Author(s): O'Sullivan, John; Fortunati, Leopoldina; Taipale, Sakari; Barnhurst, Kevin

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Innovators and Innovated: Newspapers and the Post-Digital Future Beyond the "Death of Print"

John O'Sullivan, School of Communications, Dublin City University, Dublin, Ireland

Leopoldina Fortunati, Department of Human Studies and Cultural Heritage, University of Udine, Italy

Sakari Taipale, Department of Social Sciences and Philosophy, University of Jyvaskyla, Jyvaskyla, Finland

Kevin Barnhurst*, Department of Communication, University of Illinois, Chicago, Illinois, USA.

*Deceased (Professor Barnhurst passed away on June 2, 2016.)

RUNNING HEAD: Innovators and Innovated

Corresponding author:

Prof. Leopoldina Fortunati,

Department of Human Studies and Cultural Heritage,

University of Udine,

Vicolo Florio, 2/B

33100 Udine

Italy

Leopoldina.Fortunati@uniud.it

Abstract

Along with other cultural organizations, newspapers, through waves of digital disruption, have become subject to a dominant narrative of crisis. But newspapers have long participated in change. A constructivist approach, qualified by consideration of media materiality, draws attention to diverse but essential processes of innovation around them. We see a contraflow of migration from digital to print are opening up a shared media space; bonding strategies are bringing multimedia to ink on paper, while bridging via boundary objects such as QR (Quick Response) codes are connecting the two. Among other initiatives, development of automation of news production, and experiments with transparency, are further evidence of an active embrace of change by newspapers that calls into question the discourse on their demise. This analysis inductively develops a nuanced account of the role of the newspaper as an object and as an institution. It suggests a hybrid, multifaceted, enduring presence of print in the complex media ecology of the future.

Keywords: materiality; print; newspaper; automation; online news; QR code; robot; transparency; drone

Introduction[1]

A sharp confrontation between print and digital characterizes the discourse on the future of newspapers and journalism. *The Economist's* August 26, 2006 story "Who killed the newspaper?" exemplifies the narrative of inexorable decline of the oldest news media format and the industry built around it in an increasingly digital world. Such narratives dwell on steep declines in circulation and advertising revenues of newspapers (Shirky, 2008). In this discourse changes undertaken by newspapers often get overlooked amidst a deterministic celebration of disruption.

We seek to move beyond this dichotomy between the stagnant analogue and the vibrant digital. We argue that the materiality of the print object, and the structures and cultures built around it, work as a matrix that facilitates innovation, enabling newspapers to co-exist with digital media. This synergetic relationship makes for a media ecosystem that is ever more complex. To understand the complexities of this emerging media environment we need to get past the narrative of decline, which narrows our perspective in counterproductive ways.

The digital orthodoxy needs to be interrogated on the basis of the facts on the ground. We need to be mindful that the decline-of-newspapers narrative foregrounds Western markets, where penetration has long been high and established reading habits leave little room for growth.[2] But the developing markets show strong increases (Milosevic & Henriksson, 2014). Overall, the World Association of Newspapers and News Publishers (WAN-IFRA) reports that global print newspaper circulation is increasing slowly, up 2 percent from 2012 to 2014 with stable revenue ($163 billion) and readership (2.5 billion adults, Milosevic & Henriksson, 2014). Further, the much-celebrated digital readership still stands at one third (800 million Internet users) of print newspaper readership (2.4 billions), and 93 percent of newspapers'

revenue comes from print, which predicted to be a principal source of income for many years (Milosevic & Henriksson, 2014). In effect, while the digital has grown significantly, the print remains by far the dominant format.[3]

A reassessment of the relative strengths and weaknesses of print and online news from the standpoint of audience use is now underway (Chyi & Tenenboim, 2016). Quantitative studies in Europe and the US report similar results on the reading of news across print, online and mobile, as well on the frequency of reading. Fortunati, Deuze and de Luca (2014), drawing on a telephone survey conducted in 2009, reported that in Europe print reading continued to be more widespread (85.1%) than online (44.2%). Similarly, a study by the Pew Research Center found that about half of newspaper readers consume newspapers only in print form. Consequently, although a new typology of trans-readership is emerging, reading of print remains relevant, with loyalty to the medium maintained (Barthel, 2016).

Online news reading undeniably has grown at the expense of print in the past two decades. For example, while in 1996 in Europe three quarters of all newspaper readers were frequent readers, in 2009 this had fallen to 53.4% (Fortunati, Deuze, de Luca, 2014). In the US, the share of US adults who often get news from print newspapers fell from 27% to 20% between 2013 and 2016 (Mitchell, Gottfried, Barthel, Shearer 2016). However, the European study exposes the extent to which print reading overlaps with online: 22.4% of Europeans were frequent readers only of print newspapers, while just 4.4% were frequent readers only of online newspapers, gainsaying the often repeated claim of cannibalization or substitution of print by digital.

But beyond statistical trends, the terminal decline-of-newspapers narrative is mistaken conceptually. While media history shows some examples of communication platforms that have declined to their death (e.g. fax), generally the arrival of a new medium leads to a restructuring of the media ecology. Historian Adrian Johns (2015), discussing the history of the book, shows how actors in each era of media evolution redefined the story of print to fit their contemporary needs.

In this article, we first posit that a key to understanding the staying power of the printed newspaper is to recognize its rooted materiality. Thereafter we show how the newspaper, as both medium and institution, has been innovating far more than is generally realized. We discuss how a contraflow of migration from digital to print is opening up a shared media space; bonding strategies are bringing multimedia to ink on paper, while bridging via boundary objects such as QR (Quick Response) codes are connecting the two. We also discuss development of automation of news production and experiments with transparency. Lastly, we discuss a hybrid, multifaceted, enduring presence of printed newspaper in the complex media ecology of the future.

The materiality of the newspaper

The line between analogue and digital news have been blurring in complex ways. Digital technologies are used to produce print editions, while much digital content originates in print or newsrooms originally created for print. Since analogue and digital now form two dimensions of news production and distribution, it is necessary to capture their specific characteristics, features and affordances.

Against a backdrop of mounting interest in materiality more generally, consideration of news media objects or 'things' has gathered pace recently. Seeing ahead of his times, Paolo Carpignano (1999) observed that the 'object domain' was receiving inadequate attention. He was concerned that the shift from the printed word – books and newspapers – to electronic communications was damaging the Habermasian public sphere. While primarily focused on the degradation of public deliberation with the advent of television and an attendant shift to trivialization, Carpignano extended this analysis to the Internet. His concern was echoed by Chris Hedges (2010), former journalist of *The New York Times,* in a trenchant and prescient conceptualization – prior to the election of Donald Trump – of a mass retreat from reality in a post-literate era.[4] Waller (2012), in a more specific context, pointed to a necessity for graphic literacy on the part of both producer and consumer, and links it to functional literacy (Waller, 2012).

These contributions have been followed by substantial works on materiality – two edited collections (Gillespie, Boczkowski and Foot, 2013; Wiley and Packer, 2012; and a special issue of *Journalism* (Anderson and De Maeyer, 2015; Boczkowski, 2015) – as a primarily social constructivist domain is inflected to accommodate, cautiously and perhaps uncomfortably, an 'object-oriented' approach to journalism studies. Even so, digital objects, viewed via the lens of actor-network theory, thus far have been the primary focus of those examining the 'thinginess' of media (Schudson, 2015). Ironically, the 'thingiest' of all media – the newspaper – has been relatively neglected.

Pursuing such object-oriented understandings, Fortunati, Taipale and Farinosi (2015) show that print newspapers and online newspapers are different objects with which users have

specific experiences. Firstly, while readers perceive the print newspaper as an object that is complete in itself, they lose the sense of the totality of the object in the case of online artifacts. To access an online newspaper, one must first access a digital device and the Internet, so its physical dimensions are more evanescent and less immediate. The reader of the print newspaper can take its measure at a glance, understanding it size and roughly how many pages it has. So, reading a print newspaper is an experiential continuum, whereas the online experience is more fragmented; users see only the main page on their screen. Second, print and online newspapers present a radically different manipulability. When holding a print newspaper the reader can handle the object in its entirety, whereas online one only has access to one page at a time. While readers control the 'print newspaper' object, they cannot do the same with online newspapers. This different materiality engenders a different sense of ownership in readers. Print newspapers are bought and possessed, while online newspapers typically are not. As readers pay for a print copy, they can use it as they want (for example, by cutting out articles), and can give or lend it to others.

Printed newspapers trigger more social interactions and encounters – for example, on the way to and at a newsstand, or reading in a public place – while online newspapers tend toward more mediated participation and self-expression. The thing-power of print newspapers is higher than that of online newspapers, because they 'do more things', have more capacity to catalyze multisensoriality, and co-present social events (such as reading together and sharing). Readers of print and online newspapers have different degrees of freedom in their use, different reading styles, emotions and retention, as well as rituals, gestures and postures. Studies show how the material characteristics of reading devices shape the reader's body and entail different types of immaterial labor (Taipale, 2015). In spite of such multifarious differences, many consider these two very different objects as if they were the same.

A recent wave of studies focusing on the modalities of reading of print and online newspapers, provide insights into their varying characteristics, features and affordances (Fortunati & Vincent, 2014; Taipale, 2014, 2015; Kortelainen, 2015; Farinosi, Lim, Roll, 2016). These studies have shown that reading on paper and digitally are not the same and the readers' appreciations of their features varies with factors such as context, activity, and content type. More than a communicative act, reading is a process in which different technologies (paper or screen) enhance different phases (Sellen and Harper, 2002). Such variation continues to explain the rise of transmedia reading, as opposed to substitution of one medium by another. The conceptual point developed by this corpus of research is that print and digital, while different, are not necessarily in opposition or in competition. Digital does what print does, not better, but differently. Accordingly, it does not make sense to conclude dualistically that the world is becoming digital and that there will be no place for newspapers (or books in print). As posited by Alessandro Ludovico (2012), the emerging media ecology will not be defined by a digital and analogue binary. Rather, it will comprise various media types, in a complex distillation and hybridization of platforms, to form the post-digital.

Print News and Innovation

A review of news and tech industry trade publications, reports in popular media, research literature since 2010, and the authors' own research, suggests that five key processes – migration, bonding, bridging, automation and transparency – are underway. Each process centers on the print newspaper as a platform or as a news organization.

Migration. The process of migration marks movements across a boundary between print and digital. Primarily, such movement has been from print to digital. In 2009 two high-profile cases, the *Seattle Post-Intelligencer* and *Christian Science Monitor,* famously stopped their presses and reinvented themselves as online only (Clark, 2009). The news meme of print shutdowns, especially in the UK and USA, cast the Internet as the killer of newspapers and blamed their owners and managers for failing to engage with digitization (Brüggemann et al., 2016).

The decline of newspapers, widely depicted as an unstoppable, began showing signs of a turn with an unexpected reverse migration – from online to print. *Newsweek* was instrumental in overturning conventional wisdom. Its new media oriented owner closed down the printed version in late 2012 (Daniel & Hagey, 2012), but "that experiment was declared a failure by the end of 2013" (Milner, 2014, para. 1). In March 2014, *Newsweek* launched a weekly print edition positioning itself with a premium price and higher-quality paper than that of *Time*. It soon turned a profit (Doctor, 2014, Husni, 2015).

In November 2014 the technology website CNET printed its first magazine aimed at the mainstream technology consumer market. Other US websites to make the "reverse publishing" transition include *AllRecipes,* pop-culture outlet *Pitchfork, Politico, Tablet,* and *WebMD,* while a book imprint grew out of the YouTube channel Awesomeness TV (Blair, 2014). The appearance in print of entities from the digital world highlights a growing porousness, interweaving, and complementarity between print and newer media forms.

Instances of softening boundaries have been dubbed "new, new media." Besides online publications moving to print, in the US 204 magazines were launched in 2015, and

newspapers rediscovered high-quality print production. A successful fashion supplement led the *Wall Street Journal* to launching another magazine. This reversal has flipped the familiar language of digital evangelists. For instance, Alana Newhouse, editor-in-chief of *Tablet*, outlines a scenario in which the resistant digital "old guard" calls the innovative move to print crazy (Gourarie, 2015, last para.).

Another indicator of the continued relevance of print is the spate of recent investments by business magnates in newspapers. Warren Buffet's Berkshire Hathaway began a program of buying US regional newspapers in 2012, which by early 2014 had spent more than 400 million dollars. Some dismissed Berkshire Hathaway's investment as a "mop-up" of cheap assets for short-term turnaround, peripheral to its total interests (Benton, 2014, last para.). But reports indicate Berkshire invested further, retooling newspapers, experimenting in digital technologies, and adding titles, with annual after-tax returns of 10 percent (Das, 2014).

When Jeff Bezos of Amazon took over *The Washington Post,* he endorsed the newspaper ethos, added staff and retained local bureaus, re-conceptualized the daily "edition" as a bundle, and embarked on creation of new offerings for digital devices. In another innovative move he gave subscribers of 100 US newspapers free access to the *Post's* website and apps. While the iconoclastic Bezos may view print as one offering among others in a suite of media platforms the *Post* plans to deploy (Myers, 2014), such recent moves underscore the newspaper's enduring qualities and suggest that it will be at the core of his larger project's identity.

Outside the news industry, fashion website *Net-a-Porter* also went against the grain of the "dead trees" narrative by starting the print magazine *Porter* in February 2014. The site's

editorial director, Tess Macleod-Smith, writes in the opening issue that paper has never been so vital for fashion magazines. *Porter* has become a technical hybrid, a "shoppable" magazine with fashion items and accessories available for purchase using a mobile app (Burrell, 2014). In a similar vein, an association with quality was underscored in a survey of premium long-haul airline passengers which showed a continued preference for print newspapers and magazines over digital reading, particularly among millennials (Sehl, 2016).

The newspaper industry has also begun "rediscovering" print for local news. In the UK, Tindle, a large local-media group, ran counter to the tide of layoffs, downsizings and closures of regional newspapers. It survived the economic downturn by focusing on local news and launching new titles. Private ownership freed the group from shareholders' short-term demands for "obscene profits" (Jones & Salter, 2012). Independent, hyper-local start-ups such as the *Hackney Citizen, Bristol Bugle, HU17.net, One and Other* and *Macclesfield Today* began on paper. One of the editors commented: "the future of local news remains predominately in print" (Ponsford, 2013, para. 4; Radcliffe, 2013). In Ireland, the current affairs magazine *Village* has focused on print since 2004, and *Rabble* emerged in 2011 as an underground community magazine with a complementing blog. Its youthful tone might suggest online-only irreverence, a feature it shares with student newspapers. It has been joined in print in 2016 by the alternative local news outlet *Dublin Inquirer*, which specializes in quality reporting of urban affairs. In Germany the community outlet *MyHeimat,* a new-media exemplar of "produsage," augmented its online offerings with inserts in local print newspapers (Bruns, 2011).

Such developments indicate a continuing place for ink on paper in the evolving digital media sphere. Instances of print meshing with digital outside of large-scale newspaper

publishing point to the strengths of print when in comes to audience engagement.

Bridging. Bridging strategies converge print and digital while keeping the physical characteristics of each mostly unchanged. A boundary object connects the two, preserving the valued characteristics of print, such as emotional and multi-sensorial involvement, while adding some features of the new medium, making it more interactive, multimedia, and flexible. Several technologies show the potential, but the most-used is the machine-readable QR code (Fortunati, Taipale & Farinosi, 2015). Some newspapers have made regular use of QR codes. *La Repubblica* and the weekly magazine *Panorama* introduced them in Italy. Powa in UK allows print readers to use a mobile device to make purchases or register with a retailer (Neff, 2015). *The Wall Street Journal* places codes at the end of selected articles to give readers access to a video or point to WSJ.com. The codes offer multimedia content to readers, bridging the static print medium and dynamic platforms such as apps or website. Readers may further interact by sharing content on social media, but QR codes visually change the print edition in only in a minor way.

QR codes thus far have added online videos, images and other news content, following the more-is-better principle of developers, to newspapers and magazines (Harper, 2010). Growing awareness of QR codes together with assessments of their usefulness suggest that bridging strategies will likely grow. A majority of young adults studied in the UK and Italy know of and have positive attitudes toward QR codes (Ramsden, 2010; Olivotto, 2013), which is in keeping with findings from marketing research (MGH, 2011; Mohamud, 2012). Almost a half of respondents in the US and the most populous European countries reported using a QR code to obtain services or goods. Such bridging could grow to include links to updated stories, online pages where readers could write comments, and mechanisms for

liking and sharing articles.

Other two-dimensional codes such as RFID (Radio-Frequency Identification) can also bridge to augmented reality (AR) or to the "internet of things" (e.g. Seisto et al., 2012; Mensonen, Aikala & Lumby, 2013). AR applications superimpose virtual 3D objects into the user's view (Höllerer & Feiner, 2004), so that the mobile phone or AR glasses augment the offline world (Mensonen et al., 2013). The HP Live Photo mobile application augments photographs with sound. A picture such as President Obama talking to Congress, scanned by a mobile device, allows users to hear the entire speech (Frohlich, 2016). The picture takes readers right to the scene, bringing life to the page (Frohlich et al., 2015).

The main limitation for bridging is its dependence on users possessing digital devices, which are less common among older and disadvantaged groups.

Bonding. Bonding strategies infuse the digital into print. They include embedding of electronics into newspapers itself and provision of other devices such as smart pens, phones, and head-mounted displays (e.g. Luff et al., 2007). The end result is an "augmented" newspaper. *A Lancashire Evening Post* print edition responds to touch, with a button to play audio through headphones (Marshall, 2012), and sound has been embedded in digital photography (Frohlich, 2004). In 2009 *Entertainment Weekly* began distributing videos with the print edition, and *Esquire* and *Popular Mechanics* sent some subscribers a video player accompanying a full-page ad for a pickup truck (Sebastian, 2015). By embedding electronics into print, newspaper take part in a transition to the Internet of things (Gubbi et al., 2003).

Bonding technologies alter some features of paper. Newspapers are no longer directly

suitable for reuse and recycling when embedded with electronics (Kunnari et al., 2009; Bollström et al., 2009). But bonding illustrates how integration can soften the division between the two, fusing their physical forms and technological capabilities while opening a wider range of uses and perhaps increasing frequency of use.

Automation. Innovations through automation, algorithms, and robotics aim for efficiency that may alter the role of the journalist (Carlson, 2015). Journalism students and others have invented algorithms for reporting news content amenable to automated processing such as weather reports, sports results, and stock market updates (Barnhurst, 2016).

Automated content suits routine, numerical reporting, and several companies market the service to news outlets. The *Los Angeles Times* has used software to report on homicide and, in a notable instance, to generate a news story based on information from the US Geological Surve Earthquake Notification Service. *The Washington Post* developed TruthTeller to automate fact-checking of political speeches in real time (Carlson, 2015; Gani & Haddou, 2014). Forbes.com uses Narrative Science to create stories from databases and its own archived content. The Associated Press (AP) uses Automated Insights for company earnings reports. The AP announcement says the new system can write as many as 4,400 of the short articles per quarter, compared to 300 for its staff. Instead of cutting jobs the AP says its staff will focus "on reporting and writing stories about what the numbers mean and what gets said in earnings calls" (Colford, 2014, para. 9). More recently, the use of artificial intelligence systems in tandem with human journalistic judgment is said to have taken the use of data technologies to a new plane, beyond production of stories to original reporting. In another case, *The Wall Street Journal* exposed the private use of company jets by the boss of EMC Corporation, by examining flight records tracked by the Federal Aviation Administration

(FAA). Automation has also been used to assess the newsworthiness of social media content (Stray, 2016).

A sanguine response to automation is that it frees professionals from drudgery so that they can produce higher-grade work (van Dalen, 2012; Gillin, 2014). While algorithmic writing may reproduce formulaic news style, it has so far not matched the empathy that a journalist brings to the task (Greenwood, 2014). Also, it reinforces the divide between those who get only free news and those who benefit from interpretive analysis or "quality" journalism tailored to elite paying subscribers (Singer, 2013).

News automation may also extend to the use of drones, called UAVs (unmanned aerial vehicles) or UASs (unmanned aerial systems) among other terms (Parks, 2014). Drones can document from difficult angles in hard-to-reach places (e.g. a tornado in Alabama), and private spaces (e.g. paparazzi snapping images of celebrity Paris Hilton). Investigative journalists have also used drone video to expose an immigrant detention camp in Australia and a polluting meat plant in Texas (Tremayne and Clarke 2014). Drones can reverse surveillance, so that the synoptic view, with the many watching the few, such as protestors capturing encounters with police, replaces the panoptic view, in which the few serving elite interests watch the many to serve elite interests (Parks, 2014). In the Ukraine a pro-army citizen group released images in the aftermath of the Donetsk Airport attack in early 2015 (Schroyer, 2015).

Journalism and media schools at the University of Nebraska-Lincoln, University of Missouri, and University of Central Lancashire have centers investigating use of drone technology in reporting and distribution. Central European University's SPP Drone Lab in

Budapest is studying the use of drones in estimating crowd size, a bone of contention

between the supporters and opponents of movements (Choi-Fitzpatrick, 2014). Virginia Tech

is testing drones in a joint endeavor with FAA and 10 news companies including Associated

Press, Gannett, Getty Images, E. W. Scripps, *The New York Times,* and *The Washington Post*

(Tobin, 2015).

Automation may divert resources into other developments, so that newspapers change

modes of delivery and reading. In Italy *La Stampa* publishes *Origami,* a premium print

weekly that provides in-depth analysis of a major topic on a physical format that folds out

from letter to poster size. In effect, it offers a new reading path. In the UK *The Independent*

launched *i,* a compact newspaper constructed for easy scanning, which surpassed 277,000 in

daily circulation (Preston, 2015).

Automation in the newspaper world echoes those in other areas of immaterial labor such

as education and entertainment (Taipale et al., 2015). We have bots acting as webmasters on

websites, presenting themselves as humans on social networking sites, and helping

"astroturf" or manipulate online political discussion (Bakardjieva, 2015). Robots also

replacing lawyers for legal searches (Jomati Consultants, 2014) and advising small investors

online, whose aggregate investment is estimated to be about $19 billion (Wesse, 2015).

Transparency. Newspapers have a history of providing unmediated content to users going

back to the full transcripts of political speeches in the nineteenth century. The earliest digital

practice centered on hyperlinks that took readers to a page carrying a new law, official

document, or scientific report (Coddington, 2014; O'Sullivan, 2012). Now they may also link

to digital audio recordings and digital transcriptions of interviews or political speeches and

other online resources.

Sporadic efforts to let audiences look in on production began with the *Spokesman-Review* in Spokane (Smith, 2005), and other newspapers such as *The New York Times, Baltimore Sun,* and *Victoria Advocate* took up the practice (Bunz, 2010; Weber, 2009). The US trials found that webcasts of news producers in action attracted little audience interest and may have inhibited editorial discussion. In Italy, *La Repubblica* carries videos of the main editorial meeting on its website (video.repubblica.it). The extended recording of the editor-in-chief's overview and section editors' take on the day's news reveals how they select and organize the newspaper using information from sources, wire services, and others.

Sharing unedited sources and opening editorial meetings to the public sends a message of openness in contrast to the traditional newsrooms where editors exercise power in private (Bartlett, 2013). They also respond to new demands for more active participation by the audience, which also challenge traditional norms (Hujanen, 2016, Luengo, 2016). In effect, digital technologies bring more transparency to news production, testing the limits of news-making culture.

Conclusions

This review of the technological initiatives of newspapers shows that they continue to innovate and to benefit from innovation by others. It shows that innovation does not pertain exclusively to the digital, but that print and digital can develop and are developing in complementary ways. Observation of newspapers as active participants in innovation shows them to be vividly adaptable organisms, capable of reactive and proactive initiatives that do not fit the caricature of fatally afflicted relics that is now commonplace.

The five processes discussed here – bridging, bonding, migration, automation, and transparency – show that newspapers are agents and beneficiaries as well as subjects of change. They relate to institutional strategies as newspapers develop and adopt technologies but also integrate the wider construction of technology across organization, culture, and audience. Despite declining revenues in key global regions, newspapers are responding and changing just like they have adapted before. The newspaper has demonstrated the capacity to survive through previous periods of innovation, when news cultures accommodated extensive change. As in those eras, newspapers are helping redraw a post-digital media era, in which media are not defined in simplistic binary of digital and analogue, dynamic and static.

The innovations with which newspapers are experimenting go beyond the five processes discussed here. For example, experiments with paywalls that charge for online access continue despite skepticism (see Pickard & Williams, 2014; cf. Newman, 2015). News UK, publisher of *The Times* and *Sunday Times,* announced that its paywall reaped 150,000 digital subscribers even after it increased its subscription to £4 per week (Boyle, 2013). *The New York Times* may more than cover its newsroom costs with digital revenue (Filloux, 2015). Netflix brought change to the economics of television and film consumption, and a similar model via virtual newsstands could apply to the economics of news (Sonderman, 2011; Doctor, 2014; Currie Sivek, 2015). Conceptions of consumption are also changing. Outlets are adapting so that the *topic* replaces the *story* as the core unit (Barnhurst, 2016), and metrics have begun to track degrees of attention rather than dumb page impressions (Thurman, 2014). And print-on-demand has shown potential (Janischewski, 2013). Paywalls, topics, attention, and cross-platform features further test the idea that newspapers are dying, either locked in stasis and in *The Economist's* formulation "ignoring reality" or making feeble adjustments doomed to fail (2006).

In a recent intervention that may mark a wider softening of futurist-flavored digital dualism, the new media theorist and tablet prototype developer Roger Fidler said that he has come to realize that replacing print with digital is more difficult than he had imagined, because of both reading experience and economic concerns (Rosenwald, 2016). What is more widely in play, based on this review, is reciprocal innovation rather than a fight-to-the-death between "old" newspapers and "new" digital technologies. Newspapers are reinventing themselves while accentuating core strengths, even as the concept of convergence has become hackneyed (Merrin, 2014) and a more sophisticated understanding of the medium's materiality is developing.

But, because technologies may matter less than human and organizational change, the future focus of print newspapers must shift from technical developments to journalists and audiences. Media groups, as the next step, need to invest in their most precious resource: journalists. While Zelizer (2015) points out that the decline of newspapers has served as a synecdoche for the wider occupation of journalism, digital transformation has been attended by the downsizing and casualization of the profession recognized in discussions (e.g. Witschge, 2013) that do not rely on a purely technological interpretations but which are marked by a traditional managerialist agenda.

Equally shortsighted is the lack of investment in research on content, as opposed to technology. Publishers need to strengthen and deepen knowledge on the nature of news and the future of content production, and to develop strategies to take advantage of the digital. This is the second, necessary step for print imagining a new model. At the heart of it all is the question of how to design a new relationship with readers incorporating the audience into

news practice and production and into the narrative landscape of print (Barnhurst, 2016). From the existing research on reading on paper and digitally an important lesson emerges: "Probably today there is a reversal of the asymmetry of reading and writing in favor of the latter. After centuries in which people were essentially readers, now they are mainly writers" (Fortunati & Vincent, 2014, p.47). This should suggest further reflections on the relationship between print newspapers and readers, given that print remains, for the most part, a unidirectional medium. Affording readers the power to comment, suggest or protest is crucial in light of the audience's proclivity to write as well as read.

In Finland, experiments in interactivity are already occurring in order to build stronger ties with audiences (Mensonen, Grenman, Seisto & Vehmas, 2014). The smartphone warrants further investigation, especially since it is serves as a bridging device between QR codes and online sources (Westlund, 2008). Social media also deserve further investigation because they model ways to direct users to content, enabling sharing and generating a multiplier effect. Such research will be most relevant to the redesign and repositioning of print newspapers as material artifacts that meet the needs of today's mobile and personal lifestyles. This might involve making print newspapers more readable on the move, for example, by changing the size of editions and including bridging elements such as QR codes or their successors.

The current conditions affecting newspapers are emblematic of print generally, and the rhetoric of the failing newspaper extends to the book. This sector too has been troubled by over-simplified interpretations and forecasts. If the newspaper can overcome the current confusion and acquire sound knowledge and understanding to elaborate a successful media model, which capitalizes on its materiality, books also may benefit.

References

Anderson, C. W., E. Bell and C. Shirky. 2013. *Post industrial journalism: Adapting to the present*. New York: Tow Center for Digital Journalism.

Anderson, C.W. and J. De Maeyer. 2015. Objects of journalism and the news. *Journalism* 16(1): 3–9.

Bakardjieva, M. 2015. Rationalizing sociality: An unfinished script for socialbots. *The Information Society* 31:244–256.

Barnhurst, K. G. 2016. *Mister Pulitzer and the Spider: Modern news from realism to the digital.* Urbana, IL: University of Illinois Press.

Barthel, M. 2016. Around half of newspaper readers rely only on print edition. Pew Research Center. http://www.pewresearch.org/fact-tank/2016/01/06/around-half-of-newspaper-readers-rely-only-on-print-edition (accessed October 29, 2016).

Barthes, R. 1975. *The pleasure of the text.* New York: Hill and Wang.

Bartlett, R. 2013. Behind the dcenes at Gruppo Editoriale L'Espresso. *journalism.co.uk.* https://www.journalism.co.uk/news/focus-on-italy-behind-the-scenes-at-gruppo-editoriale-l-espresso/s2/a554306 (accessed October 29, 2016).

Bennett, J. 2009. *Vibrant matter: A political ecology of things*. Durham, NC: Duke University Press.

Benton, J. 2014. Warren Buffett on newspapers: '_____.' *NiemanLab*. http://www.niemanlab.org/2014/03/warren-buffett-on-newspapers-_____/ (accessed December 06, 2016).

Blair, C. 2014. CNET's plunge into print. *American Journalism Review*. http://ajr.org/2014/12/10/cnets-plunge-print/ (accessed December 06, 2016).

Boczkowski, P.J., 2015. The material turn in the study of journalism: Some hopeful and cautionary remarks from an early explorer. *Journalism* 16(1): 65–68.

Bollström, R., A. Määttänen, D. Tobjörka, P. Ihalainen, N. Kaihovirta, R. Österbacka, J. Peltonen and M. Toivakka. (2009). A multilayer coated fiber-based substrate suitable for printed functionality. *Organic Electronics* 10: 1020–1023.

Borden, S.L., and C. Tew. 2007. The role of journalist and the performance of journalism: Ethical lessons from "fake" news (seriously). *Journal of Mass Media Ethics* 22 (4):300–314.

Boyle, D. 2013. Times claims subscriber boost: 'You can charge a premium and still increase circulation.' *Press Gazette*. http://www.pressgazette.co.uk/times-titles-hit-350000-printonline-subscribers-you-can-charge-premium-and-still-increase (accessed October 29, 2016).

Brüggemann, M., E. Humprecht, R. Kleis Nielsen, K. Karppinen, A. Cornia, and F. Esser. 2016. Framing the newspaper crisis. *Journalism Studies* 17 (5):533-551.

Bruns, A. 2011. News produsage in a pro-am mediasphere: Why citizen journalism matters. In *News online: Transformations and continuities, ed.* G. Meikle and G. Redden, 132–147. Basingstoke, UK: Palgrave Macmillan.

Bunz, M. 2010. New York Times publishes a daily video from its newsroom. *The Guardian.* http://www.theguardian.com/media/pda/2010/mar/23/new-york-times-timescast (accessed November 11, 2015).

Burrell, I. 2014. The mag trade: Net-a-Porter's new glossy magazine set to be a serious rival to Vogue. *The Independent.* http://www.independent.co.uk/news/media/press/the-mag-trade-netaporters-new-glossy-magazine-set-to-be-a-serious-rival-to-vogue-9113140.html (accessed October 29, 2016).

Carlson, M. 2015. The robotic reporter. *Digital Journalism* 3: 416–431.

Carpignano, P. 1999. The shape of the sphere: The public sphere and the materiality of

communication. *Constellations*, 6(2): 177–189.

Carr, D. 2014. When the forces of media disruption hit home. *The New York Times*.

http://www.nytimes.com/2014/12/01/business/media/when-the-forces-of-disruption-hit-

home.html (accessed December 06, 2016).

Choi-Fitzpatrick, A. 2014. SPP Drone Lab crowd estimation methodology. YouTube video.

https://youtu.be/CTH5zDJdSuk (accessed December 06, 2016).

Chyi, H.I. and O. Tenenboim. 2016. Reality Check. *Journalism Practice*

doi:10.1080/17512786.2016.1208056.

Clark, A. 2009. Seattle mourns the last day of its venerable Post Intelligencer. *The Guardian*.

http://www.theguardian.com/media/2009/mar/17/seattle-post-intelligencer-last-day

(accessed December 06, 2016).

Coddington, M. 2014. Normalizing the hyperlink. *Digital Journalism* 2: 140–155.

Colford, P. 2014. A leap forward in quarterly earning stories. The Definitive Source,

Associated Press. http://blog.ap.org/2014/06/30/a-leap-forward-in-quarterly-earnings-

stories/ (accessed December 06, 2016).

Daniel, R. and K. Hagey. 2012. Turning a page: Newsweek ends print run. *The Wall Street

Journal*.

http://www.wsj.com/articles/SB10001424127887324660404578201432812202750

(accessed December 06, 2016).

Das, A. 2014. At Papers, Berkshire Rewrites its Script. *The Wall Street Journal*.
http://www.wsj.com/articles/SB10001424052702304361604579292721064856870
(accessed May 1, 2015).

Doctor, K. 2014. The newsonomics of Newsweek's pricey relaunch. *NiemanLab*.

http://www.niemanlab.org/2014/03/the-newsonomics-of-newsweeks-pricey-relaunch/

(accessed December 06, 2016).

Downie, L. and M. Schudson. 2009. *The reconstruction of American journalism.* New York: Columbia University Graduate School of Journalism.

.Economist. 2006. Who killed the newspaper? The most useful bit of the media is disappearing. A cause for concern, but not for panic. *The Economist* 380(8492):9–10.

Ekdale, B., J. B. Singer, M. Tully, and S. Harmsen. 2015. Making change: Diffusion of technological, relational, and cultural innovation in the newsroom. *Journalism and Mass Communication Quarterly* 92:938–958.

Farinosi, M., C. Lim and J. Roll. 2016. Book or screen, pen or keyboard? A cross-cultural sociological analysis of writing and reading habits basing on Germany, Italy and the UK, *Telematics and Informatics 33*: 410-421.

Filloux, F. 2015. The NYTimes could be worth $19bn instead of $2bn. *Monday Note.* http://www.mondaynote.com/2015/02/15/the-nytimes-could-be-worth-19bn-instead-of-2bn/ (accessed December 06, 2016).

Fortunati, L., M. Deuze, and F. De Luca. 2014. The new about news: How print, online, free, and mobile coconstruct new audiences in Italy, France, Spain, the UK, and Germany. *Journal of computer-mediated communication* 19(2): 121–137.

Fortunati, L. and J. Vincent. 2014. Sociological insights on the comparison of writing/reading on paper with writing/reading digitally. *Telematics and Informatics* 31 (1): 39–51.

Fortunati, L, S. Taipale and M. Farinosi. 2015. Print and online newspapers as material artefacts. *Journalism* 16 (6):830 –846.

Frohlich, D.M. 2004. *Audiophotography: Bringing photos to life with sounds.* Dordrecht, the Netherlands: Kluwer Academic.

Frohlich, D. 2016. *Designing interactive newsprint.* Manuscript in preparation.

Frohlich, D., P. Egglestone, and J. Rogers. 2015. Interactive newsprint project: User study. Paper presented at the COST Action FP1104, Zagreb, Croatia, March.

Gani, A. and L. Haddou. 2014. Could robots be the journalists of the future? *The Guardian*. http://www.theguardian.com/media/shortcuts/2014/mar/16/could-robots-be-journalist-of-future (accessed December 06, 2016).

Gillespie, T., P. J. Boczkowski and K.A. Foot, eds. 2013. *Media technologies: Essays on communication, materiality, and society.* Cambridge, MA: MIT Press.

Gillin, P. 2014. The Bots Are Coming! *Newspaper Deathwatch*. http://newspaperdeathwatch.com/the-bots-are-coming/ (accessed December 06, 2016).

Gourarie, C. 2015. Print is the new 'new media.' *Columbia Journalism Review Business of News.* http://www.cjr.org/business_of_news/back_in_print.php (accessed December 06, 2016).

Greenwood, S. 2014. What will partly work – robots and journalism. *What Worked, What Didn't*. http://whatworkedwhatdidnt.com/why-robots-can-be-useful-reporters-but-rubbish-journalists/ (accessed December 06, 2016).

Gubbi J., R. Buyya, S. Marusic, and M. Palaniswami. 2003. Internet of things (IoT): A vision, architectural elements, and future directions. *Journal of Future Generation Computer Systems* 29*:* 1645–1660.

Hall, S. 1973. *Encoding and decoding in the television discourse*. Birmingham, UK: Centre for Cultural Studies, University of Birmingham.

Harper, R. 2010. *Texture: Human expression in the age of communications overload.* Cambridge, MA: MIT Press.

Hedges, C. 2010. *Empire of illusion: The end of literacy and the triumph of spectacle*. New York: Nation Books.

Höllerer, T., and S. Feiner. 2004. Mobile augmented reality. In *Telegeoinformatics: Location-based computing and services,* ed. H. Karimi and A. Hammad, 187–220. London: Taylor and Francis.

Hujanen, J., 2016. Participation and the blurring values of journalism. *Journalism Studies* 17 (7):871–880.

Husni, S. 2015. Newsweek one year after the print re-launch: Profitable and self sustaining. *Mr. Magazine*. https://mrmagazine.wordpress.com/2015/03/04/newsweek-one-year-after-the-print-re-launch-profitable-and-self-sustaining-the-mr-magazine-interview-with-newsweeks-editor-in-chief-jim-impoco/ (accessed December 06, 2016).

Janischewski, C. 2013. Meganews kiosk prints magazines and newspapers on demand. *WAN-IFRA*. http://www.wan-ifra.org/articles/2013/07/22/meganews-kiosk-prints-magazines-and-newspapers-on-demand (accessed December 06, 2016).

Johns, A. 2015. Recursive Historiographical Work and the Responsibility of the Historian (Podcast). *Culture Machine Live*. http://culturemachinepodcasts.podbean.com/e/recursive-historiographical-work-and-the-responsibility-of-the-historian-adrian-johns-1428923430/ (accessed December 16, 2016)

Jomati Consultants. 2014. *Civilisation 2030: The near future for law firms*. London: Jomati Consultants.

Jones, J., and L. Salter, L. 2012. *Digital journalism*. London: Sage.

Kortelainen, T. 2015 Reading format preferences of Finnish university students. In *European Conference on Information Literacy,* pp 446–454. Berlin: Springer

Kunnari, E., J. Valkama, M. Keskinen, and P. Mansikkamäki. 2009. Environmental evaluation of new technology: Printed electronics case study. *Journal of Cleaner Production* 17: 791–799.

Landow, G.P. 1997. *Hypertext 2.0: the convergence of contemporary critical theory and technology.* Baltimore, MD: Johns Hopkins University Press.

Lewis, H. 2016. Post-truth politics. *Nieman Reports*. http://niemanreports.org/articles/post-

truth-politics/ (accessed December 06, 2016).

Lin, C., M.B. Salwen, and R.A. Abdulla. 2005. New wine in an old bottle? Online news as a functional substitute for offline. In *Online News and the Public*, ed. B. Garrison, Driscoll P. D. and M. B. Salwen, 221–236. Mahwah, N.J: Erlbaum.

Luengo, M. 2016. When codes collide: Journalists push back against digital desecration. In *The crisis of journalism reconsidered: democratic culture, professional codes, digital future,* ed. J. C. Alexander, E. Butler Breese, and M. Luengo, 119–134. Cambridge, UK: Cambridge University Press.

Ludovico, A. 2012. *Post-digital print: The mutation of publishing since 1894.* Eindhoven, the Netherlands: Onamatopee.

Luff, P., G. Adams, W. Bock, A. Drazin, D. Frohlich, C. Heath and E. Zeller, E. 2007. Augmented paper: Developing relationships between digital content and paper. In *The disappearing computer*, ed. N. Streitz, A. Kameas, and I. Mavrommati, 275–297. Berlin: Springer.

Mackay, W. E., and A.-L. Fayard 1999. Designing interactive paper: Lessons from three augmented reality projects. In *Proceedings of IWAR'98, International Workshop on Augmented Reality*, 81–90. Natick, MA: A. K. Peters.

Marshall, S. 2012. Prototype of 'smart' newspaper that plays audio released. *journalism.co.uk*. https://www.journalism.co.uk/news/researchers-release-prototype-of-smart-newspaper-that-plays-audio/s2/a550344/ (accessed December 06, 2016).

McChesney, R. W. 2014. Be realistic, demand the impossible: Three radically democratic internet policies. *Critical Studies in Media Communication* 31 (2): 92–99.

McLuhan, M. 1964. *Understanding media: The extensions of man.* New York: McGraw-Hill.

Mensonen, A., M. Aikala, and N. Lumby. 2013. Consumer attitudes towards AR applications in Finland and Canada. *Journal of Print and Media Technology Research* 2: 245–253.

Mensonen, A., K. Grenman, A. Seisto, and K. Vehmas. 2014. Novel services for publishing sector through co-creation with users. *Journal of Print Media Technology Research* 3: 277–285.

Merrin, W. 2014. *Media studies 2.0.* New York: Routledge.

MGH. 2011. *QR code survey.* Baltimore, Md. http://mghus.com/lp/qr-codes/

Milner, A. 2014. Newsweek back in print again with very different owners. *Liberty Voice.* http://guardianlv.com/2014/03/newsweek-back-in-print-again-with-very-different-owners/ (accessed December 06, 2016).

Milosevic, M., and T. Henriksson. 2015. *World press trends 2014*. Paris: WAN-IFRA.

Mitchell, A., J. Gottfried, M. Barthel and E.Shearer. 2016. *The modern news consumer.* Washington, DC: Pew Research Center.

Mohamud, A. 2012. QR code usage among European smartphone owners doubles over past year. *Comscore Insights*. https://www.comscore.com/Insights/Press-Releases/2012/9/QR-Code-Usage-Among-European-Smartphone-Owners-Doubles-Over-Past-Year. (accessed December 06, 2016).

Myer, M. 2014. Brick by brick. *Columbia Journalism Review.* http://www.cjr.org/cover_story/washington_post_jeff_bezos.php (accessed December 06, 2016).

Nadler, A., and M. Vavrus. 2015. Critical voices in the future of news debates. *Communication Review, 18* (2): 71–81.

Neff, J. 2015. Powa does away with QR codes to allow instant orders. *Advertising Age.* http://adage.com/article/digital/powa-qr-codes-instant-orders/301782/ (accessed December 06, 2016).

Newman, N. 2015. *Digital news report*: *Tracking the future of news*. Oxford, UK: Reuters Institute for the Study of Journalism.

Olivotto, R. 2013. QR codes analisi e sviluppi futuri. Unpublished master's thesis, University of Udine, Italy.

O'Sullivan, J. 2012. Challenging values: the 'good' journalist online. In *The Handbook of Global Online Journalism*, ed. E. Siapera and A. Veglis, 39–58. Oxford, UK: Wiley-Blackwell.

Parks, L. 2014. Media, hot & cold: drones, infrared imagery, and body heat. *International Journal of Communication* 8: 2518–21.

Pickard, V., and A.T. Williams. 2014. Salvation or folly? *Digital Journalism* 2:195–213.

Ponsford, D. 2013. Print is the future for local journalism says founder of new weekly newspaper. *Press Gazette*. http://www.pressgazette.co.uk/print-future-local-journalism-says-founder-new-weekly-macclesfield-today (accessed December 06, 2016).

Preston, P. 2015. If you're looking for a way for print to prosper, the i may have it. *The Guardian*. http://www.theguardian.com/media/2015/oct/25/independent-circulation-print-prosper-i-may-have-it (accessed December 06, 2016).

Radcliffe, D. 2013. Hyperlocal and happy to be in print. *BBC College of Journalism*. http://www.bbc.co.uk/blogs/collegeofjournalism/entries/a6ef218c-09da-3cd9-b1fa-b8e987122046 (accessed December 06, 2016).

Ramsden, A. 2010. The level of student engagement with QR codes: Findings from a cross institutional survey [Working paper]. Bath, UK: University of Bath.

Robinson, S. 2011 Convergence crises: News work and news space in the digitally transforming newsroom. *Journal of Communication* 61:1122–1141.

Rosenwald, M. 2016. Print Is Dead. Long Live Print. *Columbia Journalism Review*. http://www.cjr.org/special_report/print_analog_comeback.php (accessed December 07, 2016).

Schroyer, M. 2015. PSDJ creates 3D models and maps of war-ravaged Donetsk airport, using citizen groups' drone video. *Professional Society of Drone Journalists*.

http://www.dronejournalism.org/news/2015/1/psdj-creates-3d-models-and-maps-of-war-ravaged-donetsk-airport-using-citizen-groups-drone-video (accessed December 06, 2016).

Schudson, M. 2015. What sorts of things are thingy? And what sorts of thinginess are there? Notes on stuff and social construction. *Journalism* 16 (1): 61–64.

Sebastian, M. 2015. Chevy runs digital video ads in print. advertising age (Yes, you read that right). *Advertising Age.* http://adage.com/article/media/chevy-print-ads-esquire-popular-mechanics-include-video/298085/ (accessed December 06, 2016).

Sehl, K. 2016. "Read the fine print: Premium passengers prefer paper newspapers on long haul." *Apex Aero*. http://apex.aero/2016/09/20/premium-passengers-prefer-paper-newspapers-long-haul (accessed December 06, 2016).

Seisto, A., M. Aikala, R. Vatrapu, and T. Kuula. 2012. Augmented reality as a technology bringing interactivity to printed products. In *Advances in printing and media technology. Proceedings of the 39th international research conference of IARIGAI,* ed. N. Enlund and M. Lovreček, 271–279. Darmstadt, Germanty: International Association of Research Organizations for the Information, Media and Graphic Arts Industries.

Sellen, A.J. and R.H. Harper. 2002. The myth of the paperless office. Cambridge, MA: MIT Press.

Shirky, C. 2008. *Here comes everybody: The power of organizing without organizations*. New York: Penguin Books.

Singer, J. B. 2013. The ethical implications of an elite press. *Journal of Mass Media Ethics* 28: 203–216.

Sivek, S.C. 2015. 'Netflix for magazines' services explain why they're not doomed. PBS MediaShift. http://www.pbs.org/mediashift/2015/03/netflix-for-magazines-services-explain-why-theyre-not-doomed/ (accessed December 06, 2016).

Smith, S.A. 2005. A newsroom's fortress walls collapse. *Nieman Reports.*

http://niemanreports.org/articles/a-newsrooms-fortress-walls-collapse/ (accessed

December 06, 2016).

Sonderman, J. 2011. Why Apple's virtual Newsstand is driving a surge in magazine,

newspaper iPad app subscriptions. *Poynter Institute*. http://www.poynter.org/news/media-

innovation/150199/why-apples-virtual-newsstand-is-driving-a-surge-in-magazine-

newspaper-ipad-app-subscriptions (accessed December 06, 2016).

Stray, J. 2016. The age of the cyborg. *Columbia Journalism Review*.

http://www.cjr.org/analysis/cyborg_virtual_reality_reuters_tracer.php (accessed

December 01, 2016).

Taipale, S. 2014 The affordances of reading/writing on paper and digitally in Finland.

Telematics and Informatics 31 (4): 532–542.

Taipale, S. 2015. Bodily dimensions of reading and writing practices on paper and digitally.

Telematics and Informatics 32 (4): 766–755.

Taipale, S., J. Vincent, L. Fortunati, B. Sapio, and G. Lugano. 2015. Introduction: Situating

the human in social robots. In *Social Robots from a Human Perspective*, ed, J. Vincent, S.

Taipale, B. Sapio, G. Lugano, and L. Fortunati, 1–7. London: Springer

Tameling, K., and M. Broersma. 2013. De-converging the newsroom: Strategies for

newsroom change and their influence on journalism practice. *International

Communication Gazette* 75 (1): 19–34.

Thurman, N. 2014. Newspaper consumption in the digital age. *Digital Journalism 2:* 156–

178.

Tobin, C. 2015. News media coalition announces partnership to test small news drones at

FAA test site. *Holland & Knight*. http://www.hklaw.com/news/News-Media-Coalition-

Announces-Partnership-to-Test-Small-News-Drones-at-FAA-Test-Site-01-15-2015/

(accessed December 06, 2016).

Tremayne, M., and A. Clark. 2014. New perspectives from the sky: Unmanned aerial vehicles and journalism. *Digital Journalism 2:* 232–246.

van Dalen, A. 2012. The algorithms behind the headlines. *Journalism Practice* 6: 648–658.

Waller, R. 2012. Graphic literacies for a digital age: The survival of layout. *The Information Society* 28: 236–252.

Weber, P.J. 2009. Live webcasts open up newsrooms. *Victoria Advocate.* https://www.victoriaadvocate.com/news/2009/jul/20/newsroom_webcast_072009_58744/ (accessed December 06, 2016).

Wesse, R. 2015. The algorithm who advised me. *CFA Institute Magazine* 26: 37–38.

Westlund, O. 2008. From mobile phone to mobile device: News consumption on the go. *Canadian Journal of Communication* 33: 443–463.

Wiley, S.B.C. and J. Packer, eds. 2012. *Communication matters: materialist approaches to media, mobility and networks.* London: Routledge.

Witschge, T. 2013. Transforming journalistic practice: A profession caught between change and tradition. In *Rethinking journalism: Trust and participation in a transformed news landscape,* ed. M. J. Broersma and C. Peters, 160–172). London: Routledge.

White, J. V. 1974. *Editing by design: word-and-picture communication for editors and designers.* New York: R. R. Bowker.

Zelizer, B. 2015. Terms of choice: Uncertainty, journalism, and crisis. *Journal of Communication* 65: 888–908.

Notes

[1] Kevin Barnhurst had contributed substantially to this paper, up to a late stage of its completion, before his sudden passing.

[2] With regard to the current decline-of-newspapers discourse, Brüggemann et al., 2016 point out that it is based on a perspective centered on corporate and US interests.

[3] The proponents of newspapers-in-decline narrative also overlook digital technologies for printing newspapers, which predate the development of online news. The newspapers adopted these digital technologies (Waller, 2012). Later, newspapers were among the first information organizations to move online.

[4] The current outbreak of concerns about entering a social media-driven 'post-truth' era (e.g. Lewis, 2016) was presaged in fake news by Jon Stewart and other comedians (Borden and Tew, 2007).