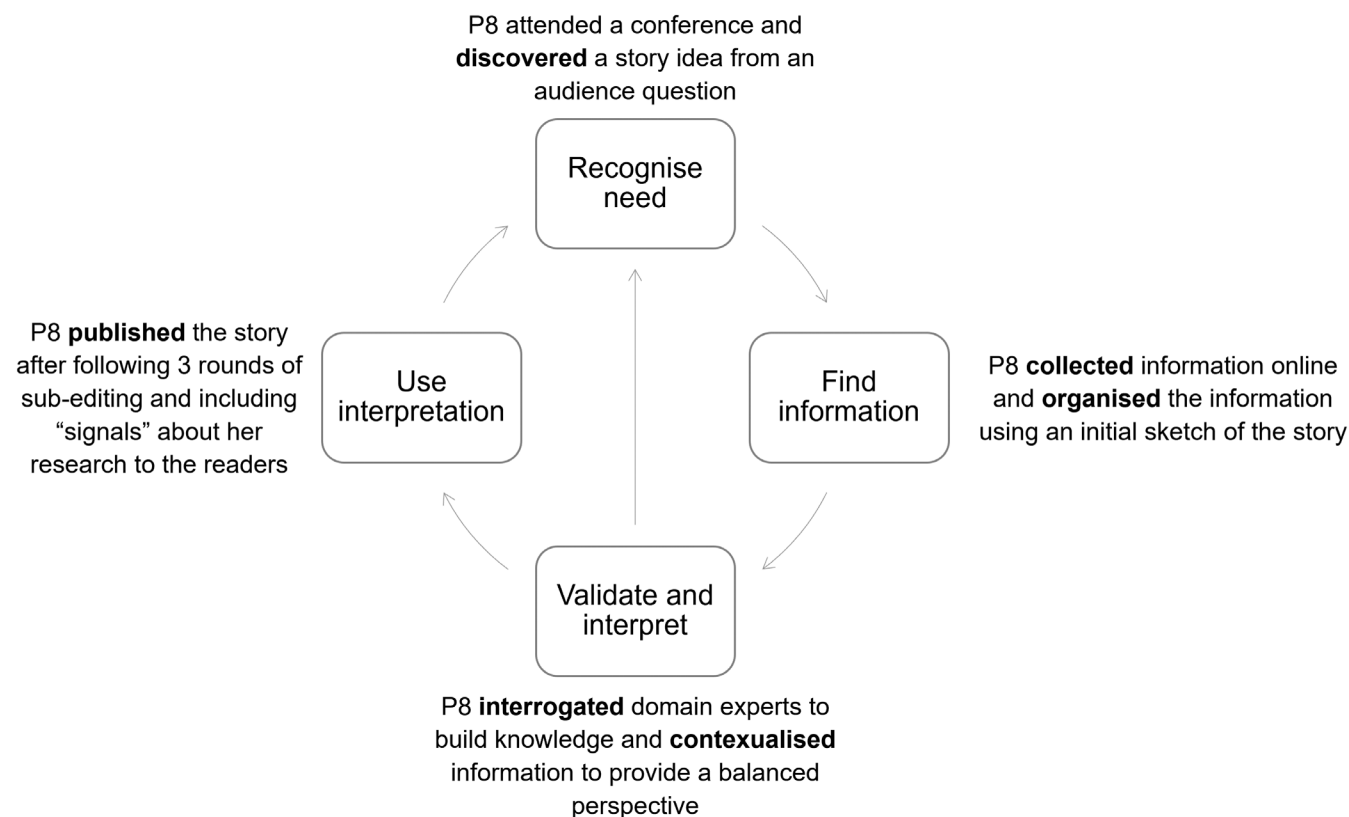


FIGURE 1 Information journey followed by P8 to create a health story for a national newspaper

dementia. P8 **interrogated** the story angle by interviewing scientists and dementia patients who helped resolve highly specialized questions. She went “*back and forth*” collecting information on the scientific advances in dementia and the lived experiences of women with it. For her, it was important to avoid presenting information in ways that might “*misrepresent a finding*” or provide “*false hope*.” Thus, she **contextualized** the information collected to different personal perspectives. **[Use interpretation].**

While P8’s information journey was typical in many ways, it represents only one possibility. Each journalist’s journey had unique characteristics (e.g., based on story type and the journalist’s specialty). However, we found consistent patterns in how stories progressed, and these form the overarching information behaviors the rest of the findings section focuses on. When mapped into the information journey model (as illustrated in P8’s example), these behaviors help us understand the integral and embedded nature of creativity and verification in news production. The behaviors we discuss are not discrete; many were interlinked or overlapping. We also identified other HIB, such as producing graphics or editing content layout, which we do not discuss here as they are not relevant to our creativity and verification focus.

Creativity and verification were interwoven throughout the information journey, manifesting in the HIB journalists undertook when researching and writing news stories. However, each story had its own “blend” of creativity and verification. For instance, data stories often used trusted sources that required less verification but more creativity to contextualize information, while stories using less trusted sources required more stringent verification. While creativity and verification were integral to news story creation in general, each story was different and involved a different blend of creativity and verification. In the next section, we reflect on the role of creativity and verification throughout the information journey described above.

4.2 | Recognizing an information need

Journalists’ information needs were initiated by a desire to find out what was going on in the world, frequently associated with a task assigned by an editor or inspired by personal interest. Often journalists became aware of a need for information at the point of **discovering ideas for new stories**. This ideation was fundamentally creative in nature and was often sparked by serendipitous information encounters.

4.2.1 | Discovering ideas for new stories (creativity)

Journalists stayed “*tuned in*” to world events to discover ideas and trigger questions that might evolve into stories, as illustrated by P12: “*sometimes you read something and it sparks an idea and you think, well, that’s interesting, I wonder if that’s the same in a different industry or area of government.*” Participants discovered potential story ideas for stories by maintaining both a passive and active awareness of relevant information landscapes. Journalists passively discovered ideas from a variety of unexpected sources and situations, including reporting events, receiving reader tip-offs, or discussions with colleagues. Journalists also discovered ideas by actively monitoring specific subjects, sources, and events according to their specialisms and interests. The most mentioned way of keeping updated was to regularly browse articles in reputable news outlets, such as the BBC and The Economist. However, as highlighted by Bird-Meyer et al. (2019), it was necessary to have “prepared mind” for identifying story ideas. P9 referred to this as “*gut feeling*” and “*instinct*,” grounded in personal interests, experience, and domain knowledge. P11 stated domain knowledge was important to identifying an original story angle: “*as time goes on you know more about [a topic] and you have more of an innate sense of what’s new, what’s interesting, what’s colourful.*”

4.3 | Finding information

In this stage of the information journey, journalists iteratively found and assessed information using a variety of digital and social sources, such as specialized databases, eyewitnesses of events, news aggregators, and search engines. Creativity and verification were highly important to finding information and we now discuss their role in **acquiring** and **organizing information**.

4.3.1 | Acquiring information

After discovering story ideas, journalists acquired information to elaborate them. They described many sources and strategies for collecting high volumes of relevant information, often tailored to their specialism and skills (e.g., data journalists often looked for large datasets, investigative journalists for interviewees). The desire to build an objective and balanced view drove their information acquisition. Journalists conducted exploratory searches to drive **development of story ideas** they generated, while verification was central to **determining authoritative**

sources to include. Creativity can be considered a key aspect of journalists’ exploratory searches because these searches facilitated creative outcomes (original stories).

Acquiring information to develop story ideas (creativity)

After discovering story ideas, the journalists conducted a background search to gain an overview of what is known (and unknown) about the subject and situate their ideas in a wider context. As they aimed to be both thorough and diverse in these exploratory searches, they often used trusted information sources they considered reputable to make this initial search time efficient. They valued diversity, as seemingly irrelevant information could become relevant later or lead them down an unexpected but fruitful path by linking or connecting them to other sources.

The outcomes of this background search helped journalists assess the newsworthiness of ideas and determine if they should be developed or discarded. Ideas they considered potentially newsworthy were “pitched” or “sold” to an editor for commissioning, as described by P1: “*you’ve got to sell it [to editors] so they feel it’s worthy enough to warrant a space in the paper.*” Thus, a challenge was to collect enough information to evaluate ideas, often in a short timespan. Participants described two approaches for acquiring information to develop story ideas: *conducting exploratory searches* and *using news articles and newsroom resources*.

Conducting exploratory searches. By “*casting a wide net*” (P3) journalists expected to find relevant information for their story, but without knowing in advance what it ought to be. Participants looked for diverse information that allowed them to explore different points of view and gradually narrowed down their searches by following story threads that demonstrated promise (of originality and newsworthiness). All frequently used Google and Google News for acquiring “*different interpretations and ideas*” (P2), as they were particularly effective for gaining a broad overview on a subject promptly. Only P4, who specialized in verifying user generated content, used social media. Most journalists avoided social media for developing story ideas as information on social platforms required extensive verification but mentioned Twitter and Facebook as useful for finding information about people, companies, and events.

Using news articles and newsroom resources. Published news stories were considered a robust starting point for both generating and developing story ideas, as story novelty was evaluated based on what was already published. Journalists used existing published stories to find creative ways to (usually incrementally) build on specific subjects with original story angles. Looking for published stories helped journalists form retrospective views about a

subject and make informed decisions on what could be a suitable angle.

Besides published stories, social information sources within newsrooms (i.e., editors, reporters) were often consulted to help uncover unexpected leads and to verify information quickly. Domain experts thereby augmented journalists' creativity and verification efforts, while supporting them in rapidly getting “*a sense of where the story fits into the bigger picture*” (P9), which was difficult by conducting online research alone.

Determining authoritative sources for collecting information (verification)

All journalists relied on “*uncontroversial*” (P1, P7) information sources, such as governmental databases, press releases and court documents. These were considered as cognitive authorities, reducing or eliminating the need for exhaustive verification. Thus, more than the information itself, journalists verified the authority of the information source. This occurred during information acquisition, rather than as a separate “verification” step. Another advantage of citing authoritative sources was ease of access, providing a shortcut to fleshing out story ideas (e.g., for P1, parliamentary data on Hansard or statistics from the Office of National Statistics [ONS] was the “*first port of call*,” as this often formed the backbone of a story).

4.3.2 | Organizing information

Journalists organized the information they found to facilitate story development, helping them decide “*where to go next*” (P11) with the story, such as human sources to contact or leads to investigate. Thus, organizing information often helped identify knowledge gaps to fill through follow-on information-seeking. Organizing incorporated aspects of creativity by supporting **idea convergence** and verification by ensuring knowledge gaps were filled by **credible information**.

Organizing information to converge a diversity of ideas (creativity)

Journalists demonstrated creativity by organizing information to *create an initial story structure* and, in the case of data-led stories, to *create ad hoc databases*. These served to converge information from different sources, driving the development of existing story ideas and sparking ideas for new stories.

Creating an initial story structure. While information acquisition was often exploratory, journalists “*need to be clear from the outset what the end destination might look like even if it changes during the work*” (P11). Thus, participants created an initial story structure to guide their

information-seeking. This helped them focus and evolve stories, with the structure reflecting their chosen original story angle. This structure supported journalists in selecting relevant information, reducing the complexity of the story and, most relevant to creativity, evolving the ideas in the story by being “*prepared for surprises*” (P8).

Creating ad hoc databases. Data journalists used a variety of datasets for creating original insights for data-led stories. For instance, P2, P3, and P7 used public data to produce forecasts and budgets around Brexit, while P5 and P12 used data to evaluate public service delivery and hold authorities accountable. While each data-led story involved a unique strategy for organizing data, all journalists created ad-hoc databases to integrate raw data extracted from different sources. These were created iteratively as journalists identified and filled new knowledge gaps, supporting development of story ideas in the process.

Organizing information to anchor stories with credible facts (verification)

Organizing information through creating an initial story structure or ad-hoc database also served a verification purpose; it helped anchor stories with credible facts. P2 fleshed out an initial story structure on the economy of a developing country with facts from official records. She noted down “*raw data or key points, such as GDP in 1994, increased 135%*.” These key points were slotted into the different sections of the story outline and helped identify what additional information she needed to find. The initial story structure facilitated verification as it ensured the facts relied on were consistent and coherent.

4.4 | Validating and interpreting information

The dynamic and evolving nature of the journalists' research (and story creation) necessitated tight-knit information interpretation. This was supported through information **contextualization**, which involved a degree of creativity. To support validation of the information acquired, the journalists **interrogated** its nature: a form of verification. While verification occurred throughout the information journey, it was most prominent at this stage (which involved dedicated validation activities).

4.4.1 | Contextualizing information to create new insights (creativity)

Contextualizing information involved placing acquired information in the context of existing knowledge around the story subject area and assessing what information is

most relevant for a particular story. This had a strong creativity focus, as determining the most relevant contextual information to include in a story involved selecting information “*worth telling people*” (P2). Creativity was integral to this as information contextualization created new, original insights to “*move the topic forward*” (P11).

Participants selected information for stories not only based on its accuracy, but how it fitted the larger story context; it was not information itself, but how it was *contextualized* that make an impactful story. Examining information in “*isolation*” could lead to “*quite narrow stories*” that are “*unappealing to broader readers*,” or worse, might lead to “*misunderstandings*” of the situation (P11). Thus, it was “*important to understand how things fit into the bigger picture*” to “*decide how big the story is or which angle to go down next*” (P11). Having a broad understanding of a subject was highly valued but required time and effort. This knowledge contextualized and simultaneously inspired stories, helping journalists identify new approaches, combine ideas in new ways, and find surprising angles. Contextualizing information also involved “*stitching*” (P4) or “*cobbling*” (P7) information together from different sources to generate new ideas, identify patterns, and highlight knowledge gaps and inconsistencies. While trying to “*piece together everything and sort of make it into a story*” (P11), it was important to talk to domain experts to avoid misinterpreting information that would later be relied on to support the story.”

4.4.2 | Interrogating information to establish credibility (verification)

A particularly prominent verification behavior at this stage of the information journey was information interrogation. Journalists interrogated information by evaluating its accuracy, credibility, and authority in several ways: *cross-referencing multiple information sources*, *consulting domain experts to corroborate information*; *determining the origin of information*; and *questioning seemingly uncontroversial information sources*. They did this to build evidence for their stories and to pose and answer questions based on their professional hunches.

Cross-referencing multiple information sources. Journalists considered single sources not to be enough evidence, so sought at least another independent source of information that contained the same content. This was referred to by various names, such as “*double-check*” (P2, P6, P13), “*overlap*” (P10), “*cross-reference*” (P5, P7), “*cross-check*” (P6), or “*stand-up*” (P4, P8). They cross-referenced information across multiple sources to ensure its credibility and thus build robust evidence for their stories. For example, P1 said if he needed information on UK prison

services, he would first look at the ONS website, then a specialist organization to see if the ONS information “*stacked up*.” Getting the same information from multiple sources strengthened the evidence for stories; P13 explained that while he would be “*quite skeptical*” reporting on the claims of one witness, he could not ignore “*ten people claiming the same thing independently*,” while further “*physical evidence*” such as legal documents enhanced the story’s credibility. Trusted sources helped cross-reference information from less trusted ones.

Consulting domain experts to corroborate information. Contacting domain experts, such as academics, specialized editors or civil servants was, for many journalists “*the best way to get some answers on what is happening*” (P4). Participants trusted experts with an established reputation to verify the accuracy and completeness of information. For example, P5 consulted with members of parliament to ensure the “*data was treated in a fair way*” in her parliamentary participation story. While contacting domain experts was considered valuable, it was also time consuming; “*there is a chance that you are wasting too much time finding the right expert*” (P9). As a corroboration shortcut, journalists often relied on the expertise of other journalists and editors in their newsroom. P1 considered experts in his newsroom invaluable for interrogating information, providing “*a good indication the information is correct*,” as they would either have sufficient domain knowledge to assess accuracy, or external sources they could “*just call up straightaway*.”

Determining the origin of information. For information such as datasets, documents, audio-visual materials and social media posts, journalists sought the original source to validate its accuracy and establish the credibility of its originator. P6 often wrote stories based on press releases, but accessed original sources (e.g., reports) cited in the releases to obtain “*the most detailed information*.” This was crucial for less reliable sources, like non-official websites or user-generated content. For example, P2 avoided use of information from data portal Statista without first establishing its provenance: “*I wouldn’t really base a story on [Statista’s] data, because it can be quite hard to find where they’ve got it from*.” In contrast, P2 highlighted official sources such as WHO and UNICEF “*very clearly state how they got their data in their releases*.”

Questioning seemingly uncontroversial information sources. While journalists broadly trusted “*uncontroversial*” (P7) information sources such as governmental sources, they identified “*a tiny chance there is an error on an official source like Companies House*” (P13), so cross-referenced with human sources regardless. Interrogating uncontroversial data was particularly relevant for data-led stories: to spot potential mistakes and

inconsistencies. As explained by P5, journalists often “*have to be thinking like data detectives*.” She recalled a story using an official dataset with information about a tiny village in Europe that indicated a “*ridiculous*” number of crimes. Using her knowledge of the village demography, P5 suspected a data error. She contacted the originator, who realized it was a typographical error. She mentioned journalists must be “*really vigilant*” about data, as stories are based on it. Ensuring dataset accuracy facilitated story accuracy.

4.5 | Using the interpretation

In this last stage of the information journey, journalists used the understanding they gained of the subject area to write and ultimately publish stories. We did not focus on the act of writing in and of itself, as this has been investigated in detail previously (Attfield et al., 2003). Instead, we report information behavior associated with **publishing**.

4.5.1 | Publishing

Publishing stories often iterated the cyclic information journey, *inspiring new ideas for follow-up or related stories*. Immediately prior to publication, journalists often invoked a form of *quality assurance* by following stringent legal and editorial controls.

Inspiring new ideas for follow-up or related stories (creativity)

Stories “came alive” once published, opening the landscape for follow-up or related stories. Published stories inspired ideas for new stories, such as those that *expanded the original story*, those that *refined knowledge gained from writing it* or those that *leveraged readers’ reactions* to it.

Expanding the original story. Publishing stories often led to writing additional articles on the subject (e.g., elaborating on unexplored ideas or exploring a different story angle). For example, P5 published separate articles expanding on the methodology of her data-led stories that involved “*quite complicated data processing*.” She considered these articles necessary for “*transparency*,” as they explained the complexity of the process behind the story.

Leveraging readers’ reactions to published stories. Considering audience response to a story often re-started the information journey by sparking new story ideas. Often this was data-led; P3 highlighted that heavily viewed stories, such as a story he wrote on election costs, were often re-commissioned at the request of SEO (Search

Engine Optimization) teams. It was up to P3 to find an original new story angle. Readers could also help find new leads for a story, driving it forwards. For example, after P14 published some business stories in the public interest, this led to “*people coming forward*” with their experiences, which provided the story “*momentum and direction*.”

Ensuring quality before publishing a story (verification)

Some verification activities were undertaken as a form of pre-publication quality assurance. These were *signaling to convey credibility* and *subediting to ensure accuracy*.

Signaling to convey credibility. Journalists consciously incorporated “quality signals” in their writing to “*signal that the research for the piece has been done well*” (P8). They did this by naming and/or linking to external sources where information within the story was obtained. They also signaled where data relied on were forecasts, approximations, or potentially imprecise. For example, P3 used asterisks to convey that the reported election costs were rough estimates, as the real figures were not yet known.

Subediting to ensure accuracy. Subediting is a well-documented process where stories are reviewed to ensure they conform to newsroom editorial and legal regulations. Subediting served a verification purpose by identifying errors, omissions or bias before publication and ensured story quality and harmonization with the news organization’s interests. P9 described a subediting process that involved editors and journalists with specialist subject knowledge ensuring factual accuracy and style adherence. They contacted her pre-publication with pertinent questions or comments such as “*where did you get this stat from?*” “*I’ve not found evidence for this,*” or even “*this number is wrong.*”

4.6 | Summary of findings

Creativity and verification were not only integral to news story creation, but also ubiquitous in the information work that supports story creation. Creativity was important when *discovering ideas for new stories* and *developing those ideas through information acquisition*, as well as when *organizing information to converge a diversity of ideas*. It was also essential when *creating new insights by contextualizing information* and in *inspiring new ideas for follow-up or related stories*. Verification was key when *determining authoritative sources for collecting information*, *organizing information to anchor stories with credible facts* and especially when *establishing credibility by interrogating information*. Verification was also central to *ensuring quality before publishing a story*.

5 | DISCUSSION

We examined the HIB involved in news story creation by asking 14 journalists to discuss news stories they had written. Story creation was driven by six overarching behaviors: *discovering*, *collecting*, *organizing*, *interrogating*, *contextualizing*, and *publishing*. Creativity and verification were key “ingredients” of these behaviors; embedded and ubiquitous across them and thus the story creation process supported by them. While most previous research on the role of creativity in information acquisition and use has focused on disciplines traditionally regarded as creative, such as art and design (e.g., Laing & Masoodian, 2015; Makri et al., 2019), our findings highlight its importance in a discipline where it remains largely invisible. Similarly, while verification has mostly been discussed as a discrete information behavior (Ellis et al., 1993), we found most HIBs journalists engaged in incorporated aspects of verification. In short, both creativity and verification were integral to and embedded throughout news story creation and the HIB that supported it. This highlights their importance in producing newsworthy news stories.

We now discuss how these findings can help re-frame the roles of creativity and verification in journalism and inform the design of novel digital information tools for journalists, by weaving support for creativity and verification into functionality that facilitates information acquisition and use.

5.1 | Re-framing creativity and verification in journalism

Creativity and verification are already widely recognized as intrinsic aspects of news story creation (Deuze, 2019; Shapiro et al., 2016). Our findings demonstrate they are also ubiquitous along the *information journey* that supports story creation. This allows us to re-frame the roles of creativity and verification in journalism in three ways, which we now discuss.

5.1.1 | Small but powerful: Little-C creativity and little-V verification

Our findings demonstrate newsworthy news stories are saturated with information behaviors that manifest creativity and verification, but that is only by examining these behaviors in detail that creativity and verification become more visible. Consistent with prior research, we found journalistic creativity can mostly be considered as “little-C” creativity (Maiden et al., 2018), where small-scale yet significant

creative actions are embedded within everyday work (Kaufman & Beghetto, 2009). In contrast, “big-C” activities represent major breakthroughs, creations, and discoveries and require significant time investment and specialization (Kaufman & Beghetto, 2009). We recognize the value of “big-C” creativity in journalism for producing ground-breaking news stories that have a lasting impact (Witschge et al., 2019). However, our findings highlight the importance of embedded, *small-scale*, yet persistent manifestations of creativity, which were present in all the stories discussed. Our findings also highlight the importance of “little-V” verification; small-scale, ubiquitous verification-focused activities embedded within broader, non-verification-specific information behaviors (such as *collecting*, *organizing* and *publishing*). These verification-focused activities, embedded within their HIB, allowed journalists to weave accuracy and credibility into the stories they created. Our findings therefore re-frame creativity and verification in journalism as manifesting in small-scale but nonetheless important activities that are part of the fabric of newsworthy news stories, and the HIB that facilitates it.

5.1.2 | Neither trivial, nor routine: Skilled shortcuts and specialization

Although small-scale, activities that manifested creativity and verification were not trivial or routine. On the contrary, they reflected highly skilled practice and specialization. Like previous research, we found tight timelines often required journalists to pursue the “easiest information option” (Campbell, 1997, p. 60), and stick to the digital tools that they feel comfortable using (Gutierrez Lopez et al., 2022). However, this did not represent a way of obtaining “good enough” information by satisficing (Prabha et al., 2007), but a way of utilizing their specialist knowledge and previous research and writing experience to make information acquisition and use more efficient and effective.

In some cases, information interactions around creativity and verification acted as “skilled shortcuts” for optimizing time and resources. For instance, consulting social sources was a skilled shortcut for building background knowledge and evaluating a potential story angle. The same activity would take far more time and effort using digital sources alone. As with previous research, we found specialization and background knowledge helped journalists encounter meaningful story ideas (Bird-Meyer et al., 2019; Bird-Meyer & Erdelez, 2018). Specialization also helped journalists develop stories in new ways, thus manifesting creativity. Journalists combined their skillset with others in the newsroom to bring a creative spin to

stories and ensure robust reporting. For instance, data journalists combined technical and traditional reporting skills to identify potentially original story angles from data and establish credibility for their team. These findings re-frame creativity and verification by considering them as manifesting in highly specialized activities mastered through professional experience and specialization, rather than in trivial or routine “little-C” or “little-V” activities. At first glance these activities may *appear* trivial or routine, but this is because they have become almost second nature to journalists, who “make them look easy.” Our findings demonstrate journalists have found ways to produce original, accurate stories in tight timescales by finding optimal ways to interact with information.

5.1.3 | Complementary and co-evolving: Creativity and verification in journalists' information journeys

As with prior research, we found there was no single way journalists operationalized creativity and verification (Coffee, 2010; Shapiro et al., 2013, 2016). Each story struck its own “balance” of originality, interest and credibility depending on the story's nature and journalist's workstyle. For instance, data journalism stories relied mostly on well-recognized cognitive authorities (e.g., government datasets) as information sources. This meant these stories required less stringent verification, but more creativity to contextualize the information in new ways. This “balance” is also reflected in the dynamic interaction between HIBs that manifest creativity and verification within the broader information journey. Most of journalists' information behavior manifested both creativity and verification. For example, journalists often *organized information* both to *converge a diversity of ideas* (involving creativity) and to *anchor stories with credible facts* (involving verification). Furthermore, activities that manifested creativity and verification sometimes fed into each other. For example, creativity supported *discovering and developing story ideas* through identification of potentially useful information sources while verification *established the credibility* of those sources, to ensure usefulness. This re-frames creativity and verification as complementary and co-evolving throughout the information journey, rather than as disparate.

5.2 | Design implications

Creativity and verification were integral to news story creation and persistent across the HIB that facilitated

it. Therefore, a broad principle for informing the design of digital information tools for journalists is to *weave support for creativity and verification into functionality that facilitates information acquisition and use*. This might be achieved by considering how creativity and verification can be better supported at each stage of journalists' story creation information journey: *discovering and developing new ideas for stories, determining authoritative sources, organizing, contextualizing and interrogating information and publishing stories*.

When acquiring information, AI-driven knowledge-graph-based functionality in search engines could help journalists *discover and develop new story ideas* by surfacing related (or partly related and potentially serendipitous) stories to those a journalist is already inspired by. This could be achieved by indexing credible, authoritative sources, identifying potentially important entities within those stories, creating meaningful relationships between those entities and allowing journalists to explore those relationships to uncover “hidden connections.” This might inspire new, creative story angles and help journalists develop promising angles by bringing potentially useful information to them. It could also support them in *contextualizing information* by helping them make meaningful connections between different information sources, allowing them to piece together the “bigger picture” around a story and select particularly interesting story angles to focus on. This functionality can also support cross-referencing information across sources (i.e., *interrogating information*).

Social functionality could allow journalists to *determine authoritative sources* by rating the authority of information sources for specific story contexts, thereby providing verification support to other journalists. Creating a social network of journalistic expertise could support journalists in finding and having informal discussions with experts in particular domain areas, beyond their newsrooms, thereby helping them to *contextualize and interrogate information*.

6 | CONCLUSION AND FUTURE WORK

This study highlights the vital role creativity and verification play in the HIB journalists engage in to support news story creation. Its key contribution is to elaborate the integrated and ubiquitous nature of creativity and verification in journalists' HIB, highlighting their importance *throughout* the information journey that supports story creation. While previous HIB research tends to regard information activities and behaviors as discrete and occurring primarily at certain stages of information

acquisition or use, our work demonstrates that, in specific information contexts, key activities and behaviors can motivate and support others. In this study, creativity and verification were woven into the fabric of the HIBs that drove and facilitated news story creation. This suggests it may be possible to (re-)examine many contexts in which information interaction is important from the perspective of embedded, persistent micro-behavior which, when viewed holistically, can provide a new perspective on the nature of information work within those contexts.

Future work could use the reframed understanding of creativity and verification in journalists' HIB to validate or extend our findings in other newsroom contexts (e.g., other news-making cultures, newsrooms that have strongly adopted AI technologies, etc.). Researchers might also examine other (non-journalistic) contexts to identify embedded and ubiquitous HIBs. This could allow them to distill the essence of information work in these disciplines to highlight important but "poorly visible" information behavior. Finally, and perhaps most importantly, future work could feed principles of integrated, embedded support for key persistent behavior into the design of digital tools, both within and outside of journalism.

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ORCID


Marisela Gutierrez Lopez  <https://orcid.org/0000-0003-4115-1975>

Stephann Makri  <https://orcid.org/0000-0002-5817-4893>

Andrew MacFarlane  <https://orcid.org/0000-0002-8057-0737>

Colin Porlezza  <https://orcid.org/0000-0002-1400-5879>

Glenda Cooper  <https://orcid.org/0000-0003-2367-8626>

Sondess Missaoui  <https://orcid.org/0000-0001-6259-8261>

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