Scrolling For Story

How Millennials Interact with Longform Journalism on Mobile Devices

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Key Facts

Millennials Read to Learn. Even with so many media elements on a mobile screen, eye tracking showed that Millennials read the text, particularly the main story. In post-session interviews, they said they read in order to learn about topics that interest them.

Apps Add an Edge. Millennials found interactive applications that were well integrated within the narrative flow of longform narratives to be "cool" and "engaging." However, Millennials were turned off by technical glitches and interactive elements that removed them from the context of the story.

Subject Matter Matters. Participants in focus groups and individual interviews said they were most likely to read and share longform projects if they found the topic to be important and relevant to their interests and geographies.

More Time on Text and Video, but More Praise for Images. Eye-tracking study participants spent a great deal of time on video and text, but feelings on both were often mixed. In post-session interviews, most participants reported liking the photographs in all but one presentation, where the photographs seemed like clip art and didn't help tell the story. Photographs got the most positive comments of all the elements; infographics were identified as the best element in three of the four projects studied.

The Future is (Even More) Visual. Millennials who designed their own longform mobile stories on cellphones cut the text by three-fourths and increased the use of infographics, video, and interactive images. In individual interviews, participants said they preferred stories in which long passages of text were broken up by visual elements.

Scrolling for Story: By the Numbers

4 separate studies—eye tracking, semi-structured interviews, focus groups and paper prototyping

2 distinct regions of the U.S.

53 participants

86.8% ages 18-29

58.5% female

39.6% Latino or Hispanic

58.5% are currently in school.

67.9% use a tablet at least weekly to get news

Introduction: From “Snow Fall” to Today

Since the late 1990s, as breaking news and other types of journalism adapted, Proteus-like, to every kind of screen (Barnhurst, 2012; Benton, 2014), long feature stories remained best suited for print. Written in the narrative tradition, often using literary techniques, this kind of journalism clashed with the nonlinear nature of the web where information was best consumed in visuals and quick bits. Then, in 2012, *The New York Times* published “Snow Fall: The Avalanche at Tunnel Creek,” a 17,000–word narrative so infused with video, infographics, and impressive design elements that its title became a verb to describe the many similar works that followed (Dowling & Vogan, 2015).

“Snow Fall” was designed for the new “lean-back” platform, the tablet computer. It featured multimedia elements that were artfully included in the text in a way that added to the readers’ experience of the story. Soon afterward, *Medium’s* Bobbie Johnson created an open Google spreadsheet called “Snowfallen Stories,” where producers logged hundreds of similar works into what essentially became a clickable index of the form (Johnson, 2013).

The “Snowfallen” now go by various other names, including “multimedia narrative” and “digital longform.” The genre’s identifying characteristic: writing of at least 2,000 words integrated with purposeful multimedia, including photographs, video, infographics, and web applications (for review, see Jacobson, Marino & Gutsche, 2016). A broad spectrum of media outlets produce this work, including legacy news organizations, startups, and nonprofit outlets, as simplified technology and often-free, drag-and-drop web templates have made this work easier to produce and consume (Fisher, 2015; Halpern & Humphreys, 2014; Hiippala, 2016).

However, the rapid propagation of the form has resulted in much debate about the value—and meaningfulness—of the work (Chyi & Chadha, 2012), and scholars have argued that this work constitutes a new genre of literary journalism

(ie Jacobson, Marino & Gutsche, 2016). Yet, the use of literary devices, such as characterization, scene and dialogue, isn't present in all of these pieces. Some would be better classified as in-depth, even investigative, journalism.

How Effective Is Digital Longform Journalism?

Early benefits of producing "Snow Fall"-like works included prestige (Dowling & Vogan, 2015) and engagement. Jill Abramson, then the *Times'* editor, told her staff the project garnered a remarkable number of page views (3.5 million) and kept readers for about 12 minutes on average (Romenesko, 2012). The presentation received a Peabody Award in 2012 as well as the Pulitzer Prize for Feature Writing in 2013. Other digital journalism outlets, including *BuzzFeed*, *Politico* and *SB Nation*, created their own original longform work.

Soon after the publication of "Snow Fall," however, bloggers and commenters debated whether the presentation was worth the time and resources spent producing it. Media critics predicted that the audience would not care to see much more longform work with "Snow Fall"-like multimedia. Farhad Manjoo, writing in *Slate*, called "Snow Fall" "an example of excess, a moment when designers indulged their creativity because they now have the technical means to do so, and not because it improved the story or the readers' understanding of it" (Manjoo, 2013).

Even the term, "longform" (or "long-form") came under attack. "Journalists presumably care about words as much as anyone, so it is mysterious that they would choose to promote their stories by ballyhooing one of their less inherently appealing attributes," wrote James Bennet in *The Atlantic*. "Do we call certain desserts "solid-fat-form food" or do we call them cakes and pies?" (Bennet, 2013)

Three years later, however, there is new hope for the form. Research suggests that story length, a defining characteristic of digital longform, is not an immediate deterrent. According to a study of online viewing behavior by Pew Research Center, readers are engaging with longform content on mobile devices, spending more time on average with longform news articles than with short-form articles, 123 seconds for articles 1,000 words or longer compared to 57 seconds

for shorter stories. As the Pew study states, “When it comes to the relative time consumers spend with this content, long-form journalism does have a place in today’s mobile-centric society” (Mitchell, Stocking & Matsa, 2016).

What Do Audiences Want?

Although a great deal of longform journalism is being published, little is known about how those audiences interact with longform stories and why (for recent study, see Mitchell, Stocking & Matsa, 2016). Even though the technology to render these works in digital space is simpler and cheaper than it was in 2012, original in-depth, investigative, or literary journalism infused with purposeful multimedia remains relatively time-consuming and expensive to produce.

As the news industry attempts to capture audiences on the spread of mobile adoption (Anderson, 2015), it is vital not only to understand how users experience mobile media, but how users experience media that are made to be accessed on multiple platforms, such as laptops, cellphones, and tablets. In this project, we refer to “mobile” as being cellphones and tablets, items that have increased in affordability, innovation, and prominence among Millennials and other news audiences (Westlund, 2013).

In order to better understand the long-term sustainability of digital longform journalism—that is, whether the audience can make it economically feasible for news organizations to continue to produce longform work—an analysis of audience receptivity is required. Using both qualitative and quantitative measures in September 2015 through January of 2016, we interviewed 53 Millennials to gauge this audience’s reception to longform multimedia journalism delivered on mobile platforms.

This study focuses specifically on the interests and needs of Millennials—those born after 1980 and before 2000 (Fry, 2015). Millennials make up the largest labor force in the U.S. and a significant amount of the desired mobile news and other media audience. Millennials are less likely to pay for news than for entertainment, such as music, movies and video games. However, a recent study showed that Millennials do regularly use and often pay for news or news

products. (American Press Institute, 2015). We attempted to understand the degree to which this demographic group responds to longform digital journalism.

Methodologies

This project is comprised of four separate studies, each of which was designed to address specific aspects of longform multimedia and mobile journalism. We applied four distinct methods, explained below: eye tracking, semi-structured interviews, focus groups, and paper prototyping.

Participants

Participants for these studies were based in Kent, Ohio, where researcher Jacqueline Marino is a faculty member at Kent State University, and in Miami, where Susan Jacobson and Robert E. Gutsche, Jr., are on faculty at Florida International University. Eye tracking was conducted at Kent State, and the other three methods were done at FIU. To participate in each study, individuals needed to be Millennials, as defined above. To participate, individuals also must have been regular tablet computer users. A total of 53 individuals participated in this research (Chart 1) between October 2015 and January 2016. See Appendix A for a chart with all participant demographic data.

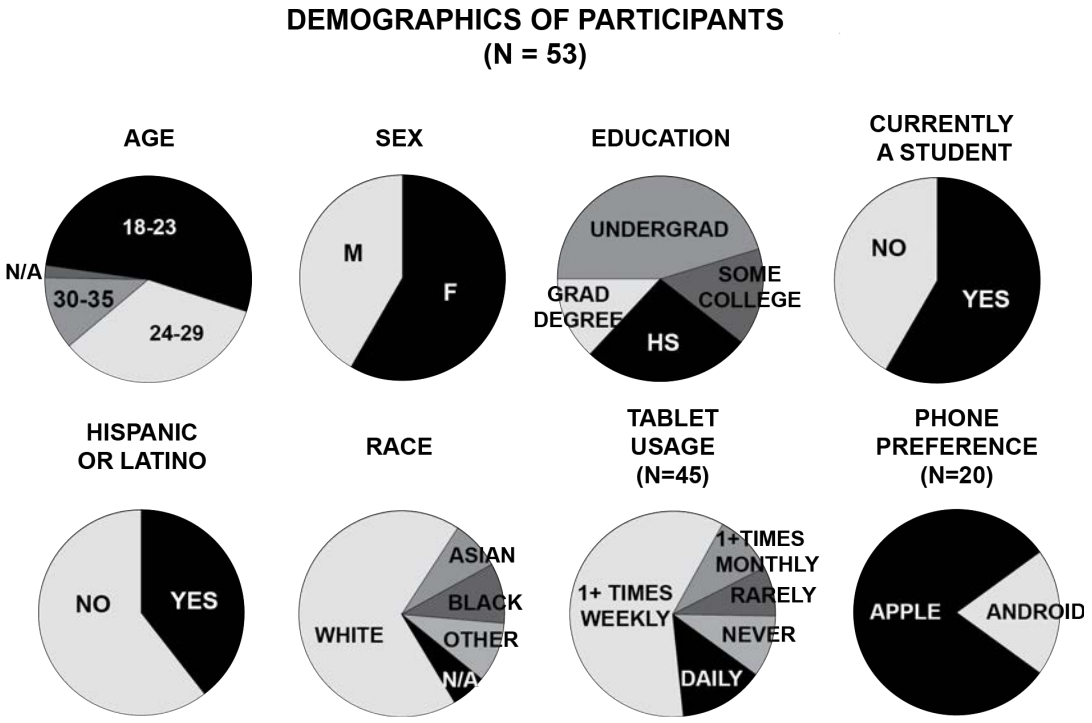


Chart 1. Participant data from all four studies.

Researchers worked together to construct consistent questionnaires and processes for conducting and interpreting participant data and received appropriate approval from both universities' Institutional Review Boards.

Selection of Longform Projects

To maintain consistency for what participants would view across the studies conducted for this report, researchers selected the following longform projects that were published in 2013 or 2014 by news organizations in the United States and Europe (Table 1):

Project Title	Publisher & Year	Description & URL	In-Text Reference	Used in Study
"Colleges flush with cash saddle poorest students with debt"	ProPublica 2015	Examines issues of college student debt. propublica.org/article/colleges-flush-with-cash-saddle-poorest-students-with-debt	College Debt	Interviews

“Firestorm”	The Guardian 2013	Describes one family’s experience with a bushfire in Tasmania. theguardian.com/world/interactive/2013/may/26/firestorm-bushfire-dunalley-holmes-family	Firestorm	Eye tracking, Focus Groups
“Losing ground”	ProPublica 2014	Explains effects of climate change on Louisiana land masses. https://projects.propublica.org/louisiana/	Losing Ground	Interviews
“Miami Beach at 100”	Fusion 2015	Explores sea level rise and development in Miami Beach, Florida. http://fusion.net/story/109661/miami-beach-at-100-the-sea-is-rising-and-so-are-the-condos-somethings-gotta-give-right/	Sea Level Rise	Interviews, Focus Groups, Prototyping
“The Parable of the Polygons”	Vi Hart and Nicky Case 2014	Uses design to express issues of diversity. http://ncase.me/polygons/	Polygons	Interviews
“Planet Money Makes a T-Shirt”	National Public Radio 2013	Examines the global process of making t-shirts sold in America. http://apps.npr.org/tshirt/	T-Shirt	Eye tracking
“Rebuilding Haiti”	Produced by a team of French journalists funded by the European Journalism Centre and published on Rue89 (France), 2014	Allows users to work through challenges of rebuilding Haiti. http://apps.rue89.com/haiti/en/	Haiti	Eye tracking, Interviews, Focus Groups
“Your Meat Addiction is Destroying the Planet (But We Can Fix It)”	TheVerge 2013	Explores the world of cultured beef. theverge.com/2013/8/13/4605528/your-meat-addiction-is-destroying-the-planet-but-we-can-fix-it	Meat Addiction	Eye tracking, Focus Groups

Table 1. Longform multimedia projects accessed for this study.

These projects were selected for both journalistic quality and a diversity of both subject and elements as established by industry experts (ie Johnson, 2013) from both legacy and new media outlets, including elements such as text, photographs, infographics, video, and web applications. Subjects ranged from an out-of-control bushfire in Tasmania (*The Guardian*) and rebuilding Haiti following

an earthquake (*European Journalism Centre team, published on Rue89*) to cultured beef (*The Verge*) and the economics of T-shirt-buying in America (*National Public Radio*). All projects qualified as longform journalism based upon word count and the purposeful integration of multimedia elements (Jacobson, Marino & Gutsche, 2016).

Study 1: Eye tracking

Eye tracking is a method of determining exactly where a user looks and where his or her gaze "fixates" on a screen, in this case on screens featuring digital longform journalism projects (Nielsen & Pernice, 2009). The Poynter Institute has been eye tracking news audiences since the 1990s, and we used Poynter's past studies, especially EyeTrackO7's study of online news, to guide our methodology (Adam, Quinn & Edmonds, 2007). In the Scrolling for Story study, we wished to understand what particular elements, including design, video, and text, drew—and retained—users' attention in four specific projects (Figure 1).

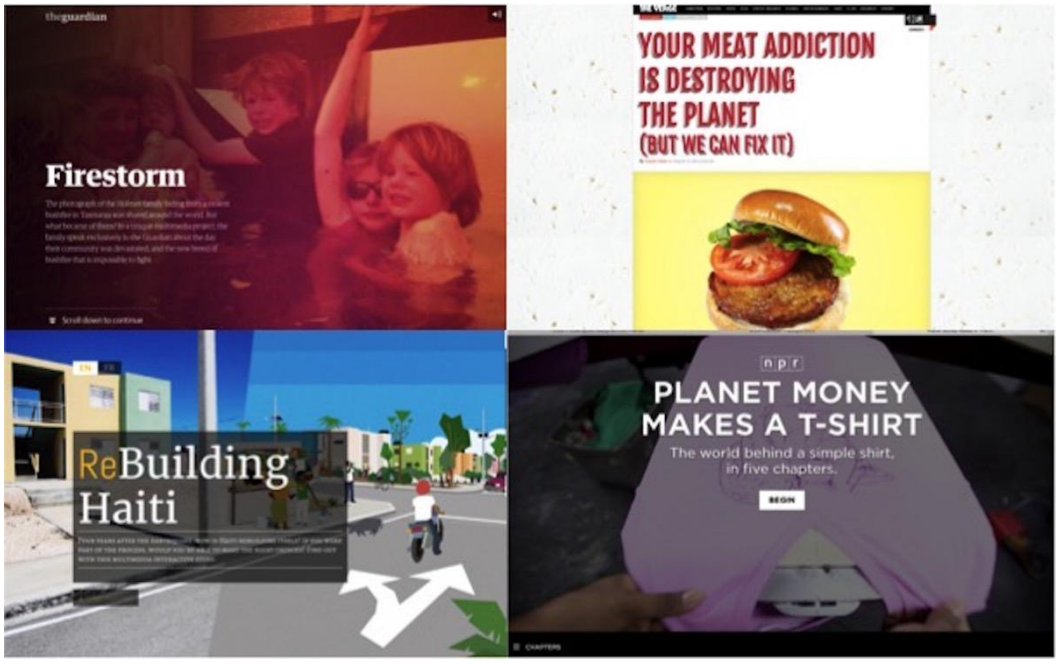


Figure 1. Projects used in the eye tracking study (clockwise from top left): The Guardian's "Firestorm," The Verge's "Your Meat Addiction is Destroying the Planet," Planet Money/NPR's "Planet Money Makes a T-Shirt," and European

Journalism Centre/Rue89's "Rebuilding Haiti," Screenshots from the homepages of the projects.

In September 2015, Marino began recruiting 15 participants (Chart 2) in Kent, Ohio. At IdeaBase, a design firm of Kent State University's College of Communication and Information, a user experience designer fitted each participant to the Tobii Glasses 2, a lightweight mobile eye tracker.

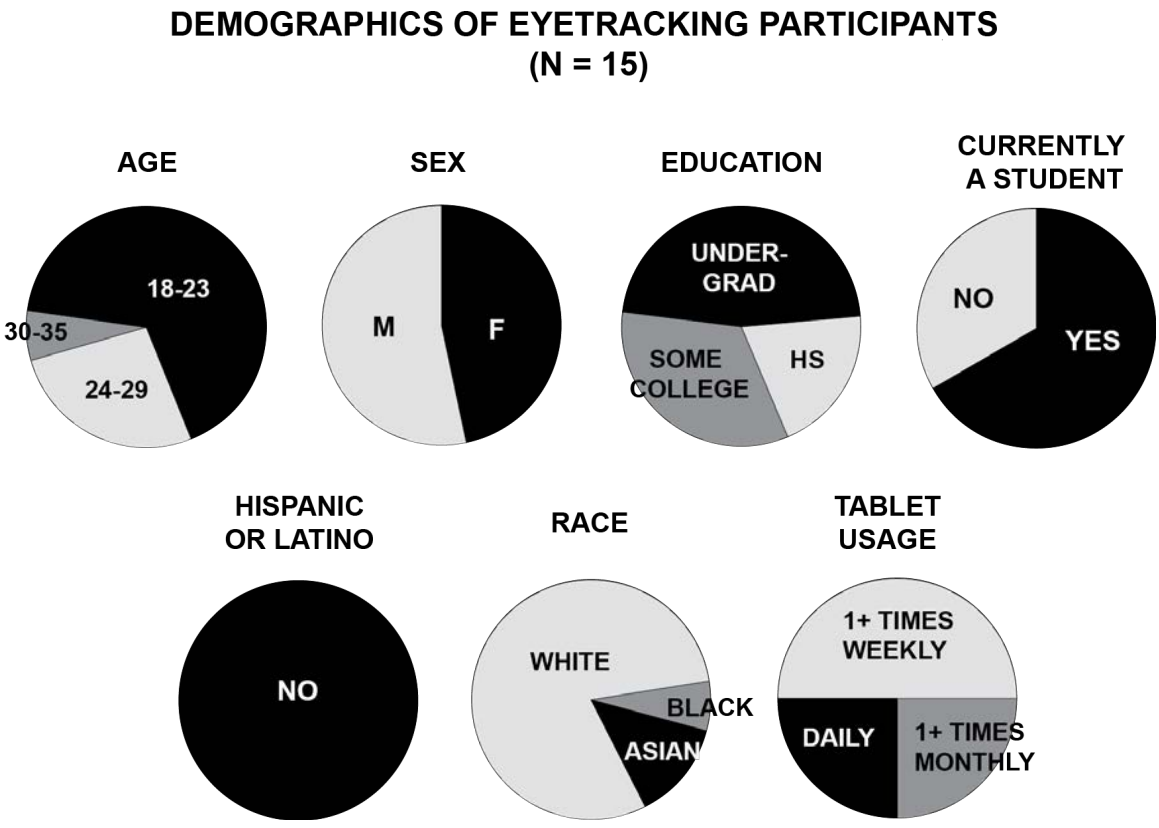


Chart 2. Participant Data for Eye tracking Component.

While wearing the glasses, participants were asked to interact with one of the four digital longform projects on an iPad. Participants were asked to select any project from a list of four. On a separate monitor, researchers viewed real-time, high-definition video of where the participants looked on the screen, which was indicated by a red ring (Figure 2).

Participants were allowed to stop viewing the project when they wished. After 10 minutes, researchers asked participants to end their viewing and inquired about what the participants liked and didn't like about the project they had viewed. After the interview, participants were asked to select a second presentation of their choice and the process was repeated once more.

Figure 2. While eye tracking participants interact with projects on iPads, their point of gaze is indicated by a red ring moving across the screen. The researchers watch this on another screen in real time. Screenshot by Jacqueline Marino.

Once all participant sessions were completed, researchers exported the raw data into Tobii Glasses Analysis Software. Researchers recorded the number of participant "fixations," locations on the longform projects where participants' eyes paused to take in information (Holsanova, Rahm & Holmqvist, 2006) (Figure 3). These pauses are important to study because they indicate the place on the screen where some kind of visual or cognitive processing, such as thinking, is occurring. Researchers also recorded the duration of fixation, as long as the fixation was at least 300 ms, a measurement that indicates a fixation is likely to have taken place (Salvucci & Goldberg, 2000; Stanton, 2013).

Using a codebook that identified fields of content within each longform project, including story text, video, photographs, headlines, and interactive graphics (See Appendix B), researchers matched fixations to the appropriate category, exported them to Excel spreadsheets and determined cumulative fixation totals and durations for each element, each project, and overall.

Figure 3. A heat map indicates where participants in the eye tracking study fixated on the "Rebuilding Haiti" project. Screenshot by Christopher Hallahan.

In addition to having participants' fixations recorded and categorized in Tobii software, the participants were encouraged to discuss their interactions with the longform project after they experienced it. Their comments were audiorecorded and transcribed. Researchers then conducted qualitative textual analysis (Lindlof & Taylor, 2011) of participants' answers to interview questions about their interests in the projects and their experiences interacting with the elements on the iPad.

Study 2: Semi-Structured Interviews

In Miami, Susan Jacobson interviewed 18 tablet computer users (Chart 3) to evaluate longform multimedia news projects that include Web applications as part of the story presentation.[1] Each participant reviewed two to three stories, selected from a menu of five possible stories. Researchers viewed and recorded participant interaction on the iPad by connecting the tablet to a second monitor.[2] (Figure 4)

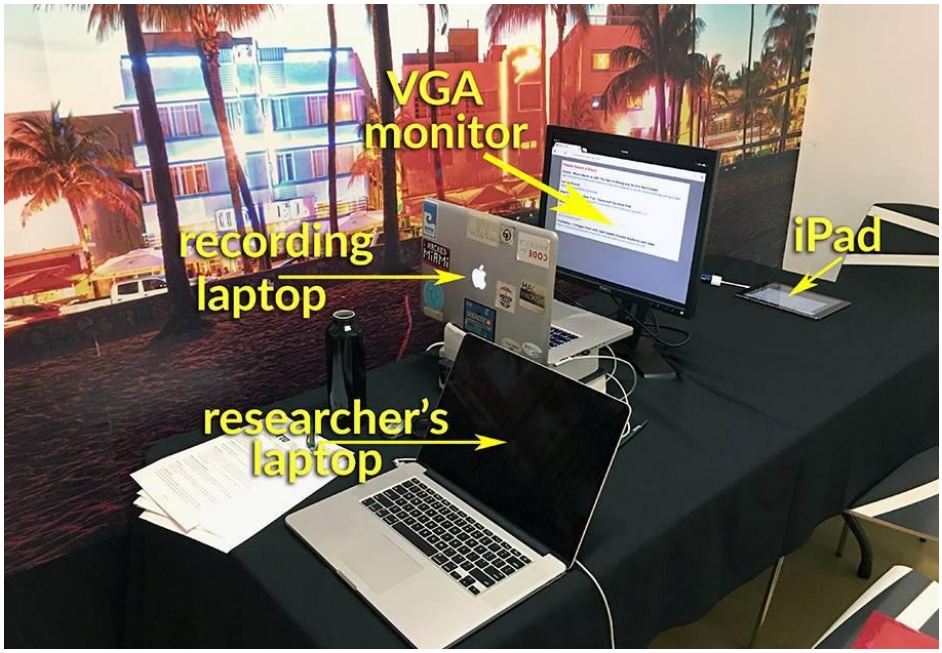


Figure 4. Configuration for viewing and recording participant activity on an iPad. Photoillustration by Susan Jacobson.

[1] None of the news applications in this study are "native" apps that can be downloaded as standalone works from the iTunes or Google Play stores; however, they have similar features to such apps.

[2] It is not easy to record the iPad screen. The iPad exports video via the Lightning port, and Mac laptops take in video through a Thunderbolt port. There is no Lightning-to-Thunderbolt cable adaptor, as this online discussion onapple.com makes clear: https://discussions.apple.com/thread/5134979. Apple recommends using the wireless AirPlay system, but we found AirPlay and other wireless systems (like Reflector 2 http://www.airsquirrels.com/reflector/) create an unreliable connection between the iPad and the viewing/recording device that had to be re-started every few minutes. This was not an acceptable level of performance for our research, so we devised a system, depicted in the photo, where we recorded a VGA monitor.

Researchers let the participants choose a story, and then gave them a few minutes to read and interact with it on an iPad while the researchers viewed their actions on a larger screen connected to the tablet. We invited the participants to "think aloud" while they interacted with the works, stating what they liked or did not like, or any other thoughts or ideas that came to them while interacting with the piece. After a few minutes, the researchers interrupted the participants to ask them questions about their experience with the work in a semi-structured interview.

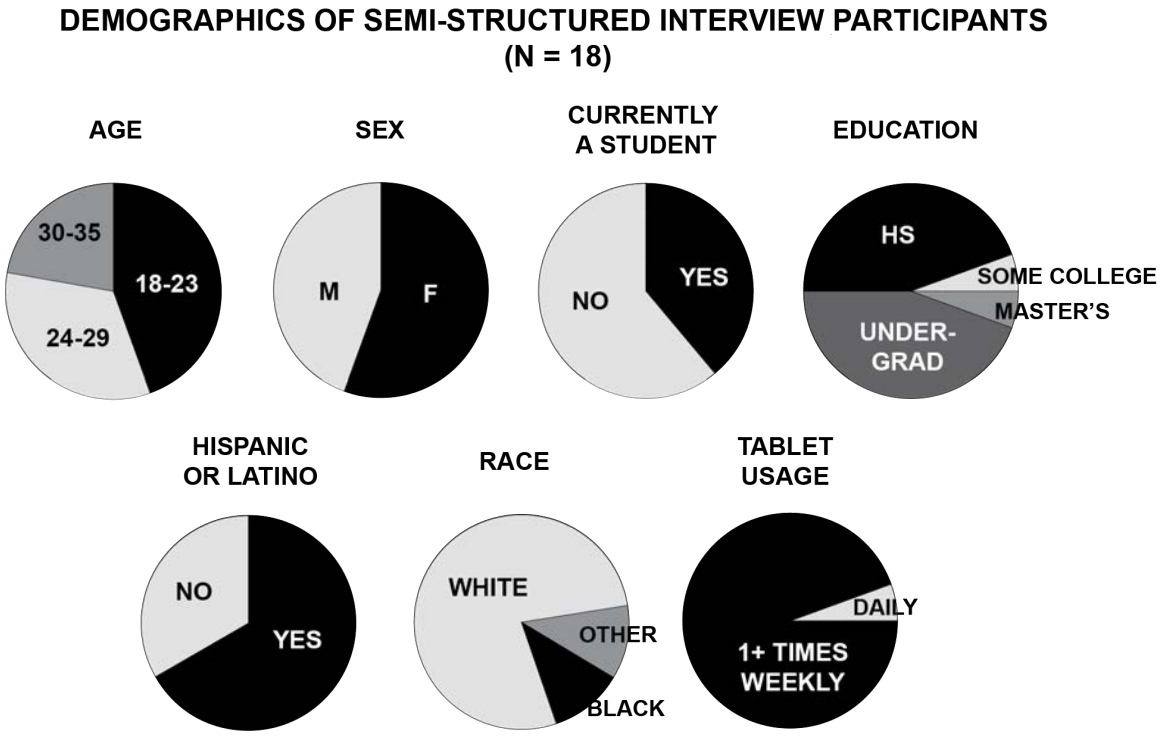


Chart 3. Participant data for semi-structured interviews component.

The think-aloud protocol asks participants to verbalize the actions they are taking and the choices they are making while interacting with a media or technology presentation or product (Barnum, 2011). This protocol is sometimes used in conjunction with semi-structured interviews, particularly when researchers are investigating audience response to media and technology presentations and products (Ahmad, 2014; Eveland & Dunwoody, 2000;

Jameson, 2013). These “conversations with a purpose” (Richie & Lewis, 2003) are then coded and grouped into categories so that researchers may identify themes and patterns of experiences and behavior and then expound upon them (Buddenbaum & Novak, 2001; Wimmer & Dominick. 2000).

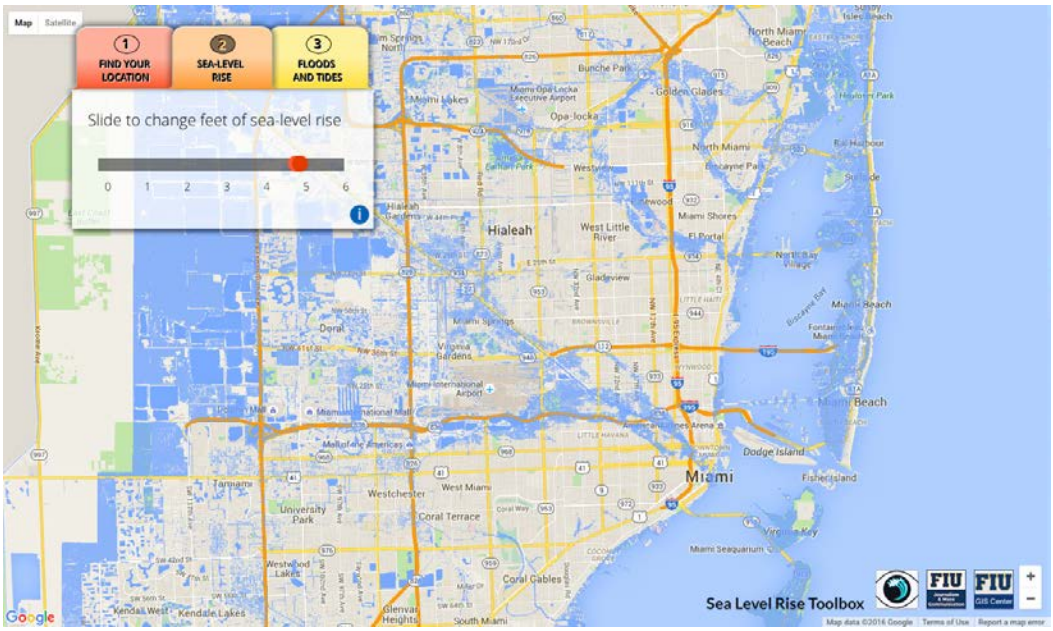


Figure 5. This web-based app shows the possible effects of rising seas and appeared in *Fusion*’s “Miami Beach at 100” article assessed by participants in this study’s semi-structured interviews and paper prototyping. Screenshot from eyesontherise.org.

Study 3: Focus Groups

Robert E. Gutsche, Jr., at Florida International University in Miami conducted two focus groups in October 2015 (Chart 4) to compare how users interact with longform projects on cellphones compared to laptops. Focus groups (Figure 6) have been established as a means to create collaborative, creative, and productive environments for understanding audience interactions with media (Baier, Cooper, Wysocki & Gravenstein, 2015).

Figure 6. Students at Florida International University piloted focus groups for this study. Photograph by Robert E. Gutsche, Jr.

Individually, focus group participants viewed “Firestorm” on laptops for a period of 20 minutes. Researchers then led a group discussion about participants’ experiences with the content, including what participants did and did not prefer about the project and what elements of the presentation and user experience provided them enjoyment.

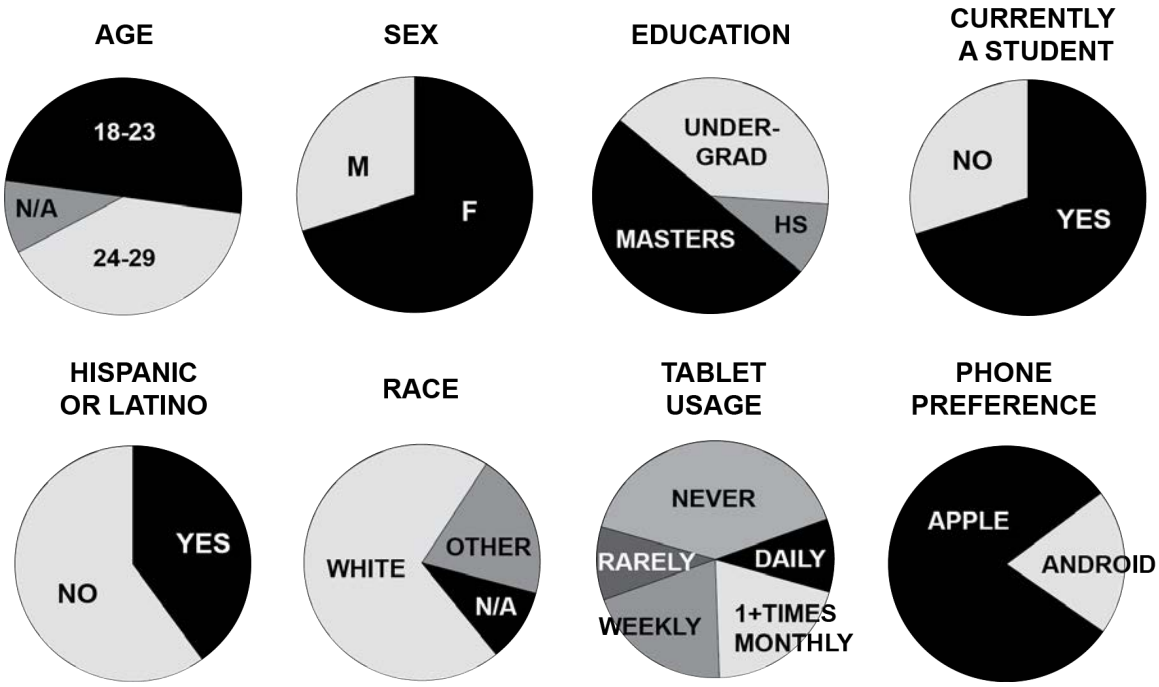


Chart 4. Participant data for focus groups component.

Next, participants viewed the same project on their cellphones. Participants were encouraged to either begin interacting with the project from its beginning or to view it based upon where they ended their interaction on the laptop (Taipale & Fortunati, 2014). This process was repeated with “Meat Addiction,” “Haiti,” and “Sea Level Rise.”

After a period of 20 minutes, participants discussed with the group what struck them about their interactivity on the cellphone and how their enjoyment and experience varied between the two screens. All discussions were audiorecorded and transcribed for analysis, and a trained graduate student also took notes of key themes during the discussions.

Study 4: Paper Prototyping

Paper prototyping provides users with pens, paper, and other tools, such as glue and markers, to imagine their most desirable interface (Aikat, 2014;

Snyder, 2003). By working in teams, the collaborative process encourages creativity and focuses on usability of online products (Andrews, Burleson, Dunks, Elmore, Lambert, Oppegaard, Pohland, Saad, Scharer, Wery, Wesley & Zobel, 2012). This method added a deeper perspective on interactivity by putting participants in the position to express what storytelling elements they prefer and to describe how and why they would interact with those elements. (Figure 7)

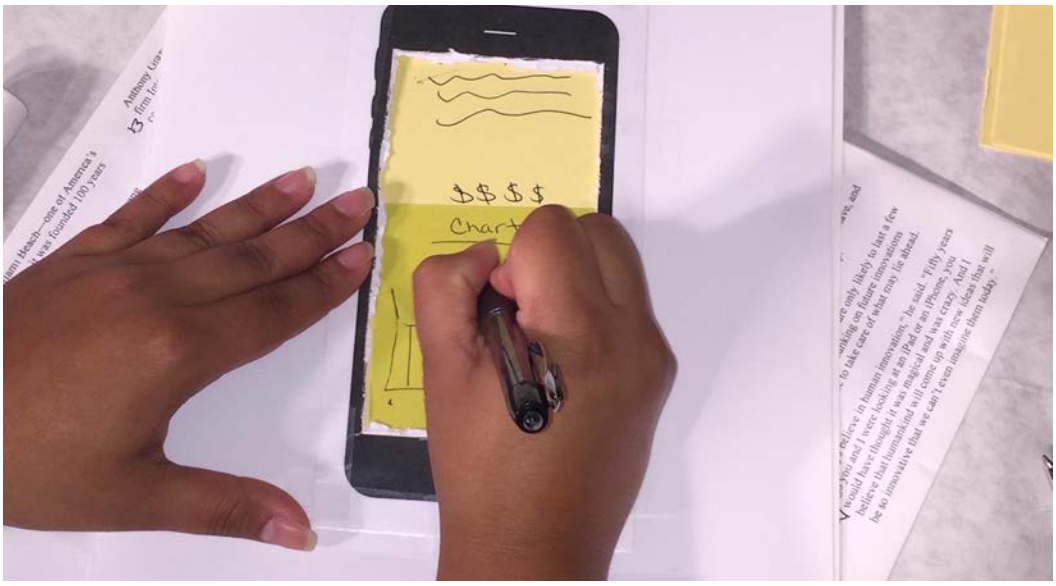


Figure 7. Participants in a pilot study used an iPhone paper prototype to express their desired longform mobile design. Photograph by Robert E. Gutsche, Jr.

In November 2015, Gutsche recruited participants for four focus groups (Chart 5). They were tasked with recreating *Fusion*'s "Miami Beach at 100" article, which included the Sea Level Rise Toolbox as a central feature of the storytelling about rising seas (Figure 5). In addition to viewing the online project as a group, participants were supplied with the original story text, a list of possible interactive features that they could use to recast the story in a mobile design, and a paper prototype of an iPhone 6 Plus.

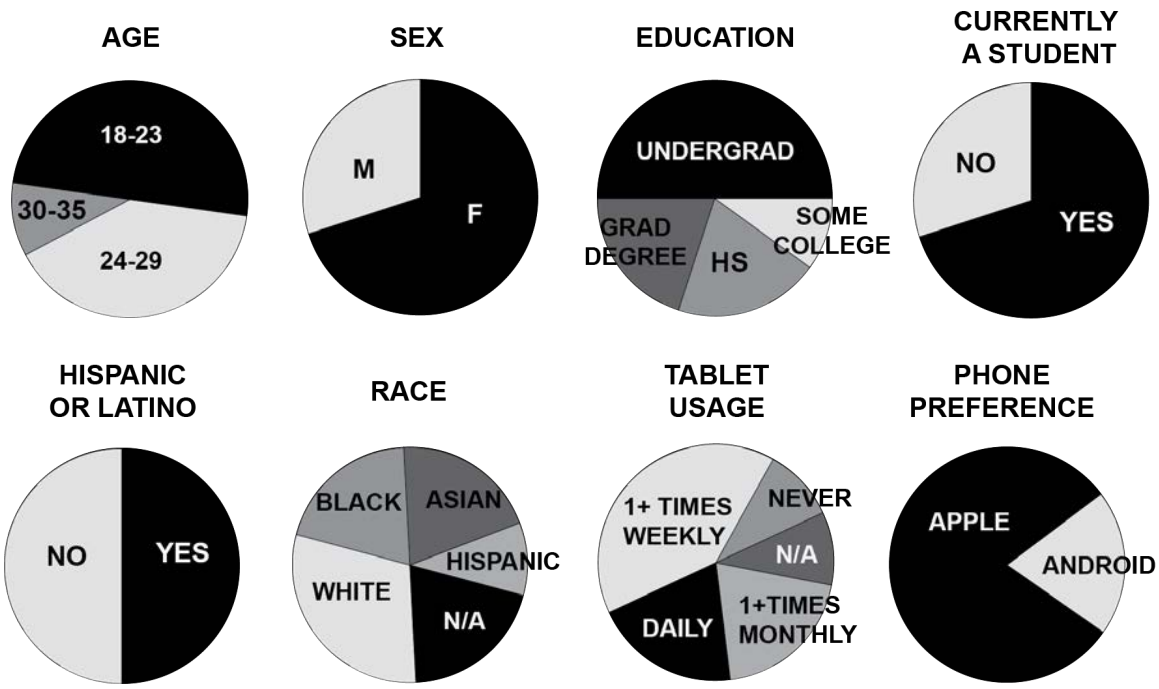


Chart 5. Participant data for paper-prototyping study.

While participants ranged in their experience designing interfaces, researchers grouped them based upon their interests and experiences using web and mobile products. Participants were asked to use scratch paper, sticky notes and other tools to design Fusion's "Miami at 100" for mobile users.

Researchers videorecorded the construction of paper prototypes by focusing on the participants' hands and prototypes only. Researchers asked questions about the design and the process during the exercise, which lasted about 45 minutes. Sessions ended with groups presenting their prototypes to each other and explaining their decisions. Discussions from the videos were transcribed for analysis, as were notes made about the construction of the prototypes captured on video.

What the Data Show

Researchers spoke nearly weekly from June 2015 through data collection, which ended in January 2016. Data were shared between members of the research team for discussion and interpretation. Major findings were recorded in a shared, cloud-based document to explicate intersections of meanings, which are presented below, along with tips for producers of this work.

Finding 1. Millennials Read to Learn.

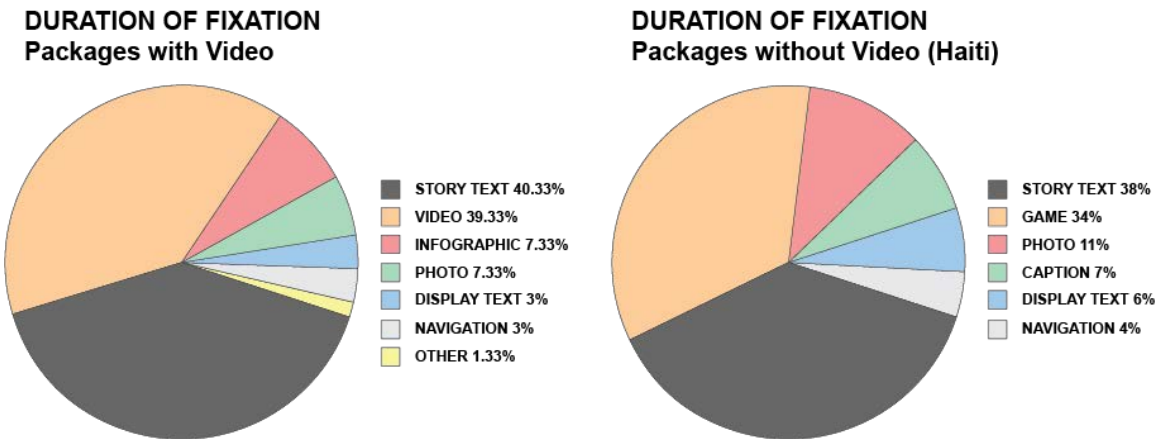


Chart 6. Duration of fixation on media elements.

Previous studies have found that Millennials are readers. Our study confirms that finding, and delves further into what they expect from reading. Cumulatively, in three out of the four projects tested in the eye tracking study, story text—text in the main story or sidebar stories—attracted the largest number of fixations from all participants. In one project (“T-Shirt”), video edged out text slightly. In two projects (“Firestorm” and “Haiti”), participants fixated longer on story text than on any other element. In the other two projects (“Meat Addiction” and “T-Shirt”), participants fixated longest on video, but they fixed on text for the second longest amount of time (Chart 6). Only one of the four projects (“Haiti”)

did not have video; it had an interactive game, which was also text but coded separately as “game.” In that presentation, story text garnered the most fixation time at 38 percent but the game was second at 34 percent.

In the entire eye tracking study, the percentage of total fixation time for all the participants that was spent on story text ranged from 52 percent (“Firestorm”) to 25 percent (“T-Shirt”). Readers of *The Guardian*’s “Firestorm” spent the longest amount of time fixating on text.

Write and visualize to enhance understanding. In post-eye tracking interviews, participants said that if they read the text, they did so to understand the story. “I guess I’m more interested in the facts than the other showy stuff,” one said. Overall, eye tracking participants said story text served a purpose of providing information and clarity on the subjects being covered in the story projects. As one participant in the eye tracking study said, through the text, “[i]t was kind of easy to get exactly what the author was trying to convey to you.”

Still, bigger-sized text, such as headlines and pullquotes (represented as “display text” in Chart 6), were deemed easier to read and more appealing than large blocks of smaller text. Participants reported liking text that was clear, brief, and effectively integrated with images and graphics. By “effectively integrated,” we mean that photographs, infographics, interactive games and other multimedia elements were not merely tacked onto the text. Those elements fit into the text both contextually and visually. The words and images complemented one another, and they appeared to be telling one story, with images adding additional informational (as with infographics) or emotional (as with photos and video) or experiential (as with games) dimensions to the text. As Berkeley journalism professor Jeremy Rue wrote of “Snow Fall,” “all of these components together create a more immersive experience for the viewer, like that found in traditional media like documentaries or long-form narratives” (Rue, 2013).

Several participants involved in paper prototyping suggested using bullet points and visuals to combat the physical limitations of reading on cellphones. One explained how they used visuals to express what the text said in the original

piece, making the information easier to consume on the cellphone. “I think we transformed the text into more visuals,” one participant said, and continued:

> So we tried to basically say what the text was saying, but in visual form. Because in our minds it was more like okay, this is a phone. People don’t really want to scroll through a bunch of text . . .if you put that entire story in a phone-type of scope, you’re going to be scrolling for a while. After a while, it just gets annoying. So we tried to display the text in visual form. Whether that was in our interactive timeline with the pop-ups, or the pictures, we tried to take different sections of our new created story. Instead of writing words, we tried to use visuals.

For those who had time and wanted to know more about particular elements of the project, designers added “external options,” such as links to outside sites or to other pages within the project. One group used large and colorful subheads because the information provided in the subheads alone could save users from an unwanted experience of beginning to read a section that might not interest them.

Maintain narrative flow. Participants in semi-structured individual interviews said they preferred stories where visual elements broke up longer passages of text. However, they did not want the visual elements to interfere with the flow of the narrative, and several skipped over opportunities to click on interactive elements or videos so they could continue reading. “I kind of wanted to read more of the article rather than clicking,” one participant said, “usually that’s my style. I read the full entire article and click on links later just so I won’t get lost.” Other participants expressed similar views: “My instinct was to go for the read and mess with everything else later,” another stated. “I don’t feel like going to another page,” a third explained when asked why they did not click on a link to an infographic.

Make mobile reading more enjoyable. In focus groups, participants found that reading longform projects on mobile devices differed from reading them on laptops. Specifically, reading tends to be more difficult and less enjoyable on the cellphone versus on the laptop. The cellphone is convenient in that it allows one to access the story from nearly anywhere, such as in bed or

while traveling. However, reading on the phone means the text needs to be bigger, which requires more bothersome scrolling.

One participant said that it was preferable interacting with “Meat Addiction” on the laptop rather than the cellphone, simply because the larger screen is “better for your eyes.” In a pinch, the participant said, one could use the cellphone in the right situation, such as traveling, but that the experience would be shorter and less enjoyable.

In the paper-prototyping study, one group focused on relaying as much information as possible with as little text as possible. Here is where some of the study’s findings become complex. Paper-prototyping participants, by and large, said that while they were interested in reading the longform projects, they simply did not want to create a text-heavy mobile project. In some cases, participants wished not to diminish the value of the written word, but had a hard time justifying placing “too much text” on “tiny screens.” Instead, participants desired—and designed—projects that would have snappy subheads, interactive games, and video.

Finding 2. Apps Add An Edge

With the tagline “There’s an app for that,” Apple ushered in the Age of the App with its iPhone 3G commercial in 2009. More recently, news organizations have started to develop more complex applications, integrating them within news stories. For example, the “How Y’all, Youse and You Guys Talk” language quiz was the most-viewed content on the *The New York Times* website in 2014. Interactive applications take time, specialized knowledge and money to produce. So when does it makes sense for news organizations to invest limited resources into creating applications? Our research suggests applications can add an edge to news stories, as long as the apps meet the users' expectations and serve their needs.

Maintain context. Semi-structured interview participants were more likely to interact with applications embedded directly within the layout of a news

page, rather than clicking on a button or a link that might take them to another page. Indeed, more than one participant completely missed a link to an application embedded within the story because it looked like an ad.

Some of our semi-structured interview participants expressed anxiety about being taken out of the context of the story they were reading. “I’m worried if I click that it will take me to a completely different topic,” one said. Others stated a preference for reading the text first, then exploring extras like news applications after reading: “My instinct was to go for the read and mess with everything else later.” This is a useful data point for news organizations creating Web-integrated applications, but perhaps not as relevant for native applications on cellphones, where the size of the screen may limit the ability to embed or layer related content.

Present a solution or a call to action. Our semi-structured interview participants said they enjoyed stories that presented difficult issues or social problems, but they expected the story to provide possible solutions or at least a call to action to address the issues and problems raised in the story, bringing to mind organizations like Solutions Journalism Network that help reporters cover difficult stories with an eye toward solving problems. “To a Millennial you think about, alright it’s a problem. What can we do about it? Is there anything I can do,” one of our participants said. They were disappointed when these elements were absent, most notably in “Haiti,” which, as one person said, presented “a game I cannot win.”

Be credible. Some good news for mainstream media organizations: Our semi-structured interview participants viewed the credibility of established news sources favorably and questioned the credentials of lesser-known entities. They also noted where news organizations failed to cite sources and felt that detracted from the credibility of the work. Our participants wanted both first-person accounts of how the stories impacted individuals, as well as easily readable statistics to back up the stories.

Make mobile interactive. Participants in all studies thought interactivity was a positive feature of mobile longform journalism. Although

"interactivity" is a somewhat vague term, "interactive" features mentioned by our participants included entering text, clicking, tapping, swiping, and scrolling. Cellphones may extend the notion of interactivity beyond the capability of projects designed for laptops: When building the mobile version of a longform article, one group in the paper prototyping study utilized the rotation and motion capabilities of phone to guide viewers interested in accessing video.

Electronic games also contribute to the repertoire of interactivity in online news. In the eye tracking study, six of seven participants who interacted with the "Choose Your Own Adventure"-game in "Haiti" said that they enjoyed it: "The game had purpose," one person said, "like it wasn't just a game for game's sake. There was information there I was getting by playing the game."

By and large, participants in all studies said that technical glitches make interactive features less engaging. After reading "Haiti" on their cellphone, for example, one participant said that, because the interactive feature was not working properly the project was less enjoyable than it appeared on the laptop. In the end, this lessened the amount of time the participant stayed on the project on the cellphone: "I like the laptop better," that participant said, "because on the phone when it does the interactive-like choose how to rebuild Haiti, it would cut off what your choices were" to interact with creating solutions for the nation following a devastating earthquake.

Finding 3. Subject Matter Matters.

Participants in focus groups, eye-tracking, and semi-structured interviews said they were most likely to read and share longform projects if they found the topic to be relevant to their lives, interests, and geographies. For example, in the semi-structured interviews, two participants found "Losing Ground," the story about coastal Louisiana, to be particularly engaging, but said that they would not share this project because it's not about a location with which they are familiar. On the other hand, several participants were current or recent college students, and said that they would share the "College Debt" story because it was relevant

to them and their friends. “People tend to be more interested in articles that are directly impacting them right now,” one participant said. “I would definitely share [“College Debt”],” said another, “because I know a lot of people that are going through this or something similar to debt during school.”

Make stories personally relevant. While participants in the eye tracking study spent the longest amount of time fixating on the text of “Firestorm,” the most literary of the four projects studied, the quality of the longform projects’ writing cannot make up for a lack of interest in the subject matter. When speaking about “Firestorm,” one focus group participant said that the story about a Tasmanian bushfire would likely not be of much interest to audiences in South Florida.

The relevance of a longform project’s topic added to the users’ enjoyment of the project—and their interest in sharing it. Participants in the eye tracking study, for instance, said of the 30 projects that they viewed, they would likely share 14 through social media, by email, or by word of mouth. Relevance to the participant’s life or an interest in the topic (sometimes both) was the reason for sharing 11 of the 14 projects. If a project was not deemed relevant or interesting to the participant and/or the participant’s social media contacts, it was seen as unworthy of being shared.

Furthermore, relevance of the project’s topic was portrayed as something personal; the story needed to be relevant to the reader herself, not society as a whole. When describing one’s experience with “Haiti,” for instance, a focus group participant explained how being personally interested in the topic added to the enjoyment of the project. And while relevance is a somewhat broad and subjective concept, participants in paper prototyping and in focus groups hinted at what elements can influence relevance, including geography of the story itself. Consuming media on the cellphone versus the laptop did not, for the most part, effect relevance for participants involved in focus groups.

Make parts of the project easily shareable. Eye tracking participants sometimes singled out specific components of a longform story, such as an infographic, and expressed an interest in sharing just that. Two of the

participants in that study said they would share even a project with a subject that didn't interest them because of the innovative, interactive design.

In one focus group, one participant said that the subject matter of "Haiti" would be worthy of being shared with others, in part because some of the interactivity provides the user with a sense of "power" to "make decisions" related to rebuilding the nation's infrastructure. "Even though you won't make a difference directly" by playing the game, "you're at least giving these people, who created the game or the project, some information" by sharing the choices one would make via the game. "It's power that we have."

Finding 4. More Time on Text and Video, but More Praise for Photographs and Infographics.

In the eye-tracking study, video was either first or second in the number and duration of fixations in each longform project with video. In post-session interviews, however, participants had the most praise for photographs over all other elements. In three of the four projects studied, participants identified infographics as their favorite element.

Make videos short, informative, and relevant. Although participants in the eye-tracking study spent so much time fixating on video, they didn't all enjoy the videos they watched. Out of the 11 participants who interacted with "Meat Addiction," three said they did not like the nearly seven-minute video, because it was "too long." Said the same participant, "I watched the video, but I got bored." The videos participants liked best were short (less than three minutes long) and relayed information that helped the participant understand the topic. Participants said they enjoyed the videos in both "T-Shirt" and "Firestorm" for these reasons. Out of 23 sessions with video, participants said they liked video best in eight of them.

Include photographs that add to the users' experience of the story. Photographs provide a break for the eye when scrolling, participants in eye tracking and paper prototyping studies said. Unlike large sections of text that are part of the main story ("story text"), which participants in the eye tracking study said were sometimes overwhelming, not one eye tracking participant expressed frustration at seeing a photograph appear mid-scroll. Overall, eye tracking participants liked when photographs provided emotional or informational material, such as the images of the Holmes children clinging to the dock in "Firestorm" and documentary-style photography in "Haiti." Those photographs complemented the story text by providing pictures that deepened the experience of reading the story. One participant said even the atmospheric photographs that did not contain people (or emotion) in "Firestorm" worked because of the way

they appeared as the user scrolled down the page. “[The photos] were explaining what this home looked like,” the participant said,” and they had the home in the background, and you kind of got a better image of what you were reading when you were looking at that as well.”

Don’t overwhelm with infographics. Infographics can relay information clearly and fast—or they can overwhelm with too many images, design elements, and data. In “T-Shirt,” eye tracking participants said that they enjoyed the variety and simplicity of the infographics, including a chart that relayed minimum wage information around the world and a photographic infographic of how cotton becomes yarn. “Even if you didn’t read the entire article and all you scrolled to was this chart,” one participant said, “you would understand what the point of it was. You would easily see in two seconds what this author was saying.”

Finding 5. The Future Is (Even More) Visual.

Millennials who designed their own longform projects on cellphones as part of paper prototyping reduced the amount of text that appeared in their redesign by three-fourths and increased the use of infographics, video, and interactive images. Going forward, they said, the genre of longform journalism on mobile devices should be (even more) visual.

Make visuals meaningful. Visual elements, such as photos, infographics, timelines, video, and games have the potential to immerse users into geographies other than their own. Data become tangible. Stories become personal. One focus group participant, while describing “Firestorm” as viewed on the cellphone explained how visuals can make a story “real” in ways that text may not. As a result, the project also becomes more relevant. “It’s like the story is in front of you, not a recreation of it,” the participant said. “It makes it more real, like you’re there, versus someone just recounting the events.” The participant continued, “If you are looking at it as it’s happening, you’re looking at the shots

and the fire, you can put yourself in their position more than just reading a story and not having that idea of what they experienced."

Visuals also attract readers to longform projects, participants in all four studies suggested, allowing users to become aware of the project, choose to interact with it, and decide on their own how much time they will spend with it. As one eye-tracking participant said, "Visual is always better at catching people's attention. … I can look for two minutes, get the idea and move on."

Diminish distractions. Participants in focus groups, who interacted with longform projects first on laptops and then on cellphones, spoke about distractions that interfered with their ability to read the articles while on cellphones. Distractions while participants viewed projects on cellphones included movement within the study location, the volume of the audio within the projects, and the integration of ambient sound with some projects.

Functional purposes of the cellphone, such as texting, notifications, and calls— even when participants were asked to silence phones or turn off notifications—were sources of distraction. Distractions while participants interacted with projects on laptops were based on the design of the story, such as page backgrounds that held moving images or videos that played when users were not expecting it. Even so, participants frequently moved back and forth between cellphones and viewing the content on laptops, even when asked to refrain from using their cellphones during the session.

Conclusion

Like the traits of Millennials themselves, some of our findings seem contradictory: Millennials are "me-first" but altruistic, confident but worried about their futures, and collaborative but not loyal (Vogel, 2015). Our study showed that members of the Millennial generation do read longform journalism on tablets, cellphones, and laptops, but they often prefer their information in visual packages.

Millennials want to read in order to understand stories that appeal to them personally, but they feel watching a video or viewing a photograph or infographic would all be quicker ways to learn what the journalists want to tell them. They like apps but they won't take a chance on them if the content doesn't grab their attention immediately. They want to learn about the subjects that interest them, but they are easily distracted, especially while interacting with such work on their cellphones. Yet, interest is not always required to draw in this audience. One participant in the prototyping group who was not particularly interested in that topic said it offered users "something to do" on the phone, suggesting that, sometimes, an invitation to interact with something is all that is needed to motivate someone to read a story.

All four studies suggest that research into other audience characteristics besides age are needed. Beliefs, attitudes, and cultural expectations all affect how and why Millennials interact with this work. If digital longform journalism has a future with this generation, it will have to adapt to their expectations and needs. The "long" matters much less than the "form." This work should be relevant, visual, interesting, personal, usable, credible, and fully interactive on the cellphone. News organizations that can produce this kind of digital work will benefit. Members of this generation will share, praise, and interact with the stories that appeal to them. It doesn't matter how many words it has.

Elements of Effective Digital Longform Journalism

Text is clear and informative.

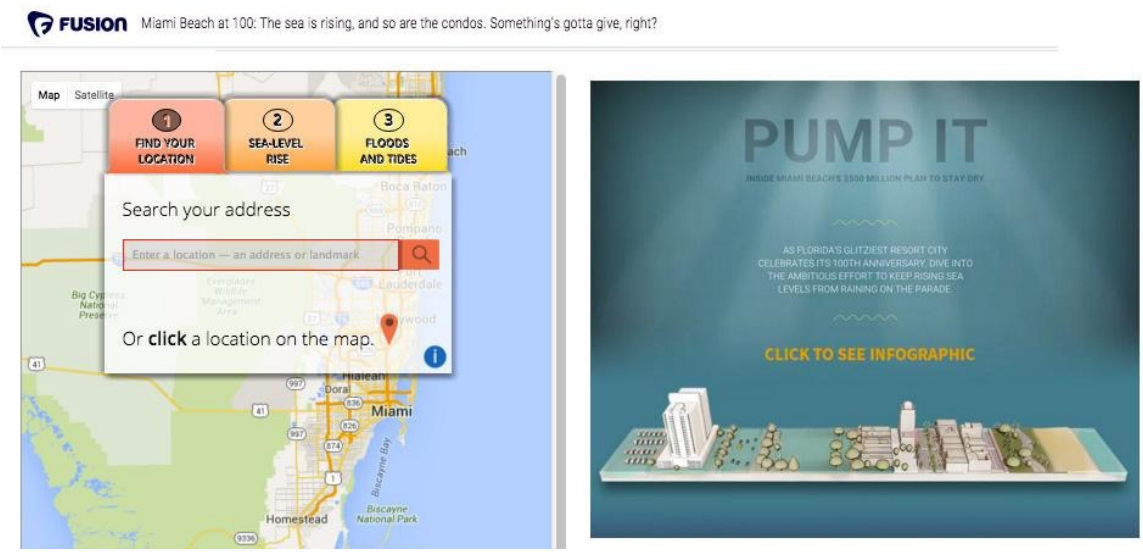
Millennials read what interests them; Eleven of the 15 participants in the eye-tracking study were interested in reading about cultured beef. Although the text was long, participants appreciated the direct, informative nature of the writing in The Verge's "Your Meat Addiction is Destroying the Planet (But We Can Fix It)." Here's an example:

"A growing consensus among scientists, doctors, environmentalists, and animal rights activists suggest that our current system of food — specifically meat — production is not sustainable. By 2050, the global demand for meat will double as our population continues to rapidly grow. The effects of all this farming on our environment are currently devastating, and getting worse. Simply put, we are destroying the planet, and meat production and consumption is arguably the most to blame."

Large text is also attractive to scrolling readers because it catches their eye, as this nontraditional treatment of a pullquote-type caption does in "Rebuilding Haiti."

Stories about difficult social problems include information about potential solutions or actions that readers can take to further their understanding or help create a solution.

Infographics and an interactive sea level rise viewer helped our participants better understand sea level rise in South Florida, and what the City of Miami Beach was doing about it in Fusion's Miami Beach at 100: The Sea Is Rising and So Are the Condos. For more examples, check the Solutions Journalism Network Web site.

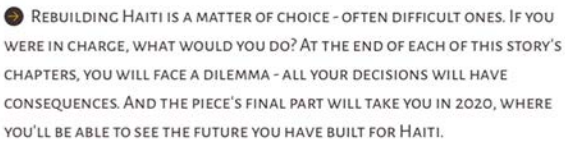


Lengthy text is broken up with visual elements.

Infographics, photographs, and video often appear in between paragraphs in National Public Radio's "Planet Money Makes a T-Shirt," allowing for the user to take in more information visually.

Videos and interactive elements are embedded within the story page, or are easily accessible when readers feel like engaging with links, maps, videos, or other content that will take them away from the main story text.

In "Rebuilding Haiti," the game appears as the user scrolls. It is easy to see and interact with; however, the user will not be able to read the story without interacting with the game. There is no ability to skip past it. While readers do appreciate high visibility and ease of using such interactive features, they do not want to feel trapped by them.

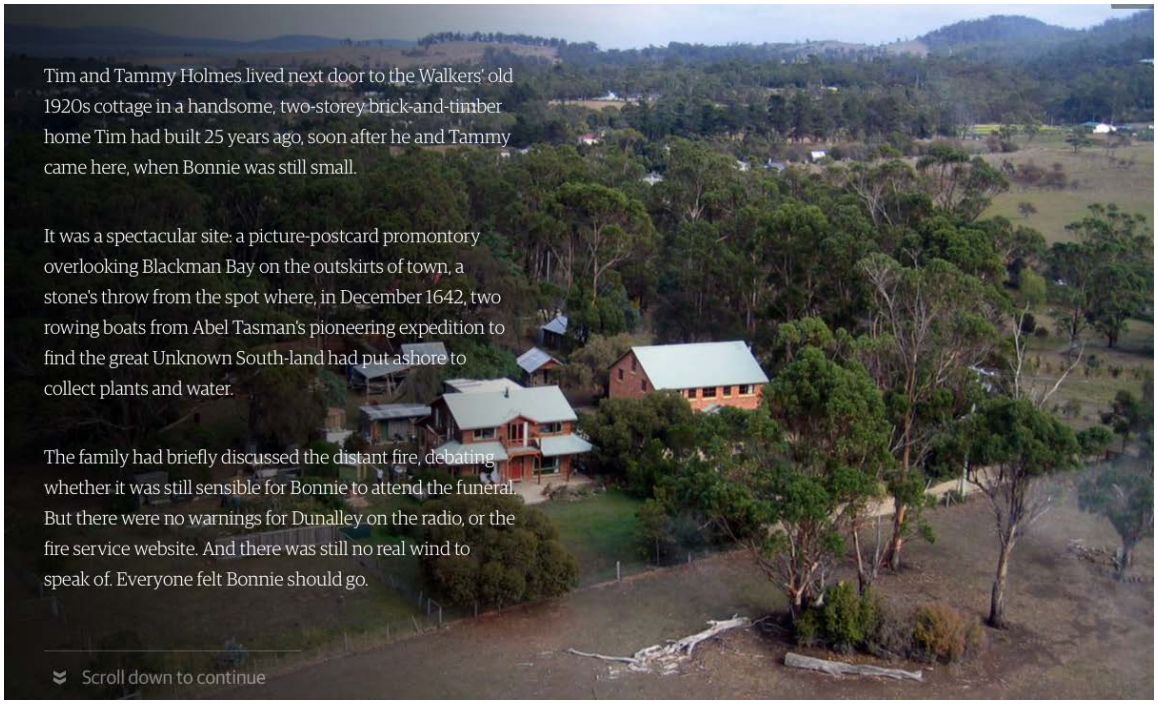


Elements complement one another, with the multimedia ones adding an informational, emotional or experiential dimension to the text.

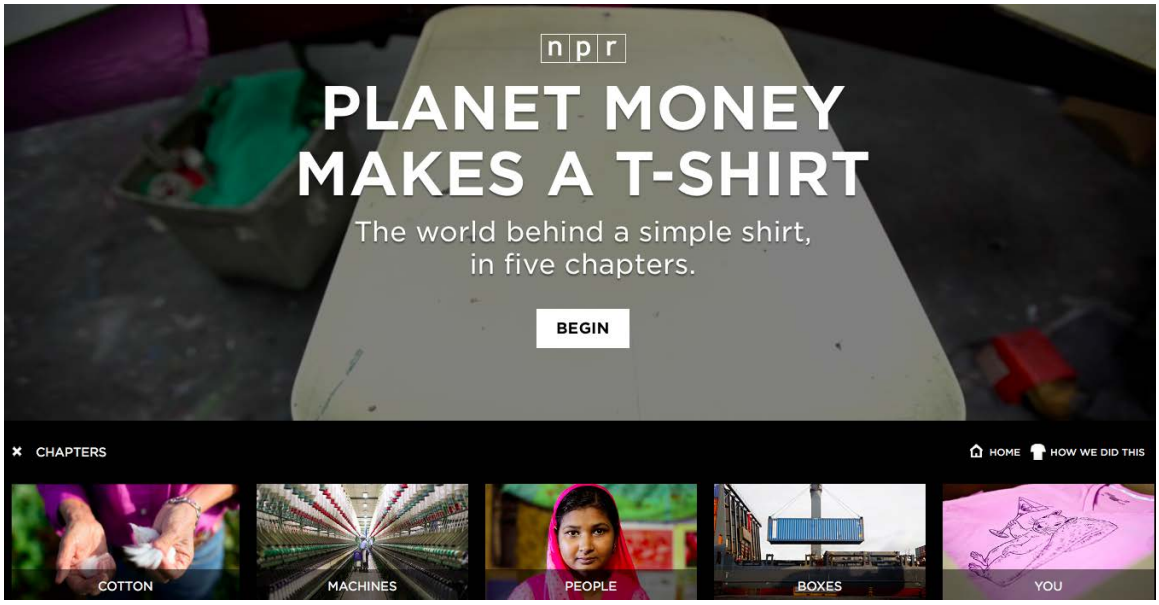
Words can prepare users for a multimedia experience that can inform or enthrall them. In this instance from The Guardian's "Firestorm," for instance, the author's words explain the context needed to understand the unforgettable image of the Holmes children holding onto a jetty during a Tasmanian bushfire.

> “So Tim lifted his wife’s phone, stepped back a couple of meters, and took these pictures. Straightaway he sent a couple—Tammy and the kids huddled in the water, clinging to the jetty; Polly the springer spaniel weaving about above them; a mesmerizing, terrifying wall of flame behind—to Bonnie, with a brief message: we’re alive.”

As the user scrolls in “Firestorm,” even atmospheric photographs are enlightening because they add to the text that appears on the left side of the page.



National Public Radio’s “Planet Money Makes a T-Shirt” begins each chapter with a video. The narrative begins underneath, followed by photographs, infographics and sidebars that offer the user a multidimensional experience. The one-word chapters (Cotton, Machines, Boxes, etc.) do not seem interesting on their own, but are made much more fascinating in the context of the story. These are essential topics for those wanting to learn what it takes to make a t-shirt and sell it in America.


npr
PLANET MONEY MAKES A T-SHIRT
The world behind a simple shirt, in five chapters.
BEGIN
CHAPTERS
HOME
HOW WE DID THIS
COTTON
MACHINES
PEOPLE
BOXES
YOU

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References

Adam, P. Stark, Quinn, S. & Edmonds, R. (2007). *Eye tracking the News: A Study of Print and Online Reading*. St. Petersburg, FL.: The Poynter Institute.

Ahmad, M. (2014) Understanding hypertextual modalities using meaning making strategies. *Journal of Critical Inquiry*, 12(1), 41-64.

Aikat, D. D. (2014). Imagine an app for that: Using science fiction prototypes to conceptualize media tools. *Global Media Journal-Indian Edition,* 5(1), 1-18.

American Press Institute. (2015). Breaking down the Millennial generation: A typology of Millennial news consumers. https://www.americanpressinstitute.org/publications/reports/survey-research/millennials-typology/

Anderson, M. (2015). Technology device ownership. Pew Research Center. Retrieved at http://www.pewinternet.org/2015/10/29/technology-device-ownership-2015/#fnref-14935-1

Andrews, C., Burleson, D., Dunks, K., Elmore, K., Lambert, C. S., Oppegaard, B., Pohland, E., Saad, D., Scharer, J. S., Wery, R. L., Wesley, M., & Zobel, G. (2012). A new method in user-centered design: Collaborative prototype design process (CPDP). *Journal of Technical Writing and Communication,* 42(2), 123-142.

Baier, R. R., Cooper, E., Wysocki, A., & Gravenstein, S. (2015). Using qualitative methods to create a home health web application user interface for patients with low computer proficiency. eGEMs (Generating Evidence & Methods to improve patient outcomes), 3(2).

Barnhurst, K. G. (2012). The form of online news in the mainstream US press, 2001-2010. *Journalism Studies,* 13(5-6), 791-800.

Barnum, C. M. (2011). *Usability Testing and Research*. New York, NY: Morgan Kaufmann.

Bennet, J. (2013, 12 December). Against 'long-form' journalism. The Atlantic, 12 December. http:// www.theatlantic.com/business/archive/2013/12/against-long-form-journalism/282256/

Benton, J. (2014). The mobile majority. *Nieman Reports,* Spring, 38-39.

Buddenbaum, J. & Novak, K. (2001). *Applied Communication Techniques*. Ames, IA: Iowa State University Press.

Chyi, H. I. & Chadha, M. (2012). News on new devices: Is multi-platform news consumption a reality? *Journalism Practice,* 6(4), 431-449.

Dowling, D. & Vogan, T. (2015). Can we 'Snowfall' this? Digital longform and the race for the tablet market. *Digital Journalism*, 3(2), 209-224.

Eveland, W. & Dunwoody, S. (2000). Examining information processing on the World Wide Web using think aloud protocols. *Media Psychology,* 2(3), 219-244.

Fisher, T. (2015, November 19). Do visual stories make people care? National Public Radio. http://blog.apps.npr.org/2015/11/19/sequential-visual-stories.html

Fry, R. (2015). Millennials surpass Gen Xers as the largest generation in U.S. labor force. Pew Research Center, Retrieved at http://www.pewresearch.org/fact-tank/2015/05/11/millennials-surpass-gen-xers-as-the-largest-generation-in-u-s-labor-force.

Halpern, M. & Humphreys, L. (2014). Iphoneography as emergent art world. *New Media & Society,* 18(1)*,* 62-81.

Hiippala, T. (2016). The multimodality of digital longform journalism. *Digital Journalism.* doi: 10.1080/21670811.2016.1169197

Holsanova, J., Rahm, H. & Holmqvist, K. (2006). Entry points and reading paths on newspaper spreads: comparing a semiotic analysis with eye-tracking measurements. *Visual Communication*. 5 (65), 73. Retrieved from http://www.lucs.lu.se/Jana.Holsanova/PDF/Holsanova%20et%20al.2006.pdf

Jacobson, S., Marino, J., & Gutsche, R. E. (2016). The digital animation of literary journalism. *Journalism*, 17(4), 527-546.

Jameson, D. (2013). New options for usability testing projects in business communication courses. *Business Communication Quarterly*, 76(4), 397-411.

Johnson, B. (2013, July 16). Snowfallen. *Medium.com*. https://medium.com/inside-matter/66b9060333ad.

Lindlof, T. R. & Taylor, B. C. (2011). *Qualitative Communication Research Methods.* Thousand Oaks, CA: Sage.

Manjoo, F. (2013). A whole lot of bells, way too many whistles, *Slate*. http://www.slate.com/articles/technology/technology/2013/08/snow_fall_the_jockey_the_scourge_of_the_new_york_times_bell_and_whistle.html

Mitchell, A., Stocking, G., & Matsa, K. E. (2016). Long-form reading shows sign of life in our mobile news world. Pew Research Center, May. http://www.journalism.org/2016/05/05/long-form-reading-shows-signs-of-life-in-our-mobile-news-world.

Nielsen, J & Pernice, K. (2009). What is eyetracking research? Nielsen Norman Group.com. https://www.nngroup.com/books/eyetracking-web-usability/

Ritchie, J. & Lewis, J. (2003). *Qualitative Research Practice*. London: Sage.

Romenesko, J. (2012). More than 3.5 million page views for New York Times' "Snow Fall" Feature. Romenesko.com. http://jimromenesko.com/2012/12/27/more-than-3-5-million-page-views-for-nyts-snow-fall/.

Rue, J. (2013). The 'Snow Fall' effect and dissecting the multimedia longform narrative. Multimediashooter.com. http://multimediashooter.com/wp/2013/04/21/the-snow-fall-effect-and-dissecting-the-multimedia-longform-narrative/

Salvucci, D. D. & Goldberg, J. H. (2000). Identifying fixations and saccades in eye-tracking protocols, In *Proceedings of the Eye Tracking Research and Applications Symposium* (p. 71-72). New York: ACM Press.

Snyder, C. (2003). *Paper Prototyping: The Fast and Easy Way to Design and Redefine User Interfaces.* San Francisco, CA: Morgan Kaufmann Publishers.

Stanton, D. (2013). *Discriminating news-reading behavior and cognition using eye-tracking methodologies*. (Doctoral dissertation, University of Florida). http://ufdcimages.uflib.ufl.edu/UF/E0/04/63/23/00001/STANTON_D.pdf

Taipale, S. & Fortunati, L. (2014). Capturing methodological trends in mobile communication studies. *Information, Communication & Society,* 17(5), 627-642.

Vogel, P. (2015). *Generation Jobless?: Turning the Youth Unemployment Crisis into Opportunity*. New York, NY: Palgrave Macmillan.

Westlund, O. (2013). Mobile news: A review and model of journalism in an age of mobile media. *Digital Journalism,* 1(1), 6-26.

Wimmer, R. & Dominick, J. (2000). *Mass Media Research: An Introduction*. Belmont, CA: Wadsworth.

Work Related to This Study

Gutsche, Jr., R. E., Marino, J., & Jacobson, S. (2016). Cracking the code: Can long-form multimedia news attract – and keep – audiences? Journalism Interactive 2016, University of Florida, Gainesville, Florida, February 26-27.

Gutsche, Jr., R. E., Jacobson, S., & Marino, J. (2015, December 10). Classrooms as homes for creative, engaged research. MediaShift.org. http://mediashift.org/2015/12/classrooms-as-homes-for-creative-engaged-research.

Gutsche, Jr., R. E., Jacobson, S., & Marino, J. (2015, October 28). Can long-form journalism thrive in the age of the mobile device? RjiOnline.org, http://www.rjionline.org/blog/can-long-form-journalism-thrive-age-mobile-device.

Jacobson, S., Gutsche, Jr., R. E., & Marino, J. (2016, January 28). 3 lessons learned – so far – from studying interactive elements in long-form multimedia news stories. RjiOnline.org. https://www.rjionline.org/stories/3-lessons-learned-so-far-from-studying-interactive-elements-in-long-form-mu.

Jacobson, S., Marino, J., & Gutsche, R.E. (2016) The digital animation of literary journalism. *Journalism*, 17(4), 527-546.

Jacobson, S., Marino, J., & Gutsche, Jr., R. E. (2016). Should there be an app for that?: An analysis of interactive applications within longform news stories. Accepted for presentation at the Newspaper and Online News Division, Association for Education in Journalism and Mass Communication, Minneapolis, Minnesota, August 4-7.

Marino, J., Jacobson, S., & Gutsche, Jr., R. E. (2016). Read, watch or tap? Eye tracking long-form journalism on mobile devices. International Association for Literary Journalism Studies, Eleventh International Conference for Literary Journalism Studies, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre – Rio Grande do Sul, Brasil, May 19-21.

Marino, J., Gutsche, Jr., R. E., & Jacobson, S. (2016). Groundbreaking storytelling or dancing hamsters? What eye tracking tells us about the future of digital longform journalism. Accepted for presentation at the Newspaper and Online News Division, Association for Education in Journalism and Mass Communication, Minneapolis, Minnesota, August 4-7.

Marino, J., Gutsche, Jr., R. E., & Jacobson, S. (2016). Literary journalism: Exploring the genre. Panel for the International Association for Literary Journalism Studies, Association for Education in Journalism and Mass Communication, Minneapolis, Minnesota, August 4-7.

Marino, J., Jacobson, S., & Gutsche, Jr., R. E. (2015, October 1). The eyes have it: Using eyetracking to examine reader engagement. RjiOnline.org. Retrieved at http://www.rjionline.org/news/eyes-have-it.

Appendix A - Detailed participant data tables

Eye Tracking (15 participants)													
Age		**Sex**		**Education**		**Current Student**		**Hispanic or Latino**		**Race**		**Tablet Usage**	
18-23	10	**F**	7	**High School**	3	**Yes**	10	**Yes**	0	**Asian**	2	**Daily**	3
24-29	4	**M**	8	**< 2 years of college**	5	**No**	5	**No**	15	**Black**	1	**Several times per week**	2
30-35	1			**Undergrad**	7					**White**	12	**Weekly**	4
												Monthly or less	6

Semi-structured interviews (18 participants)													
Age		**Sex**		**Education**		**Current Student**		**Hispanic or Latino**		**Race**		**Tablet Usage**	
18-23	8	**F**	10	**High School**	8	**Yes**	7	**Yes**	12	**Black**	2	**Daily**	1
24-29	6	**M**	8	**< 2 years of college**	1	**No**	11	**No**	6	**White**	14	**Several times per week**	1
30-35	4			**Undergrad**	8					**Other**	2	**Weekly**	16
				Master's	1								

Focus Groups (10 participants)													
Age		**Sex**		**Education**		**Current Student**		**Hispanic or Latino**		**Race**		**Tablet Usage**		**Phone Preference**	
18-23	5	**F**	7	**High School**	1	**Yes**	7	**Yes**	4	**Black**	0	**Daily**	1	**Apple**	8

24-29	4	**M**	3	**Undergrad**	4	**No**	3	**No**	6	**White**	7	**Weekly**	2	**Android**	2
30-35	0			**Master's**	5					**Other**	2	**Several times per month**	1		
N/A	1									**N/A**	1	**Monthly or less**	6		

Paper Prototyping (10 participants)															
Age		**Sex**		**Education**		**Current Student**		**Hispanic or Latino**		**Race**		**Tablet Usage**		**Phone Preference**	
18-23	5	**F**	7	**High School**	2	**Yes**	7	**Yes**	5	**Asian**	2	**Daily**	2	**Apple**	8
24-29	4	**M**	3	**> 2 Years of College**	1	**No**	3	**No**	5	**Black**	2	**Several times per week**	4	**Android**	2
30-35	1			**Undergrad**	5					**White**	3	**Several times per month**	1		
				Master's	1					**Other**	1	**Monthly or less**	2		
				Terminal Degree	1					**N/A**	2	**N/A**	1		

Total (53 participants)															
Age		**Sex**		**Education**		**Current Student**		**Hispanic or Latino**		**Race**		**Tablet Usage**		**Phone Preference (N=20)**	
18-23	28 (52.8%)	**F**	31 (58.5%)	**High School**	14 (26.4%)	**Yes**	31 (58.5%)	**Yes**	21 (39.6%)	**Asian**	4 (7.5%)	**Daily**	7 (13.2%)	**Apple**	16
24-29	18 (34%)	**M**	22 (41.5%)	**Less than 2 years of College**	7 (13.2%)	**No**	22 (41.5%)	**No**	32 (60.3%)	**Black**	5 (9.4%)	**Several times per week**	7 (13.2%)	**Android**	4
30-35	6 (11.3%)			**Undergrad**	24 (45.2%)					**White**	36 (67.9%)	**Weekly**	22 (41.5%)		

N/A	1 (1.8%)			**Master's**	7 (13.2 %)					**Oth er**	5 (9.4 %)	**Severa l times per month**	2 (3.8%)		
				Terminal Degree	1 (1.8 %)					**N/A**	3 (5.6 %)	**Monthl y or less**	14 (26.4 %)		
												N/A	1 (1.8%)		

Appendix B

The codebook for the eye tracking study consisted of the following elements:

- Caption – Descriptions of photographs, illustrations or videos that appear near or on top of the visual element being described.
- Credits – A list of authors, designers and other contributors to the story, usually listed at the end of the project or in the about-this-project tab.
- Game – A web application that is built into the story project.
- Display Text – Any text larger than the story text, including headlines, pull-quotes and subheads.
- Illustration – A drawing.
- Infographic – Information represented in graphic form that may be static, animated, or interactive.
- Link – A word or group of words that connects to another page inside or outside of the story being viewed.
- Navigation – Any button, wording or menu that helps the user move to another part of the project. This does not include actual links.
- Photo – A static image that can appear anywhere in the project
- Story Text – Text that is part of the main story or a sidebar story. Bylines, headlines, subheads, captions and other text are not included.
- Video – A recorded, quickly moving sequence of images.