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INTRODUCTION

A 2017 Pew survey measuring news consumption in the U.S. found about 70% of Americans were interested in news about health and medicine. This level of interest, however, does not always translate into higher levels of news consumption overall. That is because on average, only 17% of users actively seek health news (Funk, Gottfried, & Mitchell, 2017). This gap suggests that while news consumers may express an interest in health news, fewer actively search for health news. Arguably, users exposed to health news online may or may not engage with it depending on how many headlines are presented.

Dor (2003) suggested that headlines play the role of a "textual negotiator" between a news story and its readers because every headline invites readers to select and read specific stories. This negotiator role for headlines offers new reasons to empirically explore whether certain headline characteristics might entice more readers to select and read the related health stories. In that context, this study proposes that a headline is a vantage point to engage more readers with more health news.

Specifically, this study examines the effects of varying amounts of key information presented in health news headlines. News media vying for readers' attention in digital spaces have increasing competition from countless sources. Consequently, many organizations are applying various production techniques with the hope to engage more readers. These techniques include varying the information presented in headlines. Previous research found that some U.S. news media have been producing more "explanatory headlines" (Boland, 2017). Applying on that strategy, the goal of this experimental study is to investigate if varying amounts of headline information could be the primary reason that significantly more users select corresponding health stories.

Heath information is the focus because health news is an increasingly important yet often complex news domain that affects individuals of all demographics. Another reason for focusing on health news is that some consumers are exposed to confusing or misleading health news online. Previous research found that misleading health-related information can garner more attention than evidence-based reports (Forster, 2017; Raphael, 2019). This can be more problematic when the general public encounters news online and takes action without confirming the source of the information (Shapiro, 2018). In this context, it would be beneficial to increase the public's engagement with accurate and informative health news.

Informativeness in headlines

Traditionally, the field of journalism often defined the formula for important information as "the five Ws" or who, what, when, where and why plus how. Accordingly, this study employs the five Ws formula to define the level of headline "informativeness." Specifically, headline informativeness is represented by two categories. Highly informative headlines include three or more of the five Ws plus how. Conversely, low informative headlines contain no more than two of the five Ws plus how. Based on that explication, this study asks,

RQ1: *Does the level of information in health news headlines significantly affect user selection?*

Headline research by Dor (2003), Geer and Kahn (1993), and Ifantidou (2009) examined the role of headlines but did not test the effects of varying amounts of information. Other research, such as Growney and Hess (2019) found that positive and negative health news can affect the moods of younger and older adults. Lopez, Prince, and Roche (2014) also examined the uses of nouns in headlines to provide cues of informativeness. The researchers proposed

guidelines to generate enticing headlines without the loss of informativeness. Although these studies addressed informativeness in news articles, their designs differ from the present study.

One difference is that the theoretical foundation of this study posits that user attention to many headlines is often the result of incidental exposure. Theoretically, scholars explained incidental exposure to online content such as headlines occur without a user's prior intention (Tewksbury, Weaver, & Maddex, 2001; Lee, 2009; Nguyen, 2008).

CONCEPTUALIZATION

Incidental exposure

Since the early research of incidental exposure by Downs (1957), the theory has become more applicable to online journalism. Downs conceptualized incidental exposure as a by-product of individuals' non-political activities and more recent studies argued that incidental exposure to online content does not cost other efforts to seek and find information (Yadamsuren & Erdelez, 2010). The notion of incidental exposure suggests that there is a potential for an online user to encounter unexpected content as they browse or scan content (Tewksbury, Weaver, & Maddex, 2001).

Prior to the advent of the internet, journalism scholars often applied incidental exposure to content in print and broadcast media. Specifically, Zukin and Snyder (1984) researched the passive learning by news consumers from information in newspapers and on television. Baum (2002) examined the incidental exposure to foreign affairs content on television.

The rapid rise of users on the World Wide Web in the mid-1990s, and later on social media, has prompted the efforts for some scholars to investigate the effects of incidental exposure to digital information. Since social media also make it easier for users to be exposed to

varied online news, researchers have examined user interest related to the incidental exposure to news on social media (Boczkowski et al., 2017; Fletcher and Nielsen, 2018; Valeriani and Vaccari, 2016). Others examined the interplay between incidental exposure to news with user variables such as age, gender, and technology used (Tewksbury et al., 2001, Lee, 2009; Mitchell et al., 2017).

Social media can also produce incidental exposure to news as users share and discuss news content with others. This sharing includes links to digital-only news media, which are often displayed as just "previews" with only headlines, text snippets and multimedia. Shared content is instantly and incidentally exposed to recipients even if they do not click a related link for more information (Fletcher & Nielsen, 2018).

Other scholars examined the benefits to users incidentally exposed to news. Yadamsuren and Erdelez (2010) argued that incidental exposure to news has become a way for many users to be informed about current events. The study also found a significant positive correlation between incidental exposure to news and user engagement with that information.

Fletcher and Nielsen (2018) noted that exposure to news on social media is a by-product of the constant use of social media on smartphones. The study also found that regular social media users incidentally exposed to news depend on significantly more sources for information than those who do not regularly use social media (Fletcher & Nielsen, 2018). In summary, there is ample evidence of the effects of incidental exposure to digital information. This study seeks to expand the literature by focusing on the effects of incidental exposure to health news and whether there are primary reasons why headlines with either high or low informativeness are – or are not - selected. The second research question is:

RQ2: *Are there primary reasons for users' selection of informative versus less informative health news headlines?*

In addition to identifying any significant reasons why certain headlines are selected, this study also explores possible relationships between user selection and interactivity (i.e. sharing, liking, commenting) with headlines that vary with the amount of information.

Interactivity

The importance of user interactivity with online news content continues to increase. Prior to the digital technology that instantly connects us, traditional audiences were considered more passive, or simply receiving one-way messages from a limited number of newspapers, radio and television stations. This process was often conceptualized as "the magic bullet" or "inoculation" of media. The debate about passive versus active audiences evolved since the 1950s, however, when the early media researchers Elihu Katz, Jay Blumer, and Denis McQuail challenged the presumed power and the effects of mass media by proposing new research recognizing that news consumers actively make their own choices. This approach was built upon Herta Herzog's (1941) early paradigm termed "uses and gratifications."

In a contemporary context, Williams (2003) states that uses and gratifications is based on three basic assumptions: 1) people are active users when they use media, 2) people are aware of their motivation of using the media and can explain their motivations, and 3) common patterns of media consumption and usage can be identified among users.

The concept has been expanded to social media. Napoli (2011) suggested that engagement is a broader phenomenon that describes various types of user attention and involvement with content. The concept of engagement now includes the involvement, real or perceived, of users producing, consuming, or disseminating information. This involvement is

often referred to as interactivity, which serves as a fundamental dimension of the concept of engagement (Ksiazek, Peer, & Lessard, 2016).

Research on interactivity has highlighted the multi-directional flow of information. The interactive nature of online media enables the audience to not only receive information but also revise and disseminate it (Jenkins, 2006; Thurman, 2008). It is commonly known that the interactive features of online media enable audiences to like, comment on and share content with other users, sometimes a mass audience. Audience analytics offer news organizations the opportunity to directly measure the audience's engagement with - and the effectiveness of - their content. Many newsrooms also embrace readers' comments with the goal to improve the quality of their news. Accordingly, this study seeks to understand if the level of interactivity is related to headlines that vary in levels of informativeness.

RQ3*: Does user interactivity (sharing, liking, commenting) with more informative health news headlines differ from interactivity with less informative headlines?*

METHOD

Design

This study employed an online experiment to test whether levels of headline informativeness affect user selection and why. The study also tests if headlines varying in levels of informativeness result in more or less sharing, liking or commenting.

Measures

Dependent variables included participants' headline selection, reason(s) for selecting a headline, and whether participants would share, like or comment on content related to the selected headline.

Stimuli and Pre-testing

The original headlines tested were randomly selected from six mainstream news sources including: two networks (*CNN* and *Fox*), two legacy print sources (*The New York Times* and the *Washington Post*) and two popular but non-traditional sources (*BuzzFeed* and *The Huffington Post)*. A total of 120 headlines collected (20 from each news organization) were coded for levels of informativeness. Two trained independent coders used an online form to record the number of the five "Ws" (who, what, where, when and why) plus "how" supplied in each headline. Initial intercoder reliability (*Scotts Pi* = .88) reached the threshold of acceptance for reliability but further discussion between coders following the first 10% of the headlines coded improved the reliability (*Scotts Pi* = .99). Headlines for the same story were then paired with one headline of low informativeness and one headline of high informativeness.

To confirm the informativeness in the headlines, a pre-test was conducted with an independent sample of eight graduate journalism students who indicated which headlines in each pair were most informative. All but three pairs of the headlines test were confirmed to differ in levels of informativeness as coded. Three pairs of headlines deemed as "no difference" were rewritten based on the feedback from pre-test participants.

Instrument

Before viewing the headlines in the online experiment, a five point Likert scale was used to measure users' level of interest in five news categories including: entertainment, sports, health, science, and politics. The online survey included eight headline pairs (from eight news stories) where each of the pairs has a low informative headline and a high informative headline. Two questions followed each headline pair. The first asked participants to indicate if primary reason for selecting the headline was more informative, interesting or personalized or raised

curiosity or for another reason. The second question asked whether participants were most likely to share, like, and/or comment about content related to the headline. Finally, demographic questions of age, gender and level of completed education completed the instrument.

Procedure

An email inviting participants 18 years and older was distributed to students in journalism and information science at a large Mid Atlantic University, offering the opportunity to be randomly selected for one of two $25 Amazon gift cards. Following the website's "welcome" page, users wishing to participate provided an IRB-approved consent then proceeded to the instructions informing participants they would be exposed to several pairs of news headlines. Participants were asked to read the headlines as they would typically read headlines online then answer two questions after each pair of headlines.

To enhance validity of the online study, participants were prohibited from completing the experiment more than once (per IP address) plus the "back" or "save" buttons were removed to prohibit participants from changing previous answers. Upon completion a "thank you" page invited participants to share the survey link with family and friends via email or social media.

RESULTS

The sample (N = 308) included 118 men (41%) and 155 women (54%). Thirty-five did not indicate their gender. Mean age was 30.3 (SD = 11.1) ranging from 18 to 66 years. Average time to complete the survey was 10.4 minutes. For education completed, 52.3% indicated a bachelor's degree, 19.2% master's, 18.8% a high school diploma, 7% associate's degree and 2.8% doctorate or JD. Consuming news online, most (47.4%) indicated "often" followed by 33.7% "occasionally", and 11.6% "hourly." Nearly 75 participants said they rarely consumed news online.

Headline informativeness

RQ1 asked whether the level of information in health news headlines significantly affect user selection. Table 1 displays the percentage of times that either a highly informative headline or a low informative headline was selected when presented in pairs. For pairs presented from eight health news stories, the percentage of participants selecting highly informative headlines was consistently higher than the selection of low information headlines. The overall mean selecting high information headlines (n = 70.9) was 63.7% compared to the mean percentage of low information headlines of 36.3% (n = 45.5). A t test indicated the difference to be statistically significant (t = 6.2, p = <.001).

Table 1.

Percentage of selection of high information versus low information headlines

Article ID	High informative		Low informative	
	n	%	*n*	%
1	97	69.8	42	30.2
2	64	58.7	45	41.3
3	80	59.3	55	40.7
4	71	55.0	58	45.0
5	74	68.5	34	31.5
6	88	69.8	38	30.2
7	100	76.9	30	23.1
8	65	51.18	62	48.82
M	79.9	63.7	45.5	36.3

Reason for selection

Comparing the reasons for selecting the preferred headline (Table 2), the majority (*n* = 449) of participants (48.0%) indicated because it was "more informative." 21.1 percent (*n* = 197 chose a headline because it "raised curiosity" and 16.3% (*n* = 152) selected headline because it was "more interesting." The primary reason that the smallest proportion of the sample selected a headline (14.7%, *n* = 137) was because the headline was "more personalized" for them. The option to check "other" was used less than ten times.

Table 2.

Number and percentage of reasons for headline selection

Reason for Selection	*n*	%
More Informative	449	48.0
Raised Curiosity	197	21.1
More Interesting	152	16.3
More Personalized	137	14.7

Further comparison of the mean percentages and *t*-test results of the reasons for selection by level of informativeness (Table 3), the mean of 61.6 % (*SD* = 4.7%) selected a high-information headline because it was more informative compared to 22.7 % (*SD* = 7.1%) selecting a low information headline because it was more informative. An independent samples t test indicated this difference was statistically significant (*t*=12.1, *p* = <.001). At the same time for headlines that raised curiosity, the majority (*M* = 34.8%, *SD* = 7.9%), selected a low-information headline while a lower percentage of participants (*M* = 13.8%, *SD* = 2.4%) chose a highly

informative headline because it raised curiosity yielding a significant t test (t = -6.7, p = <001). Low-information headlines appeared to be more interesting (M = 23.2%, SD = 7.5%) as compared to high-information headlines (M = 12.6 %, SD = 3.4%) and this difference was significant (t = -3.4, p = < .001).

Finally, although the reason of a headline being more personalized was indicated as the least of the four reasons for selection, more users selected low informative headlines (M = 19.4, SD = 5.3) for personalization than those selecting highly informative headlines (M = 12.0, SD = 4.2) and this difference was also significant, (t = - 3.4, p = .01).

Table 3.

Mean percentages and t-test results for selecting high versus low information headlines

Reason	High Informativeness		Low Informativeness			
	M	*SD*	*M*	*SD*	*t*	*Sig*
More Informative	61.6	4.7	22.7	7.1	12.1	<.001 **
Raised Curiosity	13.8	2.4	34.8	7.9	-6.7	<.001 **
More Interesting	12.6	3.4	23.2	7.5	-3.4	<.001 **
More Personalized	12.0	4.2	19.4	5.3	-2.9	.01 *

*p = <. 05 **p = < .001

Headline interactivity

Table 4 details interactivity with headlines by levels of informativeness with slightly more “likes” for low information headlines (M = 39.4 %, SD = 8.8%) compared to “likes” for high information headlines (M = 33.0 %, SD = 6.0%) but this difference was not statistically significant. In second place for interactivity, more (M = 38.6 %, SD = 7.4%) sharing was

anticipated for low information headlines compared to high information headlines (*M* = 28.5%, S*D* = 7.3%) and this difference was significant (*t* = -2.6, *p* = .02).

Finally, more participants said they would more likely comment on low informative headlines (*M* = 13.5 %, S*D* = 6.5%) than high informative headlines (*M* = 8.5%, S*D* = 3.7%) but the difference was not significant.

Table 4.

Means and t-tests comparing reasons for interactions with selected headlines.

Activity	High Informativeness		Low Informativeness			
	M	*SD*	*M*		*t*	*Sig.*
Like	33.0	6.0	39.4	8.8	-1.6	0.13
Share	28.5	7.3	38.6	7.4	-2.6	0.02 *
Comment	8.5	3.7	13.5	6.5	-1.8	0.09

DISCUSSION

The goals of this online exploratory story were to measure any significant differences in the selection of highly informative versus low information headlines, the reasons for selecting a headline, and user interactivity with selected headlines.

The results reported here raise some interesting points about how quickly user interest is determined for health news and why. To start, many news producers have believed – and some still believe – that the key to enticing users to click a headline is to "tease" the user with only limited information (so called "clickbait). Results reported across eight different health news

stories provide strong evidence that low information "teasing" headlines do not guarantee selection. In fact, the opposite outcomes were statistically significant.

Focusing on varying levels of information, headlines with the most information were selected significantly more often than the headlines with less information.

As for the reasons for selection, overall, nearly half of the participants selected a headline because it was more informative with about 16% selecting because it was "more interesting." On average, although participants were able to select one of the five reasons why they selected a headline, most (62%) selecting highly informative headlines specifically said it was because more details were provided. Significantly fewer participants (about 14%) selected a highly informative headline because it "raised curiosity."

Conversely, 35% of the participants who selected the low information headline in the pair said it was because the headline raised curiosity. Only 23% of those selecting the low information headline said it was more informative.

Although participants could select one or more interactive responses to like, share and/or comment on content related to the selected headline, only sharing produced a significant difference between headlines with more intentions to share low information headlines. One possible reason is that the novel curiosity generated by some low information headlines triggered a desire to share such novelty with others, as opposed to high information headlines that are just typically declarative sentences that provide more details. While slightly more "likes" and commenting were anticipated for low information headlines, these were not statistically different from the likes and comments for high information headlines. Combined, these results might suggest that headlines containing less information are more likely to generate user interactivity, but more evidence is needed before such a claim could be generalized.

At the same time, participants in this study reported that low information headlines (23%) were “more interesting” than high information headlines (13%). While one could only speculate why this opposite outcome occurred, one possible explanation is that the reason that a headline “raised curiosity” might have been confusingly similar to “was more interesting.” Future research should define such terms.

The findings of this study have theoretical implications. The theory of incidental exposure suggests that getting exposed to news is a by-product of users’ online activities. Users are spending a large amount of time navigating social media to meet their need for information. News organizations also offer content on social media to garner the attention of the users. That means news organizations are showcasing their content with a view to attracting the attention of these floating audiences, who do not actively seek news with prior intention. But when they find any interesting news, they tend to read it, share and comment on it.

Similarly, the results of this study showed that users are interested to like, share, and comment on health news when they find it on social media. Participants of this study tend to be interactive both in the contexts of high and low informative headlines. This suggests that news managers could write the headlines considering the levels of informativeness and present it to readers via digital spaces. This ultimately would help news organizations to reach out to wider audiences. In this way, news organizations become able to present reliable health news to the audiences, which also help combat the spread of health-related misinformation. So, it can be assumed that offering health news of legacy news media to the wider audiences would likely act as an informational tool.

Limitations

Despite several statistically significant outcomes, it is possible that more detailed differences would occur with a larger sample size. Given that data collection was unexpectedly interrupted by the COVID-19 crisis, forcing instruction from classrooms to online, the intended larger sample was not collected. On the other hand, the level of significance for many of the measures suggests that the effects of varying headline informativeness may be large enough to support smaller samples.

A second limitation is that this study focused only on health news headlines. The researchers cannot make any claim to generalize these results to other types of headlines or other content. Future research should apply similar coding and measures to see if other types of headlines would produce similar results.

Finally, even within the health news genre, the headlines from only eight health news stories served as stimuli. Future studies that explore health news should continue to expand the variety of health topics to see if also varying the subject of health issues and/or ailments would produce the same effects of varying the levels of headline informativeness.

Conclusion

Overall, this exploratory experimental research testing relatively small differences in the amounts of information presented in 8 pairs of headlines produced an impressive collection of systematic and significant differences worth noting.

At least in this case, there was an overwhelming preference for health news headlines providing more information because they, in fact, provided the user with more details. These results might suggest that digital users who are increasingly busy, distracted and/or checking news on their smaller mobile screens may prefer easy-to-read and understand headlines with more information that instantly convey useful information in a relatively short period of time.

This would be especially true for scanning users as opposed to those who have more available time to read a health news story that is much longer than a headline.

If true, such justification challenges the assumption that less informative "teasing" headlines are more effective in generating more clicks to news stories. Clearly, some users will always click less informative "teasing" headlines regardless, but these results suggest that perhaps even more users would click on more headlines when they provide more information as opposed to less information.

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