

THESIS

NEWS NOW: EXPLORATORY STUDY OF DIGITAL NEWS STORY ORGANIZATION
AND STRUCTURE

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ABSTRACT

NEWS NOW: EXPLORATORY STUDY OF DIGITAL NEWS STORY ORGANIZATION AND STRUCTURE

Newspaper publication has expanded beyond the printed format to digital formats to attract readers using iPhone apps, Facebook, Twitter and other outlets. Some apps will open the full story and others link to the full story on the newspaper's website.

My exploratory research sought to explore different digital platforms by investigating *Washington Post* headlines written for the iPhone Application, Facebook, and Twitter. While these platforms limit the information available before linking to the full story on the website, each digital platform provided enough information to identify organizational patterns and sequences of who, what, where, why and how — the key concepts in the journalistic inverted pyramid writing organization.

My research investigated the *Washington Post*'s digital headlines in the summer of 2012. The research questions were RQ1: Which questions are answered most frequently in news story headlines on the iPhone app, Facebook newsfeed, and Twitter tweets? RQ2: What are the question sequences presented in the headlines on the iPhone app, Facebook newsfeed, and Twitter tweets? RQ2A: Is there a difference in organization of questions sequences in the headlines of story topics present in one of each of the following platforms: iPhone app, Facebook newsfeed, and Twitter tweets?

For my content analysis of the *Washington Post* digital headlines, I created a sample of a constructed week and took screenshots of headlines. For analysis, I coded all stories ($n = 216$) published on at least one other platform. I developed a codebook, and one additional coder and I

coded every headline in the sample. Despite some variables receiving lower Krippendorff Alpha results than suggested for publication for intercoder reliability (ranging from 0.33 to 0.83), most variables achieved acceptable percent agreements from 84.7% to 95.8%. Because of the exploratory nature of my study, I proceeded with data analysis.

Patterns emerged related to information sequences in headlines. “Who” and “what” were used in 77% ($n = 22$) as leading information in the headline sequences. “Where” was the only other variable included at the beginning of sequences. While 22 different organizational sequences emerged, 50% were used only once. Research Question 2A investigated organization of question sequences. The variable “what,” a main action, was included in 100% ($n = 27$) of the headlines in a portion of the sample using a single headline for each platform about one story. The sequence (who, what) was included in 22% ($n = 9$) across all three platforms. Other story topics provided additional variables on different platforms.

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This work spanned more time than I expected, and it became part of my life journey that included many valuable lessons. After experiencing some major losses in my family and learning the grieving process, experiencing a major career shift, and overcoming health issues, the completion of this research is a valuable achievement. However, a journey is not an experience in solitude, and I would not have reached success without amazing support systems in various parts of my life.

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INTRODUCTION

Journalism continues to evolve with technology. Despite perceived threats from radio and television, the written word continues to be the standard to disseminate information to the masses as more people access news from the internet. Dane (2003) posited that print culture could be as simple as the pairing of words. This print culture now exists on multiple digital platforms that branch out of one publication. Newspapers provide both print and digital editions. The expansion to include digital editions occurred quickly. Growing from 20 newspapers on the internet by 1993 (Gunter, 2003) to more than 1,300 online news sources three years later, newspapers were online including a mix of established news publications and new news groups (Gunter, 2003; Lasica, 1997). Now, newspapers have online software applications (apps) that allow readers to access news on mobile devices including smartphones and tablet computers. The software displays the story for readers without requiring a web browser to access the information from a website. Some digital media platforms may also link readers to the newspaper's story. Newspapers provide headlines that serve as summaries to entice readers to open the full story on the app or link to the article on the newspaper's website. These headlines, which served as different entry points to stories, through an iPhone app, Facebook newsfeed, and Twitter feeds provided the samples for this content analysis.

The changing print culture influenced circulation tracking. As of September 2010, circulation numbers from paidContent.org and data from Audit Bureau of Circulations included electronic edition data for paid online subscriptions (*The Wall Street Journal* was the only newspaper with paid subscriptions at the time); e-reader subscriptions including publications available on Kindles, iPads, Nooks and other electronic reader devices; and electronic replica

editions, which were completely reproduced newspapers online that were conducive to computer views (Edmonds, Guskin, & Rosenstiel, 2011).

News outlets have the option to specialize in a single form of output or multiple forms. The *Atlantic Highlands Herald* and the *Seattle Post-Intelligencer* are examples of web-only newspaper outlets. The *Huffington Post* is also a web-only news outlet, but it is a hybrid site that mixes blogs, online opinion pieces, and journalistic stories on its website. Rupert Murdoch's News Corporation tablet-native publication, *The Daily*, which launched in February 2011 was exclusively for the Apple iPad, exemplified the newest version of technological adaptation. Its website noted an expanded target audience of "tablets and emerging digital platforms" (2012) as the company expanded its audience to Verizon Samsung tablet users. *The Daily* ceased publication in December of 2012.

This digital spin on print culture gave way to new challenges for the written word that reaches people in a plethora of formats. In 2010, researchers began to explore technological advances and their potential effects on journalism and news consumption. *The State of the News Media: An Annual Report on American Journalism* by the Project for Excellence in Journalism and the Pew Internet & American Life Project (2010) reported that on a typical day, six in 10 Americans retrieved some kind of online news.

According to a January 2012 survey by the Pew Research Center's Project for Excellence in Journalism, 70% of computer (including desktops and laptops) owners use their device to obtain news; 51% of smartphone owners use them to obtain news; and 56% of tablet owners use them for news (Mitchell, Rosenstiel, & Christian, 2012). The study revealed that percentages of U.S. adult device owners are as follows: 77% own computers, which has been a stable number

since 2007; 44% own smartphones; and 18% own tablets. Most people who own multiple devices tend to spread news consumption across devices (Mitchell et al., 2012).

As of 2012, laptops were the primary device used to obtain digital news because they remained the device that had the most market penetration (Mitchell et al., 2012). Tablet devices were rapidly gaining market prominence. According to Pew Research Center's State of the News Media report (Pew, March 2011), the number of Americans owning an electronic tablet doubled within four months to reach 7% of Americans. According to the Pew Research Center's Project for Excellence in Journalism 2012 *State of the News Media* report U.S. adult ownership of tablets was at 18%, which reflected a 50% increase from the summer of 2011 (when it was at 11%) to January 2012 (Mitchell et al., 2012).

As of 2011, according to the *State of the News Media 2011* (Pew, 2011), the online news platform was the only one to grow, unlike local, network and cable television, newspapers, audio (including radio and web access), and magazines. The web, on the path to be the main news platform, also beat newspapers for the most used news outlet number two spot and only trailed television in the rankings for the first time. Digital media platforms remained number two behind television in the *State of the News Media 2016* (Lu, K. and Holcomb, J, 2016). The 2012 *State of the News Media* report expanded the survey data to explore news consumers' habits using multiple devices rather than simply comparing online to other traditional news outlets, such as television, newspapers, audio and magazines. Twenty-three percent of U.S. adults obtain news on at least two digital devices (Mitchell et al., 2012).

As news organizations began to use yet another platform for information dissemination, I identified the changing state of the industry to be a good time to investigate the contextual organization of the messages presented through the various media platforms published by a

single news organization. The results from the 2012 *State of the News Media* survey do not differentiate between news app and mobile website news consumption, but focuses on devices. Each type of device requires different coded output to allow readers to access stories. People who use computers have websites as access points to news, and people who use smartphones, and tablets have options for access points. Mobile devices support apps to provide access to news information; additionally users may access traditional websites from their device, or mobile websites if the news organization provides such a format of their traditional website.

Barnhurst (2010) replicated the Barhurst and Nerone 2001 study and compared newspapers to their respective websites focusing on replication of material (Barnhurst). The 2001 study suggested online articles were usually identical to print versions (Barnhurst and Nerone; Barnhurst), but data reported two-thirds of stories in both formats were identical or very similar while only one-sixth of the sampled stories had significant changes, such as more expansive coverage online compared to a listing in print (Barnhurst).

Multiple journalism textbooks warn of the dangers of shovelware, the concept of recycling the exact same text in print and digital versions (Grueskin, 2011; Gunter, 2003; Harrower, 2010; Ward, 2002; Wilkinson, Grant, & Fisher, 2009). While various textbook authors call for a different style of news writing for the web, none presented new organizational structures for online news stories. Authors (Bull, 2010; Harrower, 2010; Nielsen, 2000; Wilkinson et al., 2009) recommend specific advice when writing for online publication, including organizing information into distinct informational chunks, using bullet points, and keeping paragraphs short. Such approaches provide easier scanability for readers.

While these guidelines address the broad concept of online writing, research is needed to address specific guidelines for news writing. This research began with an investigation into

current practices to provide more insights into the industry in the midst of evolving standards related to technological advances and audience habits, expectations, and needs.

LITERATURE REVIEW

As technology continues to change and newspapers present information through multiple platforms, research is needed to investigate story organization from a theoretical perspective. Thus, this literature review explores cognitive processing, information processing, text presentation, and technological advances that impact newspapers and their information dissemination options.

Cognitive Processing

A fundamental component of the learning process begins with information processing and memory. People actively process information to make sense of it based on their memories and previous experiences and then organize information and integrate incoming information with stored information (Mayer, 2005). This process includes making sense of the information based on previously established memories and the new information that are stored in memory for future recall (Hawkins and Daly, 1988). People enact the memories when they decide how to respond to the information (Hawkins and Daly).

Memories are classified as being sensory, long term, or short term. Long-term memories are classified further as episodic and semantic memories. Overall, memories are foundational parts of schemas, which are defined as organized structures of knowledge that can influence personal perceptions. Individuals' minds simplify and organize complex concepts for later quick recall and influence on predictions, expectations, and early recognition (Hawkins and Daly, 1988).

Sensory memory is a brief store of information gathered by the eyes or ears, and that information is held as an exact visual image or exact auditory image before the brain processes

the information with conscious awareness in the working memory store of information (Mayer, 2005).

Working memory is the short-term memory the brain uses in situations for turning thought articulation into transmission actions such as speaking or writing (Hawkins and Daly, 1988). People plan ahead to speak and briefly store the information before they articulate the thought into a spoken format (Hawkins and Daly).

Long-term memory is stored information from previous experiences, which can later be recalled by a learner as a guide as they process information during working memory situations (Mayer, 2005). The amount of demands on the brain during cognitive processing can change depending on the form of information consumption (Mayer).

Semantic and episodic memories are stored memory. Semantic memory is not related to a time or place, while episodic memory is information related to specific indicators of time or place (Hawkins and Daly, 1988). Episodic memories can be translated into the more general, semantic format, which is an integral part of social or media interaction (Hawkins and Daly). People cope with the limited capacities of working memories in many ways. They focus differentially on text by paying the most attention to the most important information, or they organize information into conceptual categories that are hierarchically ranked (Glynn, Britton & Tillman, 1982).

Mayer (2005) posits current research in cognitive psychology assumes dual cognitive processing, which separates visual and auditory information. According to the dual channel assumption, Mayer explains that the cognitive processing of visual information primarily takes place in the visual/pictorial channel, while the processing of audio information primarily takes place in the auditory/verbal channel. The processing of printed text can include different

transfers between channels during processing. In all formats, Mayer posits, the process premise is that the initial information is presented to the senses and does not take much thought before the person picks up the information and temporarily holds it in sensory memory before the cognitive processing begins. The person pays attention to the information and selectively sets aside some information in a disorganized manner within working memory before organizing comprehensible mental structures (Mayer). At this point meaning is applied to the information that was previously represented by visual or audio representations (Mayer). The person might recall information stored in his or her long-term memory and cognitively integrate that information with the newly organized information (Mayer). The integration step takes place in the working memory (Mayer).

Text comprehension follows a similar process: word recognition, meaning retrieval, analyzing sentences, identifying essential ideas, organizing the ideas and finally, integrating the ideas with stored knowledge (Glynn et. al, 1982). Failure to successfully complete one or more steps in the process leads to comprehension breakdown on the micro level of missing specific text ideas or on the macro level of misunderstanding the general idea (Glynn et. al, 1982).

Strong story organization is important to enhance cognitive associations and overall comprehension (Yaros, 2011). Reading comprehension is positively correlated with a reader's ability to create contextual links within linear text (Yaros, 2011; Kintsch & van Dijk, 1978). Reading abilities and amounts of stored knowledge differ, which means organized text allows more advanced readers to skip material they have mastered. Research suggests that news stories rewritten to conform to chronological order improved readers' content memory (Lang, 1989).

Cognitive processing of story grammars.

People actively process information to make sense of it based on memories and previous experiences with similar information as they pay attention, organize information and integrate incoming information with stored information (Mayer, 2005). This process includes making sense of information based on previously established memories and new memories that are created and restored for future recall (Hawkins and Daly, 1988). As people make decisions about how to respond to information, they recall such stored memories (Hawkins and Daly, 1988).

Standardized story (in a generalized context and not specific to news stories) organization – i.e., story grammars — can influence comprehension. Accordingly, story grammars can be thought of as hierarchies with abstract story units at the top and details at the bottom (Berger, 1989). As people are repeatedly exposed to similar story structures, they begin to cultivate story grammars — i.e., schemata of mental representations of story organization (Berger).

People use schemas to comprehend text. This process invokes memories and decisions about which information to consume and in which order. Readers develop mental models of information and follow a pattern of slowing down to comprehend difficult or important information (Kozma, 1991). Common typographical cues — i.e., headings, abstracts and summaries — help readers decide whether to read a story (Kozma). As people read a story, they recall stored memories and decide whether or not they need more information about the topic based on their prior knowledge of a topic. People will move between parts of text as needed (Kozma, 1991).

One model of message processing, the Limited Capacity Model of Motivated Mediated Message Processing (LC4MP) focuses on three core subprocesses of information processing: encoding, storage, and retrieval (Lang, 2000). The model posits that the amount of processing

resources used contributes to the thoroughness of the information processing (Lang). Lang posits two principal reasons messages will not be comprehended. One reason is insufficient resources are allocated to processing the message (Lang). Second, the message might demand more resources than are available to process the message (Lang).

Lang (2006) suggests the LC4MP model and theory can be applied to all contents, media, and goals. If such applications are made, Lang suggests the medium, message content, and the message goal are the variables within the theory.

The LC4MP was developed to investigate the way people process television messages, but Lang (2000) provided suggestions for applying the model to messages presented in other media. Lang suggests researchers who apply the model to messages presented in other media ask the following questions:

- (a) What aspects of the structure of the communication situation or medium will engage the automatic resource allocation system?
- (b) What aspects of the content of the communication situation or medium will engage the automatic resource allocation system?
- (c) What demands does the medium or content place on cognitive load?
- (d) What aspects of the situation or medium will engage the controlled allocation processes?

The answers to these questions should allow researchers to predict variations in orienting behavior, resource allocation, recognition, cued recall, and free recall for messages being presented (p. 63).

Lang (2006) defined structures for television as video and audio including “luminance levels, cuts, slow motion, animation, zooms, pans, video graphics, frequency levels, sound

effects, music, rate of presentation, narrative structure” (p. 51). This explication of message structures refers to elements of visual and audio presentation that is separate from content structures or organization.

However, the use of the word “structure” for other media needs to be defined. In printed materials typographical features — i.e. headings, summaries, abstracts, bold type, italicized type, and transitional devices such as first, second, etc. for chronological — and formatting — i.e. paragraphs (indents or spaces between paragraphs) and bullet lists — are structures.

Two studies about stories applied the concept of structure to the concept of story organization of information (Sternadori & Wise, 2010; Wise, Bolls, Myers, & Sternadori, 2009).

Linear presentation of story grammars.

Information presented in print is arranged in a linear sequence. Content is presented as sentences and paragraphs in logical order from general to specific (Felker, Pickering, Charrow, Holland, & Redish, 1981). This sequence helps people read as they seek information. That said, people access textual material based on their knowledge needs and may not read text in a sequential order as they search for the specific information they need (Jonassen, 1982; Kozma, 1991).

Structural features give readers clues as to where to seek specific information within the entire body of text (Jonassen, 1982). Headings, presented typographically distinct from the body copy, are key cues to story organization. Headings guide readers topically through text. In addition to headings, concise summaries comprised of a few words are structural features that provide cues to key information in the greater body of text (Glynn et al., 1982; Spyridakis, 1989).

Headings help short-term text memory processing and help connect the new information to previously stored and organized information. Hartley and Jonassen (1982) define two heading functions that aid in learner acquisition of knowledge. First, headings help the reader encoding of information from text into memory by sparking memory, and help readers recall the overall organization and structure of the text (Hartley & Jonassen). Second, headings help readers by providing markers they can find on rereading passages when they later try to retrieve specific information (Hartley & Jonassen).

Published literature about the results of studies examining human response to different information structures establishes guidelines for organizing content. Structural clues in the publications can help readers comprehend content better (Williams & Butterfield, 1992). Informative headings within text demonstrate organization (Felker et al.). Question headlines help content retention, especially for poor readers (Spyridakis, 1989).

These concepts also apply to writing for websites. Nielsen (2000) suggests that effective writing for websites should include structure for scanability, such as two to three levels of headlines — i.e., from general headlines on a page down to more specific subheads and even more micro level subheads.

Story Organization

One of the more common story organizations in journalism is the inverted pyramid with deep roots in U.S. journalism (Wise et al., 2009). This structure begins with the most important information, as identified by the journalist, and ends with the least important details (Sternadori & Wise, 2010; Wise et al., 2009). The journalist identifies the important details of stories according to key questions: the 5 w's and 1 h (who, what, where, when, why, and how) about the story. The inverted pyramid, a recommended template for online writing, helps keep readers

moving quickly through the content (Bull, 2010; Nielsen, 1996; Wilkinson et al., 2009). This structure appears to have facilitated lost coherence because the organization relies on perceived importance (van Dijk, 1985, 1986; Yaros, 2011). Nielsen (2000) refers to the inverted pyramid organization as an organization that first presents the news story conclusion to provide readers with a preview of the content so they can choose what to read.

An alternative to standard inverted pyramid news story organization is personal storytelling, which integrates a personal experience into the story before expanding on its larger purpose of the news story. Research on personal storytelling is becoming more prominent in news writing.

Researchers have compared inverted pyramid news stories and news stories organized in chronological order, sometimes defined as a narrative story organization (Knobloch, Patzig & Mende, 2004; Lang, 1989; Sternadori & Wise, 2010; Wise et al., 2009; Yaros, 2006). In addition to the chronological version, Knobloch et al. also examined structure with omission organization that was organized to begin with the outcome followed by the narrative story's portions as follows: exposition, complication, climax, and initiating event.

According to different research about story organization, inverted pyramid organization is not as effective as other organizations, such as chronological organization, for information gain. Narrative story organization is more congruent with human perception of information about events and how people naturally communicate about events (Ferrell, 1985; Fisher, 1985). The organization of events sequenced chronologically is at the foundation of episodic human memory, which is the type of memory employed in recalling news story details (Chaffee, 1973; Tulving, 1972).

Further, research has shown that when linear news story construction strays from the traditional inverted pyramid organization, it increases both interest and content comprehension (Yaros, 2006). In one study, complex scientific stories were changed from their original inverted pyramid organization to an explanatory organization. Yaros (2006) found that the deeper reconstructed story significantly enhanced content interest and understanding. In a more recent study of digital stories, Yaros (2011) manipulated linear or non-linear links throughout stories. The results supported construction-integration theory in that the highest interest and understanding scores were positively correlated with linear story organization created with the linear links (Yaros, 2011).

In an experiment, Knobloch et al. (2004) set up an inverted pyramid organization to model the following precise organization: initiating event and outcome in the beginning followed by exposition, complication, and climax. This experiment applied the structural-affect theory to news to explore whether story organization influences suspense, curiosity, and reading enjoyment (Knobloch et al.). The results suggest the inverted pyramid was inferior to narrative organizations in regards to high levels of suspense, curiosity, and reading enjoyment. The results were similar for the stories presented, through design and layout cues, as novel excerpts or news articles (Knobloch et al.).

Recent research has emerged applying LC4MP to text processing (Wise et al. 2009; Sternadori & Wise, 2010). Two separate experiments compared the inverted pyramid organization to alternative narrative organization (Wise et al., 2009) and chronological organization (Sternadori & Wise, 2010). Wise et al. (2009) investigated multimedia consumption online by reviewing the impact of online story text writing style on successive cognitive processing of a video related to specific text. Results suggested inverted pyramid story

organization required more cognitive resources to encode and decreased story detail recognition accuracy (Wise et al.).

In another experiment, Sternadori & Wise (2010) investigated written news story organization effects on men and women in regards to cognition and the gender gap. They found that men created more meaning and/or had an easier experience processing chronologically organized stories, but women processed both chronological and inverted pyramid story organizations at similar rates as men (Sternadori & Wise, 2010). According to the LC4MP, the results from the experiment could also mean that men allocate fewer resources to chronological stories, which leaves them with more resources to complete the secondary task. Secondary tasks required, responding to auditory noises upon command (Sternadori & Wise).

Story output on different devices.

While the use of multiple languages for coding and screen output of information is one solution for the demand of publication of the same material for multiple screen sizes, responsive web design is an alternative concept. Responsive web design is built on the premise of using flexible layouts that are not restricted to exact dimensions in code (markup language). These designs use percentages to allow for flexibility of output without the need to create multiple pages for different devices (Marcotte, 2011). While convenient, Marcotte acknowledges the argument against a flexible design, which addresses the concept that mobile device users have different priorities for accessing websites than desktop users, and one HTML document does not consider such differences. Marcotte defends his flexible design by positing that it is difficult to define whether or not those differences exist because some people use mobile devices at home for extensive browsing and not just on the fly when they are out and about. A similar issue exists in journalism as news outlets disseminate information to multiple devices. They can implement

shovelware and flexible, responsive web design to use the same content or generate new content for specific platforms.

An informal interview with a metropolitan newspaper’s social media editor suggested a majority of newspapers were still using shovelware for news story content on their websites and apps (D. Petty, personal communication, February 1, 2012). However, the editor reported that new content is written specifically for social networking promotions, such as newsfeeds on Facebook and tweets on Twitter (D. Petty, personal communication, February 1, 2012). The newspaper used the social networks to attract readers to stories posted on the newspaper’s website.

My study investigated the organizational patterns of the content written for the iPhone app and what should be rewritten content about the same topic for presentation on Facebook and Twitter. Initially, I observed each medium for the study to determine different types of information. Each structure is a component to a single story package that ranges from robust information (headline, summary, photo and embedded link) or a basic level of information — a text summary and external link.

Table 1

Information available on each medium

iPhone App	Facebook	Twitter
Text <ul style="list-style-type: none"> • Headline • Beginning of story 	Text <ul style="list-style-type: none"> • Headline 	Text <ul style="list-style-type: none"> • Headline
Photos*	Photos	
Embedded link to full story on app	Overt link to full story on newspaper’s website	Overt link to full story on newspaper’s website
	Business Profile Link	Business Profile Link
	Profile Photo	Profile Photo
	• Company Logo	• Company Logo

Note. * = not all stories on the iPhone app include this element.

Variables

This research project investigates the news story delivery by the *Washington Post's* website news posts on the newspaper's iPhone app, Facebook, and Twitter, and then reviews the story sequence organization of the digital news story headlines on each of the three platforms. To investigate the headlines and sequences, the variables are the concepts who, what, where, why, and how as defined below and needed to be overtly stated to be counted:

(a) "Who" is the agent (subject) of the headline and can include people, organizations, objects, or ideas.

(b) "What" is the main concept of the headline and represents the action. This concept defines the purpose of the headline and provides information about the concept that happened. If this concept is present, it will answer the question "what happened" or is currently happening.

(c) "Where" is the location of the "what" in the headline. A specific physical location must be overtly included in the header to be counted as answering where the main concept is occurring.

(d) "Why" is the cause of the action in the headline. This is the reason behind the "what" in the headline.

(e) "How" provides more specific details about the "what" in the headline and provides details about the way "what" happened.

Digital news platforms are additional media a newspaper can use to disseminate information in addition to the print edition, if a newspaper still provides a printed version. Readers can access apps using compatible mobile devices such as a tablet or smartphone, and they can access Twitter and Facebook content through computers, tablets, or smartphones using

the social media websites or their respective apps. The news apps are formats used to present news stories on that specific software on mobile devices. Twitter and Facebook allow the newspaper to have its own profile where it can post information and include links that take readers away from the social media platform and to specific stories on the news website or wherever the links are intended to take the reader. In some cases, the links may direct readers to different places than the news website. There are not parameters from the social media sites that restrict the newspaper from sharing informational links that are not its main website. This information on the social media profiles is available to people who connect to the profile and receive the links (to specific news stories on the newspaper's main website) through newsfeeds, or for people who visit the profile page and have access to the links posted on the profiles.

“Digital news stories” require new definitions as technology continues to change. Li (1998, p. 353) defined an internet newspaper “as a publication available on the World Wide Web, a colorful platform provided by navigation software.” For this study, digital news stories will be news stories that are published through the newspaper's digital platforms with viewing capabilities on any device.

News stories have various forms of summaries of their content. Headlines, subheads, and story summaries are examples of the different forms of summaries that serve as story previews.

Headings, also called headlines, are concise summaries comprised of a few words that provide prevalent themes from the greater body of text (Felker et al., 1982; Glynn et. al, 1982). Informative headings and subheadings allow readers to quickly and easily find information in the text because they should give an overview of the content that immediately follows (Felker et al.). For this study, headings will also include the characteristic of being typographical spatial

markers (Hartley & Jonassen, 1982) that preview the news story on the newspaper's website and are set apart typographically and spatially by appearing in bold face format.

Wilkinson et al. (2009), in a journalism textbook about convergent journalism, suggest writers include summary paragraphs at the beginning of stories on websites to increase scanability and to produce concise effective messages for mobile devices. Wilkinson et al. suggest effective summaries can provide headline information and story context in fewer than 130 characters. This number of characters was established according to short message system (SMS) messages, such as text messaging on mobile phones. Twitter only allowed posts to be 140 characters at the time of data collection.

As discussed in this literature review, previous research on news story content organization includes harsh criticism for the inverted pyramid and its inferiority of effectiveness compared to narrative organization.

To date little published research has explained the effects of news story delivery on headlines, news story summaries, and news story organization on apps, Facebook, and Twitter. Therefore, my exploratory research investigated current practices related to digital news story information and sequential organization in the *Washington Post's* headlines at the time of data collection, the summer of 2012. I established the following general research questions:

RQ1: Which questions are answered most frequently in news story headlines on the iPhone app, Facebook newsfeed, and Twitter tweets?

RQ2: What are the question sequences presented in the headlines on the iPhone app, Facebook newsfeed, and Twitter tweets?

RQ2A: Is there a difference in organization of questions sequences in the headlines of story topics present in one of each of the following platforms: iPhone app, Facebook newsfeed, and Twitter tweets?

METHODOLOGY

I conducted a content analysis of the *Washington Post*. Specifically, I will discuss the research setting, constructing a sample week, the random sampling process, coding and inter-coder reliability, and conclude with data analysis. I followed standard content analysis procedures practiced within social and communication sciences research (Babbie, 2004; Krippendorff, 2004; Neuendorf, 2002).

Research Setting — Selection of Newspaper.

As an exploratory content analysis of one newspaper, I investigated stories posted on the *Washington Post*'s iPhone App and corresponding stories posted on the newspaper's Facebook account newsfeed and Twitter account tweets between July 17 and August 17, 2012.

The *Washington Post* is a progressive newsroom that at the time of data collection had dedicated staff for new media platforms. According to its website (2012), the newspaper had expanded its services in news dissemination to include a website that allows access through personal computers and other devices and mobile platforms capable of internet connections. The mobile platforms listed on the *Washington Post*'s website (2012) — iPad apps, smartphones, Twitter, and Facebook — are all examples of how the newspaper expanded its reach through different platforms.

I selected the *Washington Post* for three reasons. First, the *Washington Post*, a progressive newspaper, transformed how it disseminates news. According to its website in May 2012 and throughout data collection period between July 17 and August 17, 2012, the *Washington Post* offered iPad apps, a mobile website for mobile devices, smartphone apps for iPhones and Android phones, an RSS feed, Facebook feeds, Twitter feeds, and a Social Reader

app. Second, during my informal interview with the social media editor at the *Denver Post*, the editor said the *Washington Post* was one of a select few newspapers in the United States that devoting more attention to the web than simple shovelware for multiple platforms (D. Petty, personal communication, February 1, 2012). Third, the *Washington Post* was selected based on data from Scarborough Research and the Audit Bureau of Circulations, which started a new form of assessing circulation by expanding numbers to include online readership. Scarborough Research measures only local markets to examine newspapers' comprehensive reach, including print and online readership (Edmonds, Rosenstiel & Mitchell, 2012). Totals measured by Audit Bureau of Circulations and Scarborough included numbers that counted a reader if he or she reads the print edition or visits the online edition at least once per week (Edmonds, et al., 2012).

Based only on its local readership and excluding national and international audiences, the *Washington Post* was ranked 6 of 25 nationally, according to this new form of measure (Edmonds, et al., 2012). This ranking number does not include iPhone and iPad apps for readership.

Creating a Constructed Week.

Creating a constructed week for sampling stories is a common method for analyzing the cyclical variation of news stories representing all seven days of the calendar week (Luke, Caburnay & Cohen, 2011; Jones & Carter, 1959; Stempel III, 1952; Riffe, Aust & Lacy, 1993). I created a constructed week by random sampling of five weekdays, one Sunday, and one Saturday between July 12, 2012 through August 17, 2012.

To select one date for each day of the constructed week, I followed the random sampling procedure recommended by Babbie, (2004) and used Babbie's (2004) Random Number Appendix (page A18). Random selection was achieved by choosing a random start point for each

day through the Babbie’s Random Numbers Appendix. For example, for Sunday, I blindly (closed my eyes) and pointed to a random number with a pencil to choose a starting point in the Random Numbers Appendix. I then looked at the two numbers furthest to the left seeking the first match of one of the dates in the Sunday column (Table 2). The first Sunday date to appear was 29. Which allowed me to select Sunday, July 29 to represent Sunday for the constructed week. I followed a similar procedure to create my constructed week for the remaining days. The resulting constructed week was Sunday, July 29; Monday, August 6; Tuesday, July 17; Wednesday, August 8; Thursday, August 2; Friday, July 20; Saturday, August 4.

Table 2

Dates for respective days of the week during data collection period

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	01	02	03	04
05	06	07	08	09	10	11

My original Friday, July 20, was interrupted when I went to Aurora to work as a stringer for news coverage of the Aurora movie theater shooting. I picked a new Friday following the same procedure and extended collection to August 17, 2012.

Selecting Headlines for Analysis.

I used data from a content analysis of the Top Stories respective headlines on the *Washington Post*’s iPhone app, Facebook newsfeed, and Twitter Tweets collected between 8 a.m. and 11 p.m. (EDT) of each sampled day. The Top Stories were identified by the list featured on the newspaper’s iPhone app, which clearly listed top stories that I confirmed were also listed prominently on the publication’s website.

Creating a database of headlines posted on respective media.

A dynamic and quickly evolving situation of regular news updates throughout the day in addition to rapidly changing technology posed a threat that the sample could include incongruences if the period of data collection is too long. Therefore, I gathered information from a sample week made up of a random sample of each day of the week within one month.

I determined the sample size by how many stories were posted in the iPhone app Top Stories section each sampled day and whether the stories also appeared either on Facebook or Twitter or on all three platforms. I first took screenshots of the Top Stories section at 8 a.m. EDT each day and checked for any new stories throughout the day at the top of every hour until 11 p.m. EDT. The times for data collection were established based on an East Coast publication. The morning time was determined as the beginning of the newspaper's typical business day, while still allowing for reasonable flexibility for the researcher who collected data two hours behind EDT. A review of Facebook posts with story links revealed that the *Washington Post* did not post anything after 10 p.m. However, posts began to show up on the newsfeed shortly after midnight.

The Top Stories (see Figure 1) section was identified through the newspaper's app. The stories listed on the app usually corresponded with the leading stories displayed on the website. However, the website does not have a section title to clearly identify the stories as being part of a section, but rather they are displayed prominently with little to no scrolling required to find them on the newspaper's homepage.

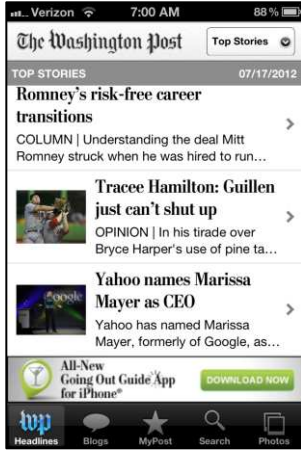


Figure 1

Screenshot of Washington Post's iPhone App

At the time of data collection (July 17 through August 17, 2012), the *Washington Post* offered content on its website, Facebook account, and Twitter account, all of which were accessible by laptop (or desktop) personal computers, smartphones, and tablets. I gathered data using a desktop personal computer to view the content from Facebook and Twitter in a format that is larger than the downsized versions on mobile devices to allow for better views of content in the screenshots that were eventually printed for coding.

Data Collection.

I captured all stories as screenshots at a specific point in time, at the top of each hour within the news business day, following Gunter's (2003) suggestion. The screenshots (screen pictures) were saved for coding and printed to ensure all stories were the same for analysis. I gathered screenshots from each technology platform at the same time every day throughout the constructed week sample for the study in case time of day affected headlines and overall content because of the dynamic environment of digital news. Time of day is not an issue with printed content analyses, but I wanted to ensure consistency with my data collection and considered that some headlines may change throughout the day, thus providing additional content to code. The

screenshot collection order was (1) iPhone app, (2) *Washington Post* website, (3) Facebook page, (4) and Twitter page. Most screenshots were obtained within the first five minutes of every hour during data collection.

Taking screenshots.

Screenshots of the iPhone app were captured by opening the *Washington Post* app, refreshing the screen by dragging the top of the screen with the top stories and then actually getting a photo of the screen by simultaneously pressing the home button on the front of the iPhone and the power button on the top of the phone. Then, I scrolled to make sure a photo of each story listed was captured. Sometimes the second to last photo and last photo in a set would include two duplicate stories. The screenshots of the app saved to the phone and were transferred to the computer. Screenshots of the webpages were created by opening one page to fill the iMac screen and simultaneously pressing <shift> <command> <3> to capture a picture of the screen. The photos were saved to the desktop and the researcher then filed the photos each hour.

The procedure produced 359 screen shots of the iPhone app, which was the source of stories for analysis.

Data Organization Procedure.

For identifying and coding, each screenshot page includes codes to identify day and times. Specifically, the first number indicates day of the week starting with 1 for Sunday and ending with 7 for Saturday, the second number indicates time, and the letter indicates time of day. For example, 1_6_a indicates Sunday 6 a.m. screenshots as illustrated in Figure 2.

Dates and times of Facebook and Twitter screenshots are included in the screenshot and did not require additional coding information. However, I added the coding for these formats to provide consistency and to minimize confusion and errors with coding. After further evaluation,

I decided to cut the story out of the screen format and placed multiple stories to be coded on a single page rather than forcing the coders to search for the stories to be coded. This also saves paper in the process.

I organized stories according to their platform to minimize confusion with different design elements for story header presentation.









<p>1_6_a_A 1</p>  <p>As presidential campaign heads into final 100 day... ></p> <p>Interviews with dozens of voters in Florida, Missouri,...</p>	<p>1_12_p_A 10</p>  <p>World champion gymnast Jordyn Wieber fails to qualify in all-around ></p> <p>12:04 PM ET The Americans' qualifying dominance was hardly unexpected, but Jor...</p>	<p>2_6_a_A 19</p>  <p>Syrian PM defects to Jordan ></p> <p>06:47 AM ET Departure further erodes President Bashar al-A...</p>
<p>1_6_a_A 2</p> <p>Sally Jenkins: OPINION What Phelps has left to give ></p> <p>OPINION Loss in 400 IM shows a diminished Michael Phelps still boosting th...</p>	<p>1_12_p_A 11</p> <p>Cheney says picking Palin for V.P. was 'a mistake' ></p> <p>01:38 PM ET Former vice president Dick Cheney said in an interview airing today th...</p>	<p>2_6_a_A 20</p> <p>Affiliate of firm with ties to Iran paid Obama associate to give talks ></p> <p>Before he joined the administration, White House adviser David Plouffe accepted a \$1...</p>
<p>1_6_a_A 3</p>  <p>U.S. cautions Syrian rebels not to repeat mis... ></p> <p>U.S. warning Syrian rebels against sectarian reprisals if...</p>	<p>1_1_p_A 12</p> <p>Hong Kong protest assails Communist Party 'brainwashing' ></p> <p>Tens of thousands of protesters parade through Hong Kong, calling for the scrappi...</p>	<p>2_6_a_A 21</p> <p>Britain exults in Olympic gold rush ></p> <p>The opening days of the London Games brought a period of national self-flagellation. But in a story of perseverance, redemption...</p>
<p>1_6_a_A 4</p> <p>Adviser: Romney would back Israeli strike on Iran ></p> <p>06:45 AM ET JERUSALEM — A senior adviser says Mitt Romney would back an...</p>	<p>1_2_p_A 13</p> <p>US swimmer Dana Vollmer sets world record in 100 fly; Lu takes sil... ></p> <p>02:16 PM ET LONDON — Dana Vollmer of the United States set a world record to win...</p>	<p>2_6_a_A 22</p> <p>Battles over state voting laws head to court ></p> <p>In the swing state of Ohio, some groups are challenging a rule that says provisional ball...</p>
<p>1_6_a_A 5</p> <p>Mike Wise: All hail Kobe the statesman ></p> <p>OPINION At 33, aging NBA star Kobe Bryant realizes this is his last Olympics —...</p>	<p>1_2_p_A 14</p>  <p>Is Rocketship ready for takeoff? ></p> <p>02:27 PM ET San Jose-based charter school group prepare...</p>	<p>2_6_a_A 23</p> <p>In a cold place, warming is most evident ></p> <p>The effects of climate change — including permafrost melt, more powerful storms an...</p>
<p>1_6_a_A 6</p>  <p>In Fairfax, a day-care conundrum ></p> <p>Without county intervention, a seemingly small administrativ...</p>	<p>1_6_p_A 15</p>  <p>Nationals rally past Brewers ></p> <p>Michael Morse crushes a game-tying, two-run home ru...</p>	<p>2_6_a_A 24</p> <p>In Iraq, scenes of hope and fear ></p> <p>A surprising amount of optimism, but fear at the obstacles ahead as Iraqis stand on their own.</p>
<p>1_6_a_A 7</p> <p>FTA told to beef up its oversight of Silver Line project ></p> <p>Federal audit urges tighter focus on costs, safety and scheduling of Dulles rail project.</p>	<p>1_7_p_A 16</p>  <p>Michelle Obama's designer jacket: Fit for a... ></p> <p>07:01 PM ET First lady wears \$6,800 jacket to Buckingham...</p>	<p>2_7_a_A 25</p> <p>Shooter at Sikh temple was military veteran ></p> <p>07:30 AM ET The man who allegedly shot and killed six people inside a Sikh temple...</p>
<p>1_11_a_A 8</p> <p>US wins in basketball on wet day at the Summer Olympics ></p> <p>11:07 AM ET LONDON — With all the rain at the London Olympics on Sunday, it was ju...</p>	<p>1_8_p_A 17</p> <p>France rallies past U.S. in relay ></p> <p>Lochte unable to hold lead for Americans during last leg of 4x100 freestyle, U.S. settles for silver.</p>	<p>2_8_a_A 26</p> <p>Best Buy founder offers to buy the company for \$24 to \$26 per share... ></p> <p>08:49 AM ET Best Buy's founder says he wants to take the electronics retailer privat...</p>
<p>1_12_p_A 9</p> <p>Romney in Israel: 'Any and all measures' should be used on Iran ></p> <p>12:50 PM ET Speaking in Jerusalem, Romney said the U.S. would support Israel...</p>	<p>1_8_p_A 18</p> <p>Chris Cillizza: No change of pace in the presidential race ></p> <p>As the Obama and Romney campaigns make the turn into the home stretch, not much is...</p>	<p>2_10_a_A 27</p> <p>Sikh temple shooter was Army veteran ></p> <p>10:47 AM ET Police say Wade Michael Page, who killed six people at a Sikh temple in Wl...</p>

Figure 2

Example of iPhone App Stories formatted for coding














<p>1_11_a_F 98</p> <p> Washington Post 6 minutes ago</p> <p>LeBron and Kobe for Team USA... how did men's basketball fare in the opening game? (Spoilers ahead) http://wapo.st/QVHrdo</p>	<p>3_7_a_F 105</p> <p> Washington Post shared a link. about an hour ago</p> <p>Fighting is intensifying around Syria's capital, Damascus, with the most severe fighting the capital has seen in the 16-month-old Syrian uprising. http://wapo.st/NRBA61</p>
<p>1_2_p_F 99</p> <p> Washington Post about an hour ago</p> <p>Huge women's gymnastics upset today in London (spoilers ahead): http://wapo.st/MsS8ip</p>	<p>3_8_a_F 106</p> <p> Washington Post about an hour ago</p> <p>Michelle Obama didn't expect it. The Kiss Cam. Boos erupted after the first lady playfully rebuffed the president's advances during the US-Brazil game last night at the Verizon Center (below), but the Obamas got a few cheers with a public smooch later.</p> <p>Images (corrected link): http://wapo.st/Q0XLsM Story: http://wapo.st/Q0FMCN</p>
<p>1_7_p_F 100</p> <p> Washington Post 13 minutes ago</p> <p>Michelle Obama's \$6,800 designer jacket: Fit for a queen? http://wapo.st/MVoWBy</p>	<p>3_9_a_F 107</p> <p> Washington Post shared a link. 16 minutes ago</p> <p>His writings were often provocative but seldom predictable. http://wapo.st/NvllwC</p>
<p>2_6_a_F 101</p> <p> Washington Post shared a link. a few seconds ago</p> <p>BREAKING: Riyadh al-Hijab is the most senior official yet to quit the embattled government, further eroding Assad's power base. http://wapo.st/QELJH3</p>	<p>3_4_p_F 108</p> <p> Washington Post 4 minutes ago</p> <p>POST REVIEW: The new Batman movie, "The Dark Knight Rises," delivers the impossible, says reviewer Ann Hornaday. It brings "a cherished cinematic chapter to a close, yet manages to leave fans feeling, not desolate, but cheered."</p> <p>Full review: http://wapo.st/ObvxsP PHOTOS: Who's who in "The Dark Night": http://wapo.st/NSpae6</p>
<p>2_10_a_F 102</p> <p> Washington Post shared a link. 3 hours ago</p> <p>The gunman who killed six people at a Sikh temple in Wisconsin has been identified as a 40-year-old Army veteran and former leader of a white supremacist metal band. http://wapo.st/NXjamE</p>	<p>3_7_p_F 109</p> <p> Washington Post 6 minutes ago</p> <p>"Ten days to the Games — what could go wrong?" a British newspaper headline asked today. The answer, as this Olympic host nation has discovered, is: Quite a lot. http://wapo.st/ND53Sj</p>
<p>2_3_p_F 103</p> <p> Washington Post 31 minutes ago</p> <p>The Keystone XL pipeline may threaten the massive Ogallala Aquifer, which provides water to farms in eight states, accounting for a quarter of the nation's cropland, as well as municipal drinking wells. http://wapo.st/MajKzj</p>	<p>4_7_a_F 110</p> <p> Washington Post 49 minutes ago</p> <p>Once regarded by Syrian rebels as a natural ally, the U.S. is increasingly being viewed with resentment, which could have profound consequences for the future of the country in a post-Assad era. http://wapo.st/Mxnqcl</p>
<p>2_4_p_F 104</p> <p> Washington Post 46 minutes ago</p> <p>BREAKING NEWS: The U.S. women's soccer advances to the final and is guaranteed at least a silver medal after beating Canada 4-3 in double overtime. The victory came on a header by Alex Morgan, below left, in stoppage time.</p> <p>The story: http://wapo.st/Nxq38I</p>	

Figure 3

Example of Facebook stories formatted for coding

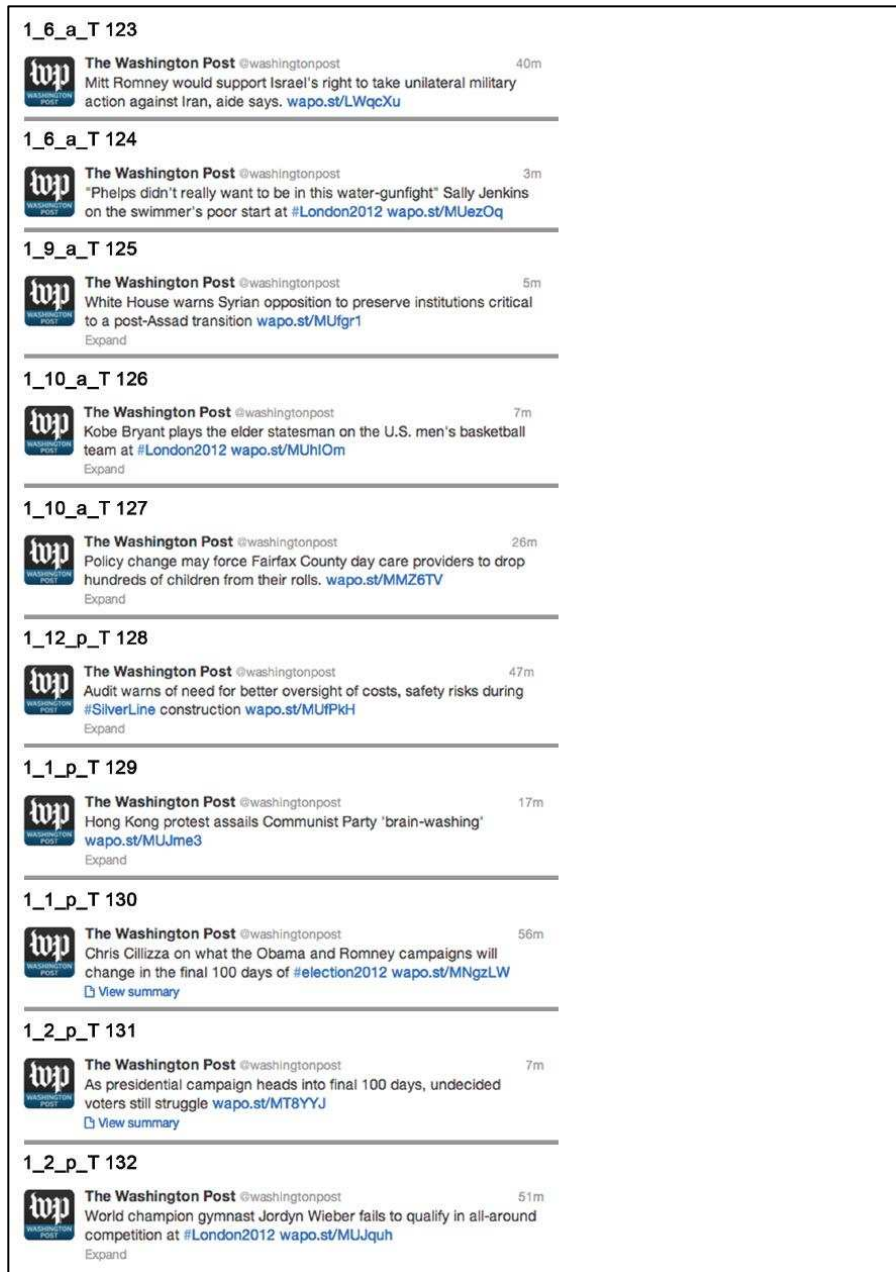


Figure 4

Example of Twitter stories formatted for coding

Pilot Story Samples.

To select stories for analysis, I followed the random sampling procedure recommended by Babbie (2004) and used Babbie's (2004) Random Number Appendix (page A18). Random selection was achieved by assigning a number to each story from 001 to 359 and choosing a

random start point for the first element through the Babbie's Random Numbers Appendix (2004). I blindly (closed my eyes) and pointed to a random number with a pencil to choose a starting point in the Random Numbers Appendix. I then looked at the three numbers furthest to the left seeking the first match of one number between 001 and 359.

I then followed systematic sampling. I began with a sampling ratio of 0.05 of the population, which is 18. Based on my population size and sample size, I determined a sampling interval of 20. This number was determined following the formula of population size/sample size (Babbie, 2004).

From the pilot sample of 18 stories, only one story was present across all three platforms (iPhone app, Facebook and Twitter). One Facebook story corresponded with iPhone app stories, and 10 Tweets corresponded with iPhone app stories. All three platforms (app, Facebook, and Twitter) included links that pointed readers to the main website.

After discovering the small number of stories that were published on all three platforms, I decided to analyze all of the stories that appeared on all three platforms. After I entered all the stories in one table, I found that 12 stories were present across all three platforms, and of those 12, nine were present with one headline in each platform (iPhone app, Facebook, and Twitter). The additional three included additional Twitter headlines for the story. I coded all stories that had crossover with at least one other platform for a total of 216 headlines for analysis. Of those headlines, I coded 97 presented on the iPhone app, 25 presented on Facebook, and 94 presented on Twitter. The iPhone app stories represented the number of different stories the 216 headlines referenced.

Table 3

Crossover of headlines across platforms

	Facebook Only	Twitter Only	Both Facebook and Twitter
iPhone App	13	72	12

Coding Scheme and Codebook.

A strong coding scheme documented in a codebook represents operationalization of variables for content analysis research (Neuendorf, 2002). For each variable, the codebook identifies the unit of analysis and explains the units of observations. Data for this study was measured at the nominal level for presence and the nominal level for sequences.

In my case, the unit of analysis is the *Washington Post* and the units of observation are headlines posted in the Top Stories section of the *Washington Post*'s iPhone app, Facebook headlines, and Twitter tweets.

The variables to be analyzed include the questions answered in the news story headlines and the organizational patterns of words presented through news story headlines. I did not examine meanings of the words or any latent content analysis (Babbie, 2004; Thayer, Evans, McBride, Queen, & Spyridakis, 2007). Each coder used one code sheet for every headline.

Each operationalized category-level variables included exhaustive and mutually exclusivity with the appropriate level of measurement (Neuendorf, 2002). This practice helps reduce confusion during coding (Neuendorf, 2002). My detailed codebook reduced systematic disagreements in coding, and I edited it multiple times until I achieved clear operationalization of variables. These kinds of systematic disagreements usually exhibit some kind of regularity and often patterns (Krippendorff, 2008). Identification of such disagreements can help narrow down why a problem occurred, such as various interpretations of the coding scheme. Systematic

disagreements can lead to Type I errors, which are exemplified when researchers incorrectly reject the null hypothesis (Krippendorff). Measuring intercoder reliability and agreement among coders establishes reliability of the data, but a separate measure of systematic disagreement will uncover possible Type I errors and distinguish if variance is related to the coders' understanding of the coding task or if he or she is systematically prejudiced (Krippendorff). Most of my edits to the codebook were a result of discussions following a subsample pilot study that revealed some disagreements in coding.

I established a coding scheme to identify presence and absence of answers to the variables who, what, where, why, and how. An additional table in the code sheet includes spaces to code for the sequence of the answers to each of the questions within headers, which will allow me to analyze any differences in information sequences. The codebook includes examples of each concept from news stories that are not part of the sample.

First, coders completed code details including their name in addition to information about each headline including each story's ID number and publication date and time.

Next, the coders accounted for absence or presence of variables in each header. Each variable included a coding scheme of 0 representing absence of that variable in the headline, or a 1 representing presence of that variable in the headline. The variables are the five following major questions: who, what, where, why, and how. I decided not to code for the question "when" because it is often implied with news information because of timeliness and the inherent purpose of the news reporting on current events. Coders took notes about the details they identified as each variable in the headline. The information in the details section was not analyzed, but the section was included in the code sheet to provide a visual reference to the order assignment in the next step of the coding process.

The coder also recorded the number of words included in the headline in an effort to gather as much data as possible while coding for potential future research. However, this data was not analyzed for this study.

Table 4

Header coding table for each variable

	No	Yes	Details
	0	1	
Question format			
“Who” answered in header			
“What” answered in header			
“Where” answered in header			
“Why” answered in header			
“How” answered in header			
Header Word Count			

After recording data about variable presence in the headline, the coder completed another table about the information sequences of how the variables were organized. Coders recorded sequential organization within the headline by assigning the order in which the question is answered in the headline. A score of 0 represented absence and sequential numbering began with 1 for the first question answered in the headline.

Table 5

Header coding table for header information sequence

	Order
“Who” answered in header	
“What” answered in header	
“Where” answered in header	
“Why” answered in header	
“How” answered in header	

Intercoder Reliability.

This research utilized human coders, the female researcher with a formal education and professional experience with journalism and another male coder who has not received a formal journalism education but has Bachelor's degree in Business Management and works in a testing lab writing procedures and definitions for a manufacturing company. Each person coded every headline in the sample. Using multiple coders establishes a coding process that yields similar results (Neuendorf, 2002). A minimum of two coders is necessary to conduct human-coding content analysis (Neuendorf).

Prior to coding, I conducted a pilot study with a subsample made up of 11 headlines from the content universe, which is 0.05 of the headlines for analysis. Each coder independently coded each headline in the subsample following the codebook to determine whether or definitions were clear and coders were both able to follow the guidelines (Wimmer & Dominick, 2011).

I led two separate training sessions for the pilot study with both coders. The researcher and each coder followed the codebook and coded 11 stories, which is 0.05 of the stories for analysis. I spoke with each coder about his or her results to understand discrepancies in code, and refined my definitions of variables in the codebook. After refining definitions, the coder with a Bachelor's degree and I coded the same 11 stories with more than a one-month time lapse between their first round of coding to check intercoder reliability before proceeding to code the complete universe of analysis.

I used ReCal2 (Freelon, 2010), an online reliability calculator, for percent agreement computations for each nominal variable to establish confidence in my codebook before beginning to code. I decided to proceed with coding after the additional coder and I achieved 100% agreement on the variables who, what, and where; and I achieved 90.9% agreement on the

variables why and how. I reached 90.9% on the organizational location of the variables who, what, why, and how; I achieved 100% agreement for the location of the variable where. I initially looked at Krippendorff's Alpha for each variable. Because I observed that my small samples skewed the statistic by not providing a Krippendorff's Alpha if there were 100% agreement and because my research was exploratory, I decided to proceed with coding based on percentage agreements. While doing so presents a risk of reaching low intercoder reliability, percentage agreements do provide insight in exploratory research. Each variable was not present in each of the 11 stories that were coded. Finally, the small sample size affected my decision to code the entire sample before running reliability checks during the process.

Krippendorff's Alpha is a popular agreement coefficient for nominal data (Neuendorf, 2002) that "generalizes across scales of measurement; can be used with any number of observers, with or without missing data; and it satisfies all the important criteria for a good measure of reliability" (Hayes & Krippendorff, 2007, p. 78). It calculates disagreements rather than correcting percent agreements (Hayes & Krippendorff). The statistic considers chance agreement, magnitude of misses, and it adjusts for which level of measurement was used for the variable (Neuendorf). Researchers suggest reliability above 0.80 (Krippendorff, 1980; Neuendorf; Wimmer & Dominick, 2011) for publication.

My initial intercoder reliability statistics were too low to continue with data analysis as displayed in Table 6. I used ReCal2 (Freelon, 2010) for the nominal variables that measured for presence of each concept, and I used ReCal OIR (Freelon, 2013) for ordinal variables that determined rank order for sequences with the latter yielding fewer details – Krippendorff's Alpha, N Cases, and N Decisions without including the Percent Agreement, N Agreements, and N Disagreements provided by the former test.

Table 6

First set of intercoder reliability results for entire universe of analysis

Variable	Percent Agreement	Krippendorff's Alpha	N Agreements	N Disagreements	N Cases	N Decisions
Who	95.8	0.38	207	9	216	432
What	94.4	0.47	204	12	216	432
Where	91.7	0.81	198	18	216	432
Why	91.7	0.53	198	18	216	432
How	84.7	0.33	183	33	216	432
Who Order	-	0.43	-	-	216	432
What Order	-	0.59	-	-	216	432
Where Order	-	0.83	-	-	216	432
Why Order	-	0.51	-	-	216	432
How Order	-	0.34	-	-	216	432

The additional coder and I discussed 47 headlines (representing 149 total disagreements) in detail, which is when we recorded our agreed resolutions to be used in the full sample. I identified two prominent trends of coder fatigue and researcher bias as the causes for disagreements. As we each read results aloud, one or the other would stop to say they should code it differently according to the codebook. Further, I noticed that on multiple occasions I relied on my own understanding of the variables and strayed from the codebook definitions.

After we each recoded the 34 remaining headlines ($n = 102$ total disagreements), we reached 100% agreement for each variable in each headline. I did not use the adjusted agreements for the 47 disagreements we used as discovery points for overall trends in disagreements. Once again, I used ReCal2 (Freelon, 2010) and ReCal OIR (Freelon, 2013) to calculate intercoder reliability and reached improved agreements.

Table 7

Second set of intercoder reliability results for entire universe of analysis

Variable	Percent Agreement	Krippendorff's Alpha	N Agreements	N Disagreements	N Cases	N Decisions
Who	96.8	0.45	209	7	216	432
What	97.7	0.85	211	5	216	432
Where	95.4	0.89	206	10	216	432
Why	95.8	0.74	207	9	216	432
How	91.2	0.55	197	19	216	432
Who						
Order	-	0.56	-	-	216	432
What						
Order	-	0.73	-	-	216	432
Where						
Order	-	0.91	-	-	216	432
Why						
Order	-	0.72	-	-	216	432
How						
Order	-	0.53	-	-	216	432

Based on the exploratory nature, I decided to proceed with data analysis and accept lower levels of agreement.

RESULTS

Research Question 1 asked which questions are answered most frequently in news story headlines on the iPhone app, Facebook newsfeed, and Twitter tweets, and the results displayed in Table 8 reveal that “who” was the variable that appeared most frequently in content published on both the iPhone app and Twitter. “What,” which is defined in the codebook as the action of the content, was the most common variable displayed on Facebook, but it was only present one more time than “who” on that platform. Of any platform, Twitter included the most examples of each variable with a total of 228 variables present compared to 209 and 63 included on the iPhone app and Facebook respectively.

Table 8

Number and percentages of totals for each frequency of questions answered on each platform

	iPhone App (n = 97)	Facebook (n = 25)	Twitter (n = 94)
Who	93 (96%)	24 (96%)	93 (99%)
What	89 (92%)	25 (100%)	84 (89%)
Where	21 (22%)	6 (24%)	32 (34%)
Why	3 (3%)	4 (16%)	9 (10%)
How	3 (3%)	4 (16%)	10 (11%)

Research Question 2 asked which question sequences were presented in the headlines on the iPhone app, Facebook newsfeed, and Twitter tweets. The data revealed 22 different organizational sequences with 50% that were only used once. Of the 50% (n = 22) used once, 36% were used on the iPhone App, 18% were used on Facebook, and 46% were used on Twitter.

None of the sequences included all five variables. The highest number of variables included in a sequence was four, which resulted in a total of seven different sequences in nine

different headlines, and they were used on Twitter ($n = 7$) and Facebook ($n = 2$). One sequence (who, what, where, how) emerged as the most common among these seven sequences as it was used in three different Twitter headers and one Facebook header.

“Who” was the first variable in 50% ($n = 22$) of all sequences, and it was placed beyond the second spot in a frequency in one sequence, which was only used once. It was included in 81% ($n = 22$) of the sequences and 97% ($n = 216$) of all headers. “What” was next most prominent variable to be first in 27% ($n = 22$) of the sequences. “Where” was the first variable in 23% ($n = 22$).

Table 9

Five most prominent question sequences by platform

Sequence	iPhone App	Facebook	Twitter
Who, What	57 (59%)	13 (52%)	37 (39%)
Who, What, Where	8 (8%)	2 (8%)	15 (16%)
Who	7 (7%)	0 (0%)	10 (11%)
Where, Who, What	8 (8%)	1 (4%)	8 (9%)
Who, What, Why	2 (2%)	2 (8%)	6 (6%)

The final Research Question 2A investigated potential differences in organization of questions sequences when comparing the headlines of story topics that were present once in each of the following platforms: iPhone app, Facebook newsfeed, and Twitter tweets. The variable “what,” a main action, was included in 100% ($n = 27$) of the headlines in this portion of the population. The sequence (who, what) was included in 22% ($n = 9$) across all three platforms, but all the other story topics provided additional variables on different platforms.

Table 10

Organizational sequences for stories with headlines once in each platform

Story Topic	iPhone App	Facebook	Twitter
509	Who, What	What, Where	Who, What, Where
515	Who, What	Who, What	Who, What
518	Who, What, Where	Who, What	Who, What
542	Who, What	Who, What	Who, What
543	Who, What	Who, What	Where, Who, What
562	Who, What, Where	Who, What, How	Who, What, Where
569	Who, What	Who, What	Who, What, Where
572	Who, What	Who, What, Why	Who, What
577	Who, What	Who, What, Why	Who, What, Where

DISCUSSION

Digital written communication is a growing field and information retention is a complex process. As people continue to access information from mobile devices writers must be aware of their writing process and strategize about readers' comprehension and information retention. My exploratory research sought to gain an understanding of the current state of news writing on digital platforms, including a mobile app and two social media outlets. Patterns emerged related to information sequences in headlines despite limited amount of space to disseminate information. Despite criticism of limited memory recall of information presented in the inverted pyramid story organization and its impact on perceived importance of content (van Dijk, 1985, 1986; Yaros, 2011), the inverted pyramid remains the dominant news article organization for newspaper outlets. My study revealed that most digital news story headlines presented on the iPhone app, Facebook, and Twitter are still presented in the inverted pyramid organization. The most common story sequence was "who, what," which represents subject verb, and each of those variables were included at the beginning of 77% ($n = 22$) of the sequences. "Where" was the only other variable to be at the beginning of sequences. "Why" and "how" were not included in the beginning of any sequence. As discussed my introduction, I collected data in summer 2012, and I focused my research on three digital platforms — iPhone app, Facebook, and Twitter.

Sampling Challenges.

In developing my research plan, I anticipated a larger number of articles would have had all variables across all platforms. I thought collecting data every hour would produce the necessary sample size to investigate new or revised headlines for coding. However, new stories did not appear often — less than an estimated 5% of the time each day. Further, editors did not

publish all stories across all platforms. Only 9 of the stories appeared across all three platforms – iPhone app, Facebook, and Twitter. Thus, my sample size was small and I expanded to code headlines that overlapped on at least two platforms for a total of 216 headlines for analysis.

Coding Challenges.

Three pervasive factors may have influenced coding and created challenges. First, coder fatigue may have contributed to incorrectly recording sequences and created a rush when coding. This became evident when the additional coder and I discussed disagreements. Second, researcher bias may have emerged from my journalistic training and comprehension of the variables. In some instances, I read into headlines and coded concepts according to my prior understanding and journalism expertise, and thus, I may have strayed from the codebook definitions. Third, I used coders who did not have journalism backgrounds to ensure my journalistic background did not skew my definitions of the variables (who, what, where, why, how) in the codebook. My approach established clear definitions that are repeatable for future research when using coders who do not have journalism backgrounds. One coder, who participated in only the pilot, did not have a college degree or formal journalism training, and the other coder, with a bachelor's degree and professional experience writing testing procedures for a manufacturing testing lab, participated in all coding. While I attempted to provide more openness by including one coder with and one without a journalism education and background, an additional coder with a journalism background allowed for more inferences about trends that do not fall within the quantitative definitions.

Variable Challenges.

My decision about variables revealed a weakness in my research; specifically, I decided to exclude the concept “when” from coding. This decision was rooted in two reasons. First, I did

not qualitatively observe many occurrences of “when” during my initial observations of iPhone app, Facebook, and Twitter stories. My rationale was to focus on variables overtly included in the headlines, and often times dates or days of the week are not referenced in headlines. Dates tend to be included as design elements, or they are provided within the full story. Second, I was teaching a team-taught introduction to mass media lecture class. In that class, for one assignment, students were asked to find examples of news values, but we did not accept analyzing “when” as a value because it is inherent to news as being information that is reported because it is current and relevant to that day. Upon further consideration, coding for all variables (who, what, where, why, how) would strengthen future research by completely tracking the type of information and when it is presented.

Future Research.

Future studies could focus on the newsroom and observe and record details about how different reporters in different settings write new content for different digital platforms. Future studies should collect data for quantitative and qualitative analysis. In addition, interviews with the different editors (or content writers for the different platforms) would also provide valuable qualitative data to supplement quantitative analysis of coded headlines. During my quantitative coding process, coding some headlines was challenging because they were written in a fragmented manner that did not clearly follow a complete thought. Further, one person appears to have written them because they followed a similar writing style. Researchers could also investigate differences in styles and the roots of those differences.

Future studies should refine variable definitions, which could explain the strong presence or absence of inverted pyramid organization. Some headlines started with odd wording that might be interpreted as a “how” or a “why,” and others lacked details need for clear coding. For

my research, I also observed the frequencies of “who” and “what” and compared them to a subject-verb sentence structure.

Future research could reduce the potential for coder bias related to the order of variable lists. I listed variables according to the inverted pyramid trends (who, what, where, why, how). The three most prominent variables in sequences were the first three in the list. Perhaps rotating the sequence presented in the codebook would reduce the potential for bias.

Coder background should be considered for future research. By including two outside coders and increasing the sample, and revising variable definitions, it will be easier to calculate intercoder reliability with a subsample rather than encountering the statistical issues of my small sample and finding 100% agreements in selected cases. Further, intercoder reliability should be checked at multiple times throughout the coding process, and if it remains high enough, researchers could divide the number of stories to be coded to reduce the workload for each coder. Finally, future researchers should include training about coder fatigue and set time limits for coding sessions.

CONCLUSION

My exploratory research discovered that despite the limited number of characters in headlines on the iPhone app, Facebook, and Twitter, organizational sequence patterns emerged in digital news writing. Some variables, “who” and “what,” (subject and action) were the most common variables included and were often the first variables included, which indicates that journalists are still following suggested best practices for information organization by presenting the most important information first. However, this could be problematic because it does not provide differences for the different devices audiences use to access the information, and it is a format that does not have proven reader retention.

Future research should use a larger sample to provide reliable data from which researchers can draw conclusions to guide industry and education. I sought to understand the current state of writing for digital media, which is the first step in determining what in-depth research is needed of digital media. As the dynamic industry continues to expand, more research is needed to help journalists gain insight about information presentation.

Writing instructors should devote more attention to teaching writing the full story for different digital platforms, including relevant social media sites under tight deadlines. Doing so will provide students the practice they need. In addition, assignments could provide opportunities for immediate publication.

Sending information to a printer no longer sets deadlines — deadlines are now 24/7. Writers face the challenge of providing information to readers in a timely manner across multiple platforms to help readers retain the information gained. Future media coverage and reporting should include writing for different digital platforms and organizing information to help readers

increase information retention by writing in a more conversational style according to the different platforms through the news cycle.

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News Story Delivery with New Media

Code Sheet Instructions

These instructions include examples and definitions to guide consistent content coding for a research project. The goal is to answer if the concept is present and determine its sequential order.

Code Details

First, complete code details about you, the coder, and each story's ID number and publication date and time.

Story ID Number: <u> F119 </u> Coder: <u> Jane Doe </u>
Publication Date and Time: <u>Saturday 10 a.m.</u>

Figure 1

Code Details example as formatted on coding sheet

Story ID Number

Stories need to be coded with a number and indicator of where the sample is from.

- A = abbreviation for iPhone app
- F = abbreviation for Facebook
- T = abbreviation for Twitter

Example: Story 119 from Facebook would be coded Story ID Number: F119

Coder

Each coder must include his or her name in the Coder location on the code sheet.

Example: Jane Doe would write her name Jane Doe

Publication Date and Time

Each story needs to be identified by publication date.

Screenshots include a code for date and time. The first number indicates day of the week starting with 1 for Sunday and ending with 7 for Saturday, the second number indicates time, and the letter indicates time of day with a for a.m. and p for p.m.

Example: Saturday 10 a.m. screenshots are coded 7_10_a

Follow day of week, hour, and time of day codes to record publication date and time on the code sheet.



Figure 2

Code for Facebook Header Example

Header and Story Summary Differences

Figure 3 is an image of the screenshot from the app to demonstrate the differences between a header and a story summary. This difference is only evident in screenshots of the app. Make sure you only code the header and only count words in the header.

- The header is in bold and is in a **serif font**
- The smaller sans serif font is the story summary below the header.
- *If the word is cut off and continued with ellipses, it should not be included in word counts or coded as part of the content.*

Example:

Header: **Steven Pearlstein: Caterpillar to unions: Drop dead**

Story Summary: Thanks to globalization, declining union density and years of chipping away at labo...

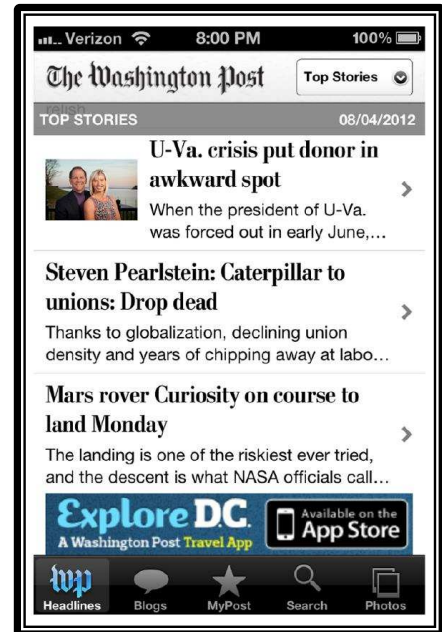


Figure 3
*Header and Story Differences
Screenshot Example*

Facebook and Twitter do not have separate headers and story summaries and will be coded for all visible content in full word increments. Links are not coded or included in the word count. See Figure 4 for an example of a Facebook header and Figure 5 for an example of a Twitter header.



Figure 4
Facebook Header Screenshot Example



Figure 5
Twitter Header Screenshot Example

Header Information

This section is intended to gather information about the content included in the story header. The categories you will record are related to whether or not key questions are answered within the header.

Header Information			
	No 0	Yes 1	Details
Question format			
“Who” answered in header		1	Iraqi people
“What” answered in header		1	struggle to build peace and prosperity
“Where” answered in header	0		-
“Why” answered in header		1	ruins of war
“How” answered in header	0		-
Header Word Count	20		

- First, indicate whether or not the question is answered in the story header.
 - Add a code of 0 in the No column if the question was not answered.
 - Add a code of 1 under the Yes column if the question was answered.
 - The first topic is considered the main topic and the only one to be coded.

**Be aware that some questions may not be answered in the information available in the header.*

- Second, record the details you consider to be the defining concepts for answering the question.

** Be aware that not every word in the header will fall into one of the question coding categories.*

- Finally, you will count the number of words included in the header.

We are not coding for “when” because it is often implied with news information and rarely the main question to answer.

Header Word Count

Count the number of words in the header and record that number in the Header Word Count cell.

- Only count full words. Some words get cut off with ellipses (...), and those words should not be counted.
 - labo... would not be counted as a word because the full word is not present.
- Numbers should be counted as a single word.
 - 15 is counted as one word.
- Any hashtag (#) phases should be counted as one word.
 - #ResearchFunContinues is counted as one word rather than three words.
- Links should not be included for word counts.
 - <http://wapo.st/MoJKzj> is an example of a link that could appear in a header.

Header Information Sequence

Indicate the order in which the question information is included in the header. Refer back to the Details column in the Header Information portion of the coding sheet to help you reference which information you identified to be the answer to the question to help you assign the sequential order for concepts in the header.

Begin with 1 as the first question answered in the header.

Header Information Sequence

	Order
“Who” answered in header	1
“What” answered in header	2
“Where” answered in header	- (<i>implied</i>)
“Why” answered in header	-
“How” answered in header	-

Example 1 from app: 7 months after the last U.S. troops left, Iraqi people struggle to build peace and prosperity in ruins of war.

Example 2 from app: Mars rover Curiosity on course to land Monday

Mars = where = 1 for location in header

rover Curiosity = who (or subject) = 2 for location in header

land = what = 3 for location in header

**We do not code Monday because it is when.*

Questions Defined

WHO

This is the agent (subject of the header) and can include people, organizations, objects, or ideas. It is the subject of the sentence.

Examples:

7 months after the last U.S. troops left, **Iraqi people** struggle to build peace and prosperity in ruins of war.

3 American **friends** tackle and hogtie gunman aboard European train

U-Va. Crisis put donor in awkward spot

Photos provide keepsakes for parents grieving the death of a newborn

A Maryland county's **nickel tax for plastic bags** is paying off, but not as planned

Donald Trump praises Saddam Hussein for killing terrorists 'so good'

Ryan to meet with House officials on investigation of Democratic sit-in on gun legislation

For the fourth straight day, **Trump** faces criticism on Star of David tweet

Fireworks-related **fire** breaks out in Aurora

WHAT

This is the main concept of the header and more of the action. This defines the purpose of the header. This is the concept that happened. If this concept is present, it will answer the question “what happened” or is currently happening.

Examples:

7 months after the last U.S. troops left, Iraqi people **struggle to build peace and prosperity** in ruins of war.

3 American friends **tackle and hogtie gunman aboard European train**

U-Va. Crisis **put donor in awkward spot**

Photos **provide keepsakes** for parents grieving the death of a newborn

A Maryland county’s nickel tax for plastic bags **is paying off**, but not as planned

Donald Trump **praises Saddam Hussein** for killing terrorists ‘so good’

Ryan to **meet with House officials** on investigation of Democratic sit-in on gun legislation

For the fourth straight day, Trump **faces criticism** on Star of David tweet

Fireworks-related fire **breaks out** in Aurora

WHERE

This is the location of the story. A specific physical location must be included in the header to be counted as answering the where concept. The words “in” or “on” can be good indicators to denote a specific location rather than a broad location, but they are not always present when a specific location is present in a header.

Examples:

7 months after the last U.S. troops left, Iraqi people struggle to build peace and prosperity in ruins of war.

Iraq is implied by underlined cues, however, it is not clearly stated in the header.

Not apparent in this example.

3 American friends tackle and hogtie gunman aboard **European train**

U-Va. Crisis put donor in awkward spot

Not apparent in this example because awkward spot is not a specific physical location.

78 PFA crews responding to possible fire west of Horsetooth Reservoir

Not apparent in this example because “west of Horsetooth Reservoir” is not a specific location.

Fireworks-related fire breaks out in **Aurora**

WHY

This is the cause of the action. This is the reason behind the main concept of the story, and it must be overtly stated in the header.

Examples:

7 months after the last U.S. troops left, Iraqi people struggle to build peace and prosperity in ruins of war.

Not apparent in this example.

3 American friends tackle and hogtie gunman aboard European train

Not apparent in this example.

U-Va. Crisis put donor in awkward spot

Not apparent in this example.

Donald Trump praises Saddam Hussein **for killing terrorists 'so good'**

Ryan to meet with House officials on **investigation of Democratic sit-in on gun legislation**

For the fourth straight day, Trump faces criticism on **Star of David tweet**

HOW

This concept provides more specific details about the action and the way the main concept of the header happened.

Examples:

7 months after the last U.S. troops left, Iraqi people struggle to build peace and prosperity in ruins of war.

Not apparent in this example.

3 American friends tackle and hogtie gunman aboard European train

Not apparent in this example.

U-Va. Crisis put donor in awkward spot

Not apparent in this example.

A Maryland county's nickel tax for plastic bags is paying off, but **not as planned**

Fireworks-related fire breaks out in Aurora

Code Sheet Example

7 months after the last U.S. troops left, Iraqi people struggle to build peace and prosperity in ruins of war.

Header Information			
	No 0	Yes 1	Details
Question format			
“Who” answered in header		1	<i>Iraqi people</i>
“What” answered in header		1	<i>struggle to build peace and prosperity</i>
“Where” answered in header	0		-
“Why” answered in header	0		-
“How” answered in header	0		-
Header Word Count	20		

Header Information Sequence	
	Order
“Who” answered in header	1
“What” answered in header	2
“Where” answered in header	- (<i>implied</i>)
“Why” answered in header	-
“How” answered in header	-

APPENDIX B

News Story Delivery with New Media Coding Sheet — August 2015

Story ID Number: _____

Coder: _____

Publication Date and Time: _____

Header Information

	No 0	Yes 1	Details
Question format			
“Who” answered in header			
“What” answered in header			
“Where” answered in header			
“Why” answered in header			
“How” answered in header			
Header Word Count			

Header Information Sequence

	Order
“Who” answered in header	
“What” answered in header	
“Where” answered in header	
“Why” answered in header	
“How” answered in header	