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A Liminal Press

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A LIMINAL PRESS

Situating news app designers within a field of networked news production

Mike Ananny and Kate Crawford

In this project we use interview data from the United States and Europe to map field dynamics within an emerging techno-journalistic space of news app design. We describe this space in terms of institutional theory and field-level studies of news production and report on a series of interviews we conducted with senior news app designers and lead programmers. Part of a larger empirical study on mobile news app design, we focus here on analyzing how designers understand their work in relation to journalism as a profession and process, and how they see themselves as like or unlike others in their field. We conclude with reflections on how these designers are helping to constitute the organizational field of news app design by creating and sustaining boundary infrastructures that constitute an emerging “liminal press.”

KEYWORDS institutions; mobile news apps; networked press; technology design

Introduction

Contemporary online news emerges from no single type of actor or institution. While much of online news content production is still dominated by “traditional,” “legacy,” or “mainstream” news organizations (Pew Research Center 2013), the means by which news circulates is increasingly shaped by networked forces, new people and priorities. Some news organizations use social media and crowdsourcing tools to collaborate with audiences (Carvin 2013; Pro Publica 2013) while others are skeptical of participation’s value to journalism (Singer 2010; Nielsen 2013) and try to limit its impact on “professional” journalism (Broersma and Peters 2012; Lewis 2012). Others are trying to regain lost print advertising revenues through pay walls and digital subscriptions, while others pursue philanthropic funding, tax-exempt statuses, or crowd-funded revenue (Aitamurto 2011; Carvajal, Garcia-Aviles, and Gonzalez 2012; Pickard and Williams 2013). Others attempt to influence online news production by training new data-driven “programmer-journalists” (Parasie and Dagiral 2013); using sophisticated analytical tools to measure online audiences (Anderson 2011a); giving programmers access to internal news content to encourage new application development (Aitamurto and Lewis 2012; Ananny 2013); or sponsoring hybrid “hacks and hackers” cultures (Lewis and Usher 2013). None of these sites exactly mimics a traditional, mainstream, or legacy news organization; rather, taken together, they represent new types of news work that span

multiple professional identities, information ideologies, and assumptions about how news and public life intersect.

In this paper, we trace one type of actor in this field of online journalism: creators of mobile news apps. We interviewed senior designers and lead programmers in Boston, New York, Silicon Valley, San Francisco, Helsinki, and Cambridge, UK to understand how their practices, design materials, and interactive systems sit within the broader field of networked news production. We see these app creators as “interstitial designers”—creators of novel news experiences that live in between news content production and consumption. They do not source original content as traditional news organizations do, nor do they simply publish content in the way that wire services have historically done. Through a set of interface and algorithm design decisions, they create conditions under which audiences encounter and circulate personalized, aggregated collections of content designed to match their individual preferences. Here we argue that such designers and decisions constitute an emerging “liminal press”: a set of field-level relationships among actors who may not self-identify as journalists but nonetheless define the conditions under which news is created and circulates.

The focus of our interviews was how the designers and programmers understood their work in relation to contemporary journalism and how they saw themselves in relation to other actors within the field of networked news production. Their insights provide deeper context about the roles of these actors, their boundary work, and their understandings of the field of news app design within networked news production.

News Production and the Field of Online Journalism

News production is undergoing a considerable transformation, but there is no single way of understanding the “crisis” (Siles and Boczkowski 2012). Rather, there are competing visions of how news should be made and valued online. Sociologists of news production (Schudson 2000; Anderson 2012) argue that distributed information practices among people who may not see the extent of their interrelatedness are creating a “hybrid” media system that makes meanings, sanctions behavior, legitimizes practices, and signals quality (Chadwick 2013).

This hybrid system provokes new questions. Should the story be the “atomic unit” of news simply because it is what search engines index by default, or is some other metric more appropriate (Fest 2008)? How, if at all, should journalists distinguish themselves from the norms of social media users and the affordances of social network sites as they research and publish stories (Ananny 2014; Schifferes et al. 2014)? When do personalized news algorithms help attract and retain readers (Thurman and Schifferes 2012b; Van Aelst, Sheafer, and Stanyer 2012)? When do they exacerbate the long-standing divide between what journalists and political theorists think citizens need to know and what consumers as news customers want to know (Pariser 2011; Boczkowski and Mitchelstein 2013)? Finally, what kinds of governance structures should accompany algorithmic news platforms, if any (Crawford and Lumby 2013; Gillespie 2014)?

In these competing visions of the press and news work, we can see the contemporary, networked press is not as a single entity with recognizable boundaries and agreed upon norms (if such a press ever existed at all; Schudson 2012), but instead as “loosely coupled arrays of standardized elements” (DiMaggio and Powell 1991, 14).

Networked forms of news organization understand and trace these elements differently from markets and firms. Markets describe the news business as standardized exchanges of commodified goods (e.g., selling space to advertisers and newspapers to readers at fair market values) while firms see the news business as relationships among highly predictable actors with specialized knowledge, organized into hierarchies that can predict and mitigate risk (e.g., investigative journalists tending to be experienced reporters trusted by their editors, and news organizations limiting their libel exposure by employing teams of specialized journalism lawyers). In contrast, *networked* forms of organization (Powell 1990) tend to see institutions as relationships among actors who cooperate over long periods of time (seeing news as other than a set of short-term market transactions between content producers and consumers); share knowledge and learn from each other (adapting journalistic techniques according to what other network members are doing); and thoughtfully resist or integrate new types of resources quickly (critiquing and perhaps adopting information technologies of other journalists and non-journalists alike).

That is, instead of thinking about the press as an institution that lives within the norms of organizations like *The New York Times* (or a local newspaper), as a set of transactions in which readers purchase content and newspapers sell space, or as skills and ethics taught by journalism schools and policed by professional bodies, the press itself might better be thought of as *networked* relationships, knowledge, and artifacts that together define the conditions under which information is produced and circulates. To be sure, such a network is not simply value-neutral exchanges of skills and technologies—there are hard questions to ask beyond the scope of this paper about who participates in the network and what kinds of public life it can sustain. But seeing news in these networked terms can help identify how new types of journalism organizations emerge (Padgett and Powell 2012), and what attendant, normative critiques they require. Beyond trying to understand the civic contributions of individual news organizations or their market-based exchanges, we might see the networked press as a set of “networked forums” (Turner 2006): loosely organized collectives of mutually relevant actors who convene and overlap to create conditions under which news is created and circulated.

Empirical relationships among these actors are starting to emerge. For example, journalists seem to use social network sites and value user comments differently, depending on their age and years of reporting experience (Reich 2011; Robinson 2011; Gulyas 2013; Nielsen 2013). Although people still mostly encounter news through broadcast television (Pew Research Center 2013), when they do access online news it is increasingly through search engines, personalization algorithms, and online social networking practices that automatically rank and circulate stories (Bucher 2012; Thurman and Schifferes 2012a, 2012b; Beam 2013; Singer 2013; Willson 2013). Indeed, proprietary algorithms are increasingly governing the production and circulation of news content, determining its visibility, and organizing news audiences using quantified metrics (Carlson 2007; Anderson 2011b; van Dalen 2012). These findings start to show online news as an institution with *field*-level dynamics and distributed, relational actors—resembling networked forms of organization significantly different from the markets and firms that have historically structured the production and circulation of news.

The Networked Press and Interstitial Designers

In this new field, the set of actors we call “interstitial designers” have not been well studied. They do not work within traditional newsrooms, write original stories, engage in data journalism or computer-assisted reporting, or create the social networks through which people encounter news. Instead, they are intermediary technologists creating mobile apps with personalization schemes, ranking algorithms, and novel user experiences for connecting online audiences with news content. They are simultaneously algorithm designers, curators, and editors who implement user preferences using a set of rules and heuristics that are like editorial judgments yet are distinct from how these have traditionally been understood. They depend highly on news organizations to produce content that their users will find valuable, acting as second-order publishers who curate and aggregate content, but they see this value through the lens of their own identities as software entrepreneurs and enterprise coders creating products designed to exist outside of news organizations.

Part of understanding these actors is appreciating how they are situated within the field of forces that govern networked news production—what kind of participants they are in the “network forums” that produce and circulate news. In the spirit of Chadwick’s (2013) study of how a wide variety of actors reflexively sit within the “hybrid field” of political communication, we sought to discover how these interstitial designers see *themselves* within the field of networked journalism—how they understand their relationships to journalism as a profession and process, and how they associate and differentiate themselves from other interstitial designers.

We asked news apps designers and developers to share their understandings of what news is, and how people engage with news. These understandings, in turn, inform their app designs, becoming in-built perspectives on why news is important, how it should circulate, and what distinguishes mobile and tablet platforms from other news delivery formats (like newspapers and websites). News apps are effectively *co-articulated* across different industrial spheres, including the media, technology (particularly start-up cultures), and venture capital sectors. This was particularly clear for the designers living in Silicon Valley and San Francisco. The everyday practice of designing and building these apps spans several modalities, including ideas about what innovation means in the ecology of technology and media start-ups, what will make money, and what will draw attention and maintain a user base. We focus this paper on the answers our interviewees gave to two specific questions: How do they define journalism, as a process and a profession? How are they like or unlike other actors in the space, both traditional news media and other app-based competitors?

Field Sites and Methods

We conducted nine semi-structured interviews during an eight-month period from October 2011 to May 2012. The companies included were Storify, Zite, Google News, Emporia, AOL Editions, News.Me, Fluent News, and Scoopinion. We recruited participants by researching popular news apps on tablets and mobile platforms, and approaching their design teams via email. Seven of the nine interviews were conducted in person, at workplaces in San Francisco, Silicon Valley, New York City, Boston, and

Cambridge, UK. Two were completed using Skype. Apart from Scoopinion (based in Finland), all companies were based in the United States and United Kingdom. Interviews averaged at 1.5 hours long, with the shortest being 40 minutes and the longest being 2 hours. Participants ranged from senior designers and lead programmers in small smart-ups to news design leads in large software companies.

To contextualize our interviews, we developed a corpus of public news stories about the news apps and their organizations. The corpus was formed by searching for all stories which discussed the news apps which we were studying, as well as several which were unavailable for interview (including Flipboard, Pulse, Trove, FLUD, Google Currents, and Yahoo Livestand). A sub-corpus was selected by filtering to include only those that had a substantive discussion of the app or an interview with senior designers and executives. This method reduced the corpus to a sample of 355 media items (news articles, blog posts, videos, app reviews). The aim for this corpus was not to compare how public statements differed from those made in interviews but, rather, to examine how news app affordances were described. This corpus acts as a background to this paper, and has informed the arguments offered here.

Finally, we also downloaded all the apps to better understand a user's experience, experimenting with the interfaces and exploring the possible options. This informed our interviews and discussions with designers, and also grounded our understandings of the materials and products created by our interviewees.

The interviews began with a *tour of the interface* of the designer's news app. We asked questions about how the app works, how users experience reading news through the app, and why some design decisions were made over others. We asked about the app and company's *origin stories*: when and why they decided to create the app, which market niche was it designed to fill, and who were considered to be its competitors. Finally, we asked about how they understood today's *news ecology*: how news is changing, the role of news personalization and aggregation in news, what defines a "good source" and, finally, what advice they would give to other news app designers.

All interviews were transcribed and we then coded the transcripts across four main categories: their understanding of the news's institutional field; their particular corporate contexts; what news and views of news are visible with their app; and how their app's algorithm was built and functions.

A Note About Timeframe

The news app industry changes quickly, while the academic work of interviewing, analyzing, and writing moves more slowly. Much has changed in the news ecosystem since we completed our interviews in 2012. Nonetheless, we think this research points to wider operating principles in news app design and conceptualization, and the confluence of actors and logics in this space: software logics, journalistic logics, business logics, and civic logics. Our aim is to point to the way the understanding of news shifts depending on the industry that is delivering it, and the ideology undergirding the production of news platforms, which determines what demarcates news from other categories. At the most granular level, these interviews give us insights into the everyday processes, concerns, and self-definitions of app designers and what they care about, as

well as what they believe readers will care about. As Mike McCue, Flipboard's CEO, described:

[Flipboard is] a mix of what's going on in the world and what's going on in your world, fused together. And it might seem weird that I'm looking at a picture of my daughters, and then the next flip I'm reading a story about Iran. But to me as a reader, when I'm standing in line waiting to get my coffee, those things are what I care about. (cited in Carmody 2011)

Findings

For the purposes of this paper, which analyzes how app designers understand their work and materials in relation to the field of networked news production, we focus on the first category of interview data: how interviewees understand the field of news production. We further narrow this category to how interviewees understand journalism as a profession and process, and how they see themselves and their organizations as like or unlike others in the field of journalism (including other app designers or actors).

Relationship to Journalism as a Profession and Process

Our participants perceive themselves as differing significantly from "what the news industry is still doing. They're putting humans on top ... who have a very high standard ... for how they're telling [a] story and how they're delivering it" (Fluent News). These designers see code, personalization algorithms, and relational databases—not humans—as defining their roles in contemporary news production.

Three themes emerged in how participants understood their work as journalism: *organizing information*; *meeting demands*; and *interpreting transparency*. A fourth theme arose as participants said that their work was, in fact, not about news production at all, *eschewing journalism*.

Organizing information. Most broadly, these designers were motivated to organize information, because "it's important to democracy that people know what is going on in the world" (Storify). These app designers sort and package pre-existing news content, assuming that the information they index spans a sufficiently broad range of perspectives, and that their mission is somehow related to a healthy democracy. Indeed, the threat they see posed to contemporary democratic life is that online environments consist of too much poorly organized, ephemeral information that is difficult for users to find and make sense of on their own. People are

Tweeting back and forth using a hash tag, answering people's questions, and ... there's no way you can search for it, easily. And after a week, it's gone. It's impossible to search for it. Using Storify, they can put it back together ... from the noise of all this social media. How can you pull out the things that you want to remember and that are important to preserve? (Storify)

A senior designer on AOL's Editions product agreed with this motivation:

People have information overload, right? So you've got Tweetdeck beeping at you, and Flipboard is always refreshing, and there's always a new story, and there's always—and how do you keep up with all that? There's no way to do that.

The design goal, an Emporia creator stated, is to “make you feel in control of this information deluge ... we wanted to go for this feeling of completion.”

Interstitial designers do not *provide* information but, rather, create opportunities for “sensemaking”—moments and spaces for people to process ambiguity, create plausible meanings (Weick, Sutcliffe, and Obstfeld 2005, 419), and feel in control of the internet's surfeit of data.

Meeting demands. Part of organizing information entails learning and delivering the content that users want to receive—acting as a *personalized* news service that provides only the stories that the reader desires. A Storify co-founder avoids adopting any kind of editorial stance:

What is news? Is it something that's titillating in some way or does it have to actually be important? I mean who are we to judge what is important to who? I don't know that we, as a platform, you should impose some kind of sense of opinion on that.

Indeed, designers seemed to see these as neutral spaces; to the extent that they have *any* editorial perspectives, they are simply reflections of users:

Editions has nothing to prove; it's not slanted any which way. In a way, it doesn't have a voice. It just has some understanding about maybe what people want. It's as vanilla as you want it to be. (AOL-Editions)

The founder of Zite saw such personalization as the natural next step in the news ecosystem's evolution (“in 10 years I would expect almost everything to be personalized”). Indeed, he described Zite as an opportunity to *oppose* news organizations' judgments and educate the press:

No matter what an editor thinks is important, I'm never going to consider a story about Lindsay Lohan important, ever. I just don't want to see that in my feed. So I think that how this transforms media is that it teaches reporters a lot more about what people are talking about, what they should be writing about.

The designers we spoke with understood these demands emerging not only from users' explicitly stated preferences, but also from their position within a set of social and technological actions. A senior executive with Google News described its mission as “help[ing] you discover things that might be of interest to you that aren't resident in your social graph today”—that are suggested by how “you're running queries into Web search.” This is because “we've got a richer set of signals in the social space than we do with Web searching Google News.”

Meeting demand, then, is not simply giving users what they *say* they want—it is these services delivering what they *think* users want based on how robustly their analytical signals can model users. This kind of personalization does not deliver on stated preferences, but instead works within the set of *possible* preferences that emerge from these services' surveillance of users—the longitudinal collection and analysis of data about what they read, for how long, and where they click or swipe next.

Making *these* possible preferences work as well as possible is especially important because they are derived from user behaviors on free sites—“people just haven't

proven they want to pay for news content” (News.me) or leave signals about *which* content they like enough to pay for.

Interpreting transparency. The goal of transparency—at least in some contexts—was raised frequently. Designers had a common desire to tell users why recommendations were being made, to make their news systems “transparent” (“the core word in here” [Scoopinion]) in a way that they see as counter to traditional news production.

For Storify, transparency means attribution, making sure that audiences are

clear about where things are coming from. Every source is attributed to the original person and you can click through and see who that person is ... I think that’s the most important thing ... people are not as dumb as some might like to think so they will judge for themselves.

Working with indexed stories instead of curated tweets, the Google News executive agrees:

One of the things I’ve always wanted to see is I should be able to click through the byline on any story and find out more information about that story, and ideally get a link to everything they’ve ever written as a journalist, right? I just go back to the hyper-transparency model.

This executive wants to give users this information because he sees connections among transparency, attribution, and expertise. “We’re starting to surface these authorship annotations to help you see who’s behind the news ... to show expertise, which we believe strongly in.” That is, Google News shows you information about authors when these attributions fit *its* model of news expertise; this is not unfettered transparency, but transparency that aligns with a particular model of journalistic quality.

Note, though, that transparency was about revealing information about news sources, not about the level of data gathering or the ranking and personalization systems these interstitial designers are creating. None of our participants said they planned to make their algorithms and technical architectures completely open, but a senior Emporia designer said they are trying to create “transparency in recommendations”:

We haven’t got the stats on this, but it means a lot more to know *why* something’s being recommended to you ... to say ah, yes, that makes sense—than what we currently: “we”re recommending you these stories because [there’s an] 87 percent chance you’ll like it ... Recommendation systems, are all about trust ... [If] you’re giving good recommendations, they’ll come back. If they think you’re giving rubbish recommendations, they’ll just stop using you.

Our participants talked about three kinds of transparency: tracing *where* information comes from (attributing Storify tweets); knowing *who* created information (following authors through metadata in Google News); and learning *how* recommendations were made (seeing some of how Emporia’s personalization system works).

Eschewing journalism. Finally, although all of our participants talked about themselves in relation to press practices and traditions, many of them also distanced themselves from journalism altogether, claiming little or no relationship to news work. “I don’t know if anyone is thinking about practical journalism and fair and balanced

storytelling,” confessed a senior News.me designer. When asked which journalistic ideals motivate designers working on these types of products, a senior AOL designer said:

I don’t think that the people in this space who are doing this are familiar with these ideas of journalism that you’re talking about, except in the most cursory way. And even there, I don’t think that they believe they’re important. I think essentially, zero. I think there are no ideals being pursued. (Editions)

His colleague agreed, saying

I feel guilty being the guy whose like “Success for me is when people read my thing.” You know, I’m building an entertainment product. I don’t even consider all the things that you guys are talking about. (Editions)

A Scoopinion co-founder, though, makes a distinction between not having journalistic intentions and not being able to embed news values within the algorithms they use to track user behavior:

No, sorry, [this is not] the way journalists think about the public interest ... information about the click-shares is not about the content itself. It’s about access to the content, and it doesn’t really tell how these pieces of news are read, so it doesn’t really even tell about the public interest. (Scoopinion)

He laments that the *materials* and *practices* they use in their product design are difficult to link with more nuanced understandings of what online news recommendations *should* be like.

The senior News.me designer suggests that the disconnect between app design and news values is due to professional cultures not intersecting:

I think it would help a lot for people to have newsroom experience, or advice; and there’s no shortage of it. There’s so many people that are in newsrooms now that would be able to sort of change the news business models. I think Flipboard is hiring editorial, I don’t know if any of the other people are, but I think it’s important why are they hiring. I think that’s what’s missing from a lot of the stuff now, is the whole journalism with storytelling and editorial side of things. It’s just all been about presentation. (News.me)

How They Are Like/Unlike Others

The second theme that emerged from listening to participants describe the institutional field of news was how they were like and unlike other competitors, as well as traditional news organisations. We can think of these descriptions as being a part of “boundary maintenance” (Coddington 2012), based on Gieryn’s (1983) concept of boundary work: the way a field describes itself as different to others, in order to create a social and professional boundary between it and adjacent fields. As Coddington explains:

These boundaries are often indistinct or moving, so they can become sites for ... “jurisdictional disputes” between neighboring professions. Within professional journalism, blogs and “tabloid” or entertainment news have been seen as neighboring professions, and this definitional rhetoric is commonly exercised by insiders through

public self-criticism, using dichotomous distinctions such as professional/amateur, responsible/irresponsible, and ethical/ unethical. (Coddington 2012, 380)

Four themes emerged in how participants understood themselves as like/unlike others: *heavy versus light infrastructure*; *curation versus aggregation*; *app designers versus mainstream media*; and *app designers versus gatekeepers*.

Heavy versus light infrastructure. Some participants described themselves as having a more open participatory framework than traditional news organisations, drawing on the inputs of countless non-professionals who will contribute content to their service. As one senior designer at Storify explained:

What would you do if you wanted to recreate the AP [Associated Press] today? You know, would you build the news service by getting a bunch of offices all around the world and hire people and translators and assistants and drivers and create all this infrastructure for sending the reporters everywhere, which the AP has done? It boasts that it's the world's largest news organization, right, because they have like 3000 reporters. Okay, but 3000 is nothing compared to, now, every person with a smart-phone, right? There's no way that AP can have somebody everywhere that something might happen. But now people are everywhere that, obviously, if people are there, they can report on it using their phones, using Twitter, using YouTube, Flickr, all these means at their disposal. So, I mean, that you now have potential to have an AP of everybody of the world, basically, but how do you deal with that? It's amazing that we've empowered all those people to easily broadcast information to the entire world, but it's overwhelming. So how do you solve that issue?

He concluded that the answer for him was "curation of social media; building a platform where we enable journalists, bloggers or whoever wants to really to find the best of social media and use human intelligence." Here we can see a boundary being defined between an expensive infrastructure of trained professionals and offices contrasted with the reach of drawing on anyone using mobile and social media. This is unpaid and untrained labor, but it is described as empowering, with the main challenge being the platform creation and maintenance. The cost and infrastructure of some media organisations are depicted as being onerous and unnecessary—a legacy of an earlier time—as a senior figure at Zite outlines:

What I think is going to save this is that there are lots of successful organizations. I mean Huffington Post got a Pulitzer Prize this year ... I was sitting on a panel a few weeks ago with a Mother Jones editor and she was talking about how expensive it was to make stories, and how you needed copy editors, and lawyers and all this stuff to fact check, and I'm like you can't use those arguments anymore about news organizations being too expensive because look at Huffington Post. They have created, in many ways, a network that's larger than some major networks out there, and done it on a budget that's a tenth of a traditional media budget. (Zite)

App designers versus mainstream media. Boundary maintenance has often been considered from the perspective of incumbent media describing different but related forms, such as blogs, leakers, and news aggregators, exemplified by Coddington's (2012) excellent study of how professional journalists talk about Wikileaks.

Similarly, news app designers mark their sector out as different, while also defending themselves against perceived criticism from mainstream media:

I was always kind of bemused by the debates early on about aggregation, particularly those who were saying ... there are a lot of news publishers who were being very critical of aggregation. And in some cases, it's fair enough. I have no more respect than anyone else for someone who's basically taking an undue amount of content and just republishing it, right? I mean we obviously follow very precise guidelines for what we feel is a fair use snippet. Not everyone does that. So on the one hand, I can look at some of those practices and easily say inappropriate leveraging of someone else's work. On the other hand, news reporting is largely derivative work, right? I mean there are pieces of additive facts and value, but so much of news coverage, understandably, is building on prior news coverage. (Google News)

Others described the relationship to mainstream media as something complex but worth fostering, designating them as more of a content partner, rather than a source for aggregation:

So we wanted to figure out a way for publishers like *The Times* to get what they want, which is money for their content, which is information about the people that are consuming their content. So how do we set something up where people can consume *New York Times* content, outside of their walls, in a place that they enjoy, but also have *The New York Times* benefit, and not lose anything from it? That's my goal in this as I try to create this sort of layer outside of publishers where people can consume content away from the publishers' sites or apps, but that they're not losing money and data. They can benefit from this ecosystem. (News.me)

Curation versus aggregation. The dividing line between curation and aggregation emerged frequently, as a contested ground where some designers spoke passionately about why they were not "mere aggregators" and instead curating a series of complex signals, from social media and from a user's reading patterns as expressed in metadata (time reading a story, what genres they clicked, what their friends were reading). These kinds of distinctions can be contextualized using Sewell's concept of *schemas*: conceptual frameworks that allow actors to recognize and classify norms of behavior and proceed in accordance with them (Sewell 1992). In Takhteyev's (2012) *Coding Places*, a study of software developers in Brazil, he argues that by paying attention to the "doings and sayings" (Schatzki 1996) of developers, attention can be given to the actors' use of schemas by which they understand their own products and also the social structure of software practice (Takhteyev 2012, 32). Furthermore, we can observe a "transposability" of schemas, defined as "the actors' ability to draw on schemas that were originally developed for use in a different context" (33). Some of the criticisms that were described as coming from news publishers towards news apps were being transposed into distinctions between types of news apps, between curation and aggregation:

You know, Google News in general we felt was a pretty bad experience in a sense that there's not a quality control to it. We wanted to give the user a good experience and it involves having a little bit more control over the content that you're going to render for them. Yahoo News, which we knew was the more popular news site on the Web, did things I liked. Yahoo did something to sort of protect the user experience, you know, you when you're looking at Yahoo News, you can expect first of all what sources are going to be represented there and that when you click on something it's actually

still Yahoo—it's still a Yahoo page, whereas like sometimes when you click on a Google News page, it takes you to some random website and there are pop-ups even though your pop-up blocker is on; and it's just a terrible experience. (Fluent News)

Other participants similarly sought to separate themselves from aggregation, often described as the basic RSS reader model:

A lot of people thought, "Okay, RSS is the future, RSS Reader." And it didn't really go anywhere. People still use it that way. And now you see these apps coming to iPhone and iPad, particularly Flipboard and Pulse. They're really just RSS aggregators. To this point, they're not really doing anything behind the scenes other than like a different presentation. But for the most part, it's all really content from some publisher, or stream sort of by time. No different than RSS, but they've innovated the presentation there, which I think is different. And people come into it like, "Oh, this beautiful. It's interesting, the layout is different. It's not Google Reader," which is awful, awful, awful. (News.me)

App designers versus gatekeepers. Finally, news app designers are working within a system where they do not have final control over the access to the app, and who can download it. This emerged as a point of tension for one participant—there are gatekeepers who are distant from the developers, who control the larger marketplace:

Yeah, well there's another piece that I think is really lost in this which is that probably the most important player in this is Apple as the gatekeeper. Like they're the gatekeeper of news now, right? For instance, I'm still upset with them, you know, they wouldn't let us into Newsstand even though our thing is the most episodic of all of them, okay, they wouldn't let us into Newsstand because we were aggregating content. (Sol, Editions)

While particular kinds of boundary maintenance were common, such as between traditional news organizations and start-up news app companies, and between aggregators and curators of news, it was rare to hear about the final arbiters of the app marketplace, such as Apple, Amazon, and Microsoft. In many ways, these structures lay outside the kinds of inherited schemas from mainstream publishing, with its contests between the penny press and the quality press, or newspapers and blogs. Instead, these gatekeepers were only mentioned by the participant who had run into difficulties with an app release. Otherwise, they disappeared as a kind of invisible infrastructure that could be relied upon, until such time as they could not.

Discussion and Conclusion

In our fieldwork, we saw how the artifacts and infrastructures produced by "interstitial designers" also serve as particular kinds of boundary objects, as app designers sought to both understand their work and mark it out as different to other actors in the news industry. We continually heard designers invoke and move among different kinds of traditions and ideologies. They talked about their impression of journalism as an information-focused practice and the need to give people individual, personalized views of the internet's surfeit of data. They described news readers primarily

as customers, aiming to create designs that would meet their demands and desires, judging success in terms of how large their audiences were.

Some designers eschewed journalism altogether, rejecting what they saw as the traditional press's outdated and complex infrastructures; instead, they aimed to create lightweight architectures that used crowd-sourced, participatory labor to do the work of news professionals. That is, instead of seeing simple divides between algorithms and editors, between curation and aggregation, between "old" or "new" journalism, we saw a complex mix of motivations and self-stated identities.

News app design seems to constitute an "organizational field": a "community of organizations that engage in common activities and are subject to similar reputational and regulatory pressures" (Powell et al. 2005, 1134). In moves that resemble organizational homophily dynamics (how field structures emerge as firms emulate each other and distinguish themselves), our interviewees invoke and reject the traditional press, differentiating and aligning themselves with other technology creators.

Although this is an early step in characterizing this hybrid space of journalism, entrepreneurialism and technology inhabited by news app designers, much of what they do certainly resembles the boundary work that Coddington (2012), Lewis (2012), and Star and Griesemer (1989) describe. But instead of coalescing around particular objects, events, or technologies, this kind of boundary work is distributed across multiple actors (including aggregated audiences), varied material objects, and technological practices. It seems closer to what Bowker and Star (1999, 313–314) sketch as "boundary *infrastructure*": "regimes and networks of boundary objects ... [that] allow for local variation together with consistent structure to allow for the full array of bureaucratic tools (forms, statistics, and so forth) to be applied." For example, when news app designers reframe Twitter traffic (as News.me and Storify do), cull search behavior (as the Google News executive described), or analyze social network shares (as the Scoopinion explained), they work from *common* materials and use consistent structures, but they employ and *deploy* self-designed, proprietary algorithms in particular, localized ways. These actors build and sustain boundary infrastructures because they can be read as members of an identifiable field (mobile, personalized news app designers)—but they also work in sufficiently diverse ways to appear different from their competitors and traditional, mainstream journalists.

It is amongst the social and technical details of the boundary infrastructures that interstitial designers are creating that we begin to see what we call the "liminal press": the field-level institutional relationships (among everyone from local newspaper beat reporters to Flipboard algorithm designers) that define the conditions under which networked news is produced, circulates, and has the potential to exert cultural power. While this liminal press is certainly related to mainstream, broadcast news organizations (that produce the majority of circulating news content), it is distinct in that it is embedded within logics of software design, algorithmic personalization, and dot-com entrepreneurship. The app designers we interviewed are working in a space *between* technology design and journalism, influenced by both but not entirely beholden to either as they create systems that gather, sort, rank, and circulate news.

The next stage of our research will include how these "sub-atomic particles"—the datasets and algorithms that define this computational, social news space—connect with the identities and positions described here. That is, given the *material* nature of how our interviewees talked about their work and its relationship to journalists and design

competitors, what is the relationship of datasets and algorithms within their ideologies of production? How do their *design* decisions and computational approaches—not only their self-reported identities—reveal boundary work? These determinations create the sub-atomic particles of this space—the data trafficking, algorithmic design, and techniques for personalization that structure this liminal space of news app design.

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