

# Content over Format: Modern Device Usage and a Realignment of the News Definition\*

Daniel Muise  
Stanford University  
Stanford, CA, USA

Jennifer Pan  
Stanford University  
Stanford, CA, USA

Byron Reeves  
Stanford University  
Stanford, CA, USA

## ABSTRACT

The way that political information is accessed on devices suggests that format-based ideas of ‘news’ are increasingly outdated and tied to bygone waves of media infrastructure. Thanks to smartphones, news-like topics are experienced and engaged with at any time, whether sought out or not, whether engaging or not, vetted or not, and true or not, all with the touch of a fingertip. Thus the concept of ‘news’ is increasingly able to revert closer to its original content-based essence as political information, organized in topics. To illustrate this point, we make use of a novel longitudinal screenshot-capture technique to study the user experience of news consumption over a whole day, and discuss the relevance of this development for the editorial process.

## KEYWORDS

News, screenshots, longitudinal, smartphones

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## 1 INTRO: FORMATTIC NEWS DEFINITIONS

Examples of news’ outdated format heuristics are relatable. Suppose a device-user is scrolling through the front page of a social media application when she lay eyes on a so-called ‘hard-news’ article written by a seasoned journalist. One second later, she sees an earnest post about a conspiracy theory from a distant relative. Then, at the same time, an involuntary Amber Alert message might appear at the top of her screen, while an email notification shows a monthly crime report from the neighborhood watch. Before she puts her phone down, her brother calls to tell her about his political views, her sister shares a link about an event happening in

the area, and then her friend texts her a link to a celebrity-gossip article. Which of these experiences are *news*? In five minutes, she has taken in a great deal of information about the world, but only one piece of content came in a traditional news-package, i.e. an article by a professional journalist. So what is news?

The growing mismatch in ‘news’ experience and the traditional ‘news’ format has inspired debates in both popular culture and academic circles: so-called filter bubbles and fake news are clear symptoms of confusion over what ‘counts’ as news. In the research literature, news has been variously defined, both implicitly and explicitly, by authors from multiple disciplines, ranging from computer science to communication theory. Papers that define news by its *function* focus on its informative value or functional utility. In this case, news and its demand are biological remnants of our interest in surveillance. Papers using this definition implicitly and explicitly convey that modern news is founded on newsworthiness, that is, actual utility for our well-being, but is flooded with stories painted with the biological signals of surveillance value: sensationalism, salaciousness, etc. Thus, news is whatever portrays itself as useful surveillance about the world outside [6, 20, 22, 24, 25, 29]. Papers that use an *industrial* definition imply that content is called ‘news’ if it was produced by a proper news-producer, e.g., the *New York Times* or *Fox News*. [3–5, 8–10, 16, 27, 30]. Other research articles combine these ideas. [12–14, 17–19, 26]

Certain research also makes use of *topical* cues when sub-setting content. This is more often true of quantitative or web-based papers which define news by focusing on articles *a)* produced by top media outlets and *b)* including certain keywords.[1–3, 7, 10, 23]. One final definition, *audience-based*, is implied through large-scale quantitative studies and computer science. The best example of an audience-driven definition is from Kwak et al. [15], which sought to determine if Twitter was a social network or a news outlet. They determined this by analyzing how information and messages were shared across ties. Under this concept, news is information that chiefly gets consumed without reciprocal information being sent to the source. Similar implications can be found in both Friggeri et al. [11] and Prior [21].

We take this academic divergence in news definitions and operationalizations to imply a separation between user experience and heuristic concepts of what news is, and this motivates a closer look at the exact experience of news consumption by individuals. We proceed by dissolving news into a lowest-common-denominator concept: *politically-relevant*,

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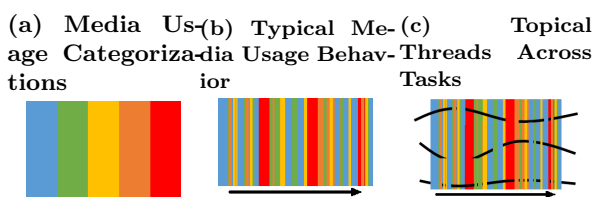
relatively novel information, and then illustrate and discuss the implications of this .

## 2 CONTENT-BASED NEWS CHARACTERIZATION & TOPICAL THREADS

Realigning our understanding of news starts with going back to basics: news is based upon the content, with formats and professionals being arbitrary artifacts of our infrastructural transitions through print, radio, and television. Applying this to modern life, a key takeaway is that a single topic can appear in various forms and through various channels, potentially being more ubiquitous *outside* of traditional news articles than *inside* such a format, but still being informative to a consumer. To explicate this point, we draw on recent research that describes so-called task-switching on electronic devices [28].

In a sample of undergraduates, Yeykelis et al. [28] found that individuals using laptops switched between applications once every 19 seconds on average, over the course of a day. This is illustrated abstractly in Figure 1, which draws on related work. Each color represents a type of task on a phone or laptop (e.g., *blue* is watching a movie, *yellow* is social media browsing, *red* is for reading traditional news articles). Firms and researchers tend to focus on these categories, and media users themselves may even think in these terms. However, the findings of Yeykelis et al. [28] suggest that we behave beyond the confines of these categories. In Figure 1b, we can conceive of time moving from left to right, illustrating behavior on a device over a day.

Figure 1: Media usage under typical task-switching.



We can benefit from considering topical ‘threads’ that appear and reappear through the media day, across various formats and applications, as illustrated in Figure 1c. Suppose a device user spends an hour flipping through applications multiple times per minute, switching between, say, the *Fox News* app, the *Facebook* app, Twitter, an email account, while carrying out a text conversation with a friend. He opened the *Fox News* app because his friend reminded him about an ongoing campaign story. The article he read referenced a candidate’s tweet, which lead him to open Twitter. What this hypothetical person experiences is clearly not just *app-app-app*, but a topical focus that drives behavior.

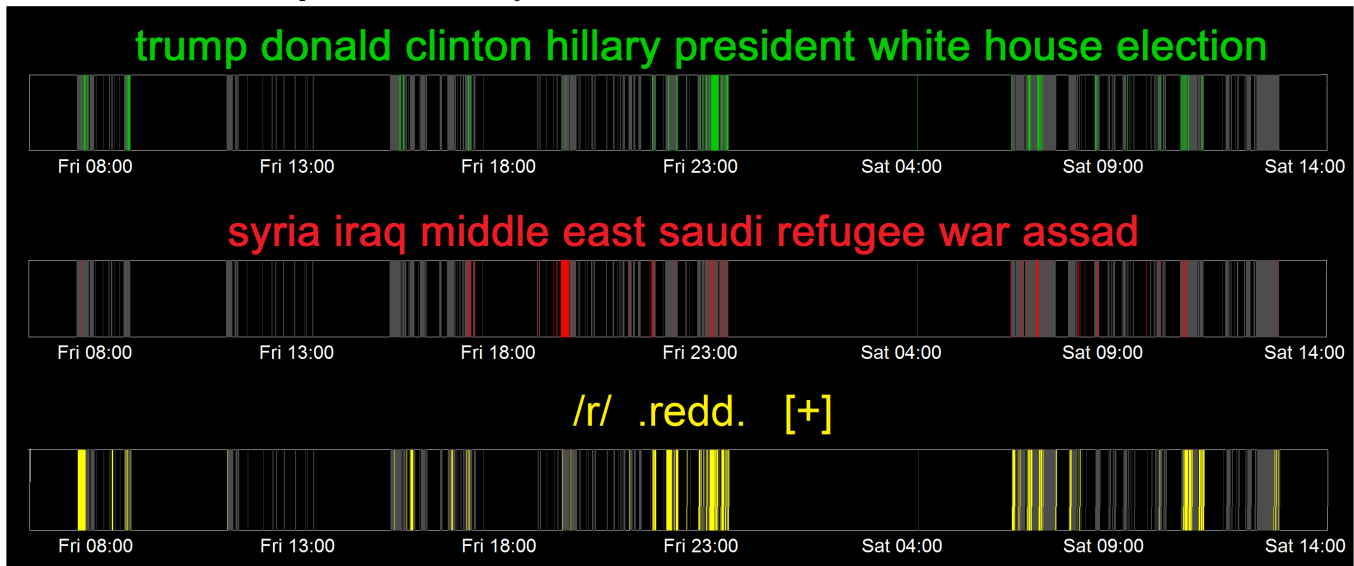
## 3 DATA AND ILLUSTRATION

We’ll now offer a basic illustration of a longitudinal analysis of a single person’s phone usage experience. Instead of tracking applications or web-browsers, screenshot-capture allows us to see what the user sees. The data comes from the Stanford CyberSocial group, from which the micro-level task-switching concept was brought forth [28]. The units of analysis are screenshots, which are exact reproductions of a phone or laptop screen at a given moment. Study participants installed an application on their phones and laptops which took a screenshot every five seconds; the images uploaded automatically to a server accessed by the researchers. Screenshots were only taken when devices were active. All screenshots have words extracted via a Tesseract-based optical character recognition system.

For this illustration, we focus on exactly 3700 screenshots, taken from 8:00am Friday April 14 until 2:00pm Saturday April 15, 2017, on the phone of an adult living in an urban environment in the Midwest. To be clear, this is not intended to be representative, merely illustrative, but we note that this subject and time-window were chosen at random from our pool of individuals prior to analysis. Suppose we’re interested in observing how, why, and when politically-relevant content arrives on a given device’s screen. The topic we choose is Donald Trump and the 2016 election. For simplicity, we operationalize this topic by searching for 7 keywords, listed at the top of Figure 2. The vertical lines in Figure 2 show phone activity in the time-window; every gray line represents a screenshot, and every green line represents a screenshot containing a keyword. For the same individual and the same time-window, we can also search for intuitive keywords of another political topic (the Syria crisis), plus keywords that suggest Reddit activity.

As visualized in Figure 2, Trump-related topics co-occur with Reddit-usage very often, implying first that Trump-related information mostly comes from Reddit for this individual (as verified by subsequent manual checks). Interestingly, this is not quite the same for topics related to the Syrian crisis, which appeared both within and outside of Reddit (including a hard-news article). Looking at Reddit usage alone, we can see that Reddit-suggestive keywords occur in leisure patterns (e.g., not during work hours), which has its own suggestive implications for how this individual interprets news about Trump (e.g., compared to Syrian-crisis-related keywords). Further manual checks on this data show that many encounters with political content occurred incidentally, i.e. by scrolling on Facebook or Reddit’s main feed, occasionally followed by traditional news consumption or viewing comment sections. In total, more than 5% of phone activity during this period contained at least one of these Trump-related keywords, but closer to 1% of phone activity was spent viewing what would be recognized as traditional news articles or videos. In any case, topical app-switching and task-switching was evident in this subject and many others, in line with apolitical findings in [28].

Figure 2: Keyword incidence over all screenshots. Time is the single axis left to right. Each vertical line indicates a screenshot being taken. Screenshots highlighted in color contained at least one topical keyword. The identical time windows allow visual comparison across 3 keyword sets.



## 4 IMPLICATIONS

While traditional news outlets and traditional news formats still dominate the news *industry* and set the international agenda, the *personal experience* of news consumption is moving deeper into a system dominated by rapid platform-switching and content-based media consumption sessions. This development is not at the level of the news outlet, of social media, or of any one firm, but is instead at the level of human-computer interaction. Convenience dictates news consumption unwedded to a single source or format, and not necessarily driven by intentional seeking—intentionality itself is obscured on algorithmically-personalized feeds. We must consider these human-level, device-level implications when seeking solutions for editorial systems, nearly all of which are still maintained by organizations or outlets that a device-user might pass through while following a topic. One logical (though unrealistic) conclusion for the realm of fact-checking would be device-level alerts that monitor topical trajectories across apps and websites and automatically alert users to concerns of so-called 'fake-news', much as can already be done on the article-level or outlet-level (albeit with mixed reviews). Regardless, as mobile devices dictate news consumption, how we determine what *news* is and how we address it editorially must be informed by the way the content, devices, and consumers interact.

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