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What does the crowd think? How online comments and popularity metrics affect news credibility and issue importance

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Abstract
Online comments hold the potential to promote positive deliberative outcomes, although past work has also shown that comments can have undesired effects when the sentiment of the crowd turns negative. Does the presence of comments possibly bolster or interfere with the reception and traditional functions of news media? Informed by the Modality-Agency-Interactivity-Navigability (MAIN) model, an online experiment tested the effect of reader comments (positive vs negative), number of "re-tweets" and "likes" (low vs high), and coverage frequency (infrequent vs frequent) on news credibility and issue importance. Negative reader comments (relative to positive comments) decreased message credibility and issue importance through the sequential indirect pathway of bandwagon perceptions, attention, and construct accessibility. Study results suggest that the traditional functions of news media may be hindered by audience incivility.

Keywords
Agenda-setting, bandwagon heuristic, comments, credibility, MAIN model

A defining feature of digital media is the presence of feedback related to the opinion of others (Metzger, 2009). This is particularly evident in the domain of online news, as many news stories are now accompanied by technological "affordances" (Gibson, 1977)

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that allow audiences to express their opinion. Past research on earlier forms of audience feedback suggests that opportunities for social feedback such as letters to the editor (LTE) can serve as a "social safety valve" that allows readers to release frustrations through the process of self-expression (e.g. Lander, 1972). With that said, online comments have also been linked to detrimental outcomes in previous work (e.g. Anderson et al., 2014; Houston et al., 2011; Winter et al., 2015) when the comments of the crowd become uncivil, leading some news outlets to relocate audience discussion to social media or close their comment sections altogether.

What are the possible theoretical mechanisms through which comments might affect readers' processing of news? One theoretical framework that offers a possible answer to this question is the Modality-Agency-Interactivity-Navigability (MAIN) model (Sundar, 2008). The MAIN model theorizes that technological cues that surround the presentation of online media can affect how content is subsequently evaluated. In the case of online comments, the MAIN model theorizes that news endorsed by the majority will trigger the bandwagon heuristic or the mental shortcut that if others have praised this content, then it must be good. The activation of heuristics also shapes readers' perceptions of the content in question, leading to credibility perceptions in line with the heuristic primed by the affordances of the medium (Xu, 2013).

In addition to affecting the perceived credibility of news, a natural extension of the MAIN model's predictions is that affordances like comments might influence other news-related judgments, such as the perceived importance of issues discussed in news. The variable of issue salience has been widely studied (e.g. McCombs et al., 2014), as a rich program of agenda-setting research has demonstrated that news media affect audiences' perceptions of issue importance through the frequency that topics are covered (e.g. McCombs and Shaw, 1993). Subsequent work has also revealed that construct accessibility is one mechanism through which "first order" (e.g. Scheufele, 2000) or "agenda-cueing" (e.g. Pingree and Stoycheff, 2013) effects occur. Building on these theoretical assumptions, perceptions of issue importance should be contingent on identifying variables that heighten the accessibility of issue-related constructs in memory. In the case of positive online comments, activation of the bandwagon heuristic may augment construct accessibility by increasing readers' attentiveness to content, and by extension, the accessibility of the constructs that have been activated in memory. Alternatively, when the sentiment of comments is generally negative, suppression of the bandwagon heuristic may lead to lower levels of bandwagon support, therefore depressing attention and construct accessibility. Such possibilities illustrate a pressing theoretical question: is first-level agenda-setting influenced by the comments of other readers?

To answer this theoretical question, a between-subjects factorial experiment was conducted that tested the effect of two forms of audience feedback: reader comments (positive vs negative) and the number of times an article has been "liked" or "re-tweeted." Furthermore, the current study examined the moderating role played by the frequency that an issue is covered in the context of a social media feed. The following sections outline relevant literature on the MAIN model and agenda-setting, followed by a summary of the study's methodology, a report of results, and a discussion of theoretical and practical implications.

Audience feedback and online comments

Opportunities for audience feedback have long been a part of news consumption, whether it be radio call-ins, LTE, or public forums (e.g. Schultz, 2000). Scholars have described these chances for discussion as serving important social functions (e.g. Rafaeli, 1990), with some outlets like the *New York Herald* even inviting readings to actively share their critical thoughts (e.g. Reader, 2015). In some cases, these opportunities for audience feedback often led to expressions of negativity (e.g. Davis and Rarick, 1964), affording readers with the possible positive outcome of releasing their frustrations (e.g. Lander, 1972). The salience of negativity remains ubiquitous to contemporary news, whether it be in the selection of stories that populate news broadcasts, reader hostility toward counter-attitudinal news outlets, or the general negativity that tends to plague a variety of online forums for discussion.

Early theories of communication such as the two-step flow of communication recognized the role that audiences serve in shaping the influence of media (Katz, 1957; Lazarsfeld and Merton, 1948). The assumption that media influence the general public indirectly through affecting domain-specific opinion leaders (Katz and Lazarsfeld, 1966) underlies a variety of contemporary approaches to media effects (e.g. Neuman and Guggenheim, 2011). Keeping with this tradition, a growing body of research has examined the effects of digital forms of audience feedback such as online comments. Some studies have shown that negative opinions that co-occur alongside news can bolster perceptions of news due to operation of a contrast effect (Thorson et al., 2010). With that said, other work has shown that comments also have the potential to elicit negative effects ranging from increased perceptions of hostile media bias (e.g. Houston et al., 2011) to lower perceived credibility (e.g., Waddell, 2017) or acceptance of news article content (e.g. Kim, 2015; Winter et al., 2015). Theoretical perspectives such as the MAIN model (Sundar, 2008) attribute this pattern of results to the activation of cognitive heuristics that influence readers' perceptions of news credibility. In the case of comments, Sundar (2008) hypothesizes that comment-based effects occur due to triggering the bandwagon heuristic, or the rule of thumb that if others have positively evaluated this news, then I should too. In support of this prediction, one study (Xu, 2013) found that news articles with a high level of audience endorsement increased article sharing and click intentions through the indirect pathway of bandwagon support.

It should be noted, however, that not all comments are equal in their influence on credibility. It is increasingly apparent from recent work (e.g. Cameron and Geidner, 2014; Waddell and Sundar, 2017; Winter et al., 2015) that while negative comments often cause individuals to decrease their evaluations of article credibility, positive comments fail to have a comparable effect relative to control, which scholars have attributed to the operation of negativity bias (e.g. Rozin and Royzman, 2001). Thus, although positive comments are still germane to the study of online news, they are better suited as a contrast to the effects of negative comments. This is also a more ecologically valid approach, as news stories with some form of audience feedback are more common than news without a comments section.Thus, the current study compares the effect of negative comments on article perceptions relative to news accompanied by positive comments, with the expectation that negative comments will decrease article credibility via bandwagon perceptions. More formally, the following hypothesis is proposed:

H1. Negative comments (relative to positive comments) will decrease article credibility through the mediating pathway of bandwagon support.

Online comments and issue importance

The MAIN model was initially conceptualized as a theoretical framework dealing specifically with perceptions of media credibility (Sundar, 2008). Although the MAIN model has since been extended to multiple other domains (Sundar et al., 2015), it still remains necessary for the model to be tested with other variables to support the generalizability of the model. One such domain is the variable of issue importance, an outcome widely studied in traditional media effects research (e.g. McCombs and Shaw, 1993). Among the most prominent theories in this area is "first level" agenda-setting, which is typically defined as the influence of media coverage frequency on issue salience (McCombs et al., 2014). First-level agenda-setting is generally demonstrated through cross-sectional data that compare how often an issue is covered in media and the self-reported "salience," or importance of the issue among news consumers (Miller, 2007).

In addition to cross-sectional tests of agenda-setting effects, experimental work has been conducted to isolate the possible theoretical mechanisms through which agenda-setting effects possibly occur (e.g. Althaus and Tewksbury, 2002; Kiousis et al., 1999; Wanta, 1988). One conclusion from this work is that frequent media coverage increases the cognitive accessibility of issues that are most discussed by media, leading to an increased ease and frequency of construct retrieval. Put simply, issues that are covered frequently by media are more likely to be easily accessed from memory when making news-related judgments, triggering the perception that if information is on the top of the mind, then it must be important (e.g. the availability heuristic; Tversky and Kahneman, 1973). Experimental contexts have provided support for this theoretical pathway, with several studies showing that frequency of prior media exposure predicts the subsequent likelihood that an issue is listed on free response items as an important issue (Miller, 2007; Pingree and Stoycheff, 2013).

If accessibility is a key mechanism through which agenda-setting effects occur, then variables that drive increased attentiveness to content should exacerbate first-order agenda-setting effects. One such prospective influence are bandwagon perceptions activated by the presence of reader comments. The bias hypothesis of the heuristic-systematic model (Chen and Chaiken, 1999) predicts that heuristics can not only shape our perceptions but also motivate the processing of information. Following this theoretical warrant, activation of the bandwagon heuristic by online comments may serve as a signal that if the content has been widely viewed, then it is worthy of close attention. Multiple studies support this possible link, such as the work of Yang (2016) or Messing and Westwood (2012), who both found that popularity indicators promote greater selective exposure to group-endorsed content.

In sum, combining the theoretical perspectives of the MAIN model, agenda-setting, and the heuristic-systematic model reveals a possible pathway by which comments may affect issue importance, namely via the downstream influence of the bandwagon heuristic on self-reported attention and cognitive accessibility. More formally, the following hypothesis is proposed:

H2. Negative comments (relative to positive comments) will decrease issue importance through the mediating pathway of bandwagon support, attention, and construct accessibility.

Moderators of comment effects: re-tweet and likes

Reader comments are not the only type of audience feedback that may supplement online news. As a quick scan of many news websites will show, it is also common for online news to display the frequency that an article has been accessed via metrics such as "shares," "likes," and "re-tweets." These metrics have a common feature: they specify the potential size of the audience exposed to news. In other words, if a news story was accompanied by negative comments with many re-tweets and likes, it might be assumed that readers were not only negative but also quite large as an audience overall, which is likely to generate higher bandwagon perceptions than an audience assumed to be small in size based on re-tweets and likes.

Theoretical support for such a moderating effect of crowd size differs based on the theory in question. On one hand, re-tweets and likes can be categorized as a form of "base-rate" information (Zillmann, 1999). Specifically, exemplification theory (Zillmann and Brosius, 2012) explains that base-rate information such as statistics are relatively inconsequential to readers' perceptions because they are pallid and difficult to process. If page views and shares also operate as base rates, then it is unlikely that they will moderate the effects of reader comments. In support of this theoretical categorization, several studies have failed to find evidence that likes or page views affect readers' perceptions of news (Peter et al., 2014; Winter et al., 2015), which would be consistent with the pattern predicted by exemplification.

On the other hand, theoretical perspectives such as the MAIN model (Sundar, 2008) categorize likes and page views as peripheral cues that are processed heuristically rather than systematically. As a result, base rates expressed by technological affordances may no longer be difficult to process because they operate via heuristics, which do not require the careful reasoning typically necessitated by base-rate information. In support of this prediction, one study (Spartz et al., 2015) found that the number of times a YouTube video was viewed heightened the perceived importance of the issue discussed by the video, an outcome unlikely if crowd size metrics are processed as base-rate information. Thus, examining the effect of re-tweets and likes provides the opportunity to test the assumptions of two alternative theories. If no moderating effect of re-tweets and likes is found, then exemplification as a theoretical framework will be supported, while a significant moderating effect of re-tweets/likes will support the tenets of the MAIN model. Given the conflicting evidence described above, the following research question is proposed:

RQ1. Does the number of re-tweets/likes moderate the parallel or sequential indirect effect of negative comments on article perceptions?

Moderators of comment effects: issue frequency

While theory suggests that comments may be influential in shaping readers' news perceptions, all media effects should be contextualized according to their potential boundary

conditions (Walther, 2009). In the context of agenda-setting, one established moderating variable is the frequency that an issue has been covered by media (e.g. McCombs and Shaw, 1993). Specifically, while the crowd may be critical of a news article or an issue's importance, the stance of the media (as expressed by the frequency of their coverage) may conflict with the crowd's evaluation. For example, it is unclear if comments have a uniform effect on issue importance even when construct accessibility is heightened by frequent news coverage. This and similar boundary conditions are critical to identify, as the new media landscape is saturated by a variety of cues related to the sentiment of others (Metzger, 2009) that may alter the assumptions of traditional media effects theories like agenda-setting. This article, thus, proposes the following research question:

RQ2. Does coverage frequency moderate the parallel or sequential indirect effect of negative comments on article perceptions?

Methods

An online experiment tested a 2 (comment valence: positive vs negative) × 2 (coverage frequency: infrequent vs frequent) × 2 (number of re-tweets and favorites: low vs high) between-subjects factorial design. Participants ($N = 289$) were randomly assigned to one of eight possible conditions, in which they were asked to browse a Twitter feed that had either a low or high number of stories about heroin addiction, a topic which served as the attitude object for the study. After viewing the Twitter feed, participants then proceeded to read a news story from the aforementioned Twitter feed that was accompanied by the manipulations of comment valence and number of re-tweets/likes, as described below.

Participants

Two hundred and eighty-nine participants from the United States were recruited to participate in the study using the crowdsourcing website, *Amazon Mechanical Turk* (Buhrmester et al., 2011). Each participant was paid 25 cents for his or her participation in the study. The study was approved by the Institutional Review Board at the University of the primary investigator. All participants provided implied consent on an online questionnaire before participation. Participants' were 55%female with a mean age of 36.02. When asked to self-report their race, 77% reported "White/Caucasian" ($N = 221$), 9% reported "Asian/Asian American" ($N = 27$), 9% reported "Black/African American" ($N = 26$), 2% reported "Hispanic/Latino/Latina" ($N = 6$), and 3% reported "Bi-racial/Multi-racial" ($N = 9$). MTurk samples such as the one used in this study generally do not reflect the composition of the US population, but do demonstrate greater variability in terms of respondent age and race than traditional college-student samples (e.g. Paolacci et al., 2014).

Stimuli

Participants were exposed to a series of stimuli intended to simulate how news is typically encountered on a social media feed. First, participants were shown a screenshot from the social media website *Twitter* that showed a list of Tweets supposedly taken from the *New York Times* Twitter page. After browsing the list of stories shown in the

screenshot, participants were then directed to a second page that contained an expanded Tweet from the previous page about a story on heroin addiction, where reader comments and the number of times the story had been re-tweeted/liked were visible. Finally, participants were directed to a third page where they read a seven-paragraph story about heroin addiction that was just previewed in the expanded Tweet. The story described a string of eight overdoses from heroin that happened over the course of 8 hours in the county of Washington, Pennsylvania.

The issue of heroin addiction was chosen as the context for the news story because it was an issue that was relatively topical when the study was conducted (circa 2016) but not yet polarized according to political affiliation. While single-message designs have their limitations that are important to consider (O'Keefe, 2015), such concerns are typically more germane when content is used as the manipulation for an experimental factor.

Treatment conditions

Coverage frequency. A mock news feed from *Twitter* was created to vary the frequency that the issue of heroin addiction was "tweeted" about by the *New York Times*. In the "high frequency" condition, the issue of heroin addiction was mentioned five times out of eight total Tweets, while in the "low frequency" condition, the issue of heroin addiction was mentioned one time out of eight total Tweets.

Comment valence. The second page of the study displayed an expanded Tweet with a news story on heroin addiction. Under the story, three reader comments were displayed that either praised the coverage by the *New York Times* (the positive condition) or criticized the quality of the news article and its coverage (the negative condition). The content of the Tweets was held constant between conditions aside from varying the presence of adjectives to manipulate the valence of the statements, as shown in Table 1. Given that most news articles now feature a comments section, a true control condition (e.g. an article with no comments) was omitted from the experimental design for the sake of external validity and parsimony. Past research has conducted contrasts between positive, negative, and no-comment controls, with findings showing that positive comments often do not vary significantly in their effects from control (e.g. Cameron and Geidner, 2014; Waddell and Bailey, 2017a; Winter et al., 2015).

Number of re-tweets and likes. In addition to varying the valence of comments, the expanded Tweet displayed the number of times the story had been "re-tweeted" and

Table 1. Comment valence manipulation.

Positive comments	Negative comments
@nytimes great reporting, such an important topic	@nytimes awful reporting, such a unimportant topic
@nytimes typical excellent coverage from nyt	@nytimes typical crappy coverage from nyt
@nytimes so topical, this belongs in the news	@nytimes who cares, this doesn't belong in the news

"liked" by others. In the low re-tweets and likes condition, the story was re-tweeted and liked "12" and "14" times, respectively, while in the high condition, the story had been re-tweeted and liked "12317" and "14258" times, respectively.

Manipulation checks

Issue coverage recall. In order to determine the efficacy of the coverage frequency manipulation, a single seven-point semantic differential scale asked whether the issue of heroin addiction had been mentioned "very few times" or "many times" on the Twitter feed viewed at the start of the study.

Comment sentiment. In order to determine the efficacy of the comment valence manipulation, a single seven-point semantic differential scale asked whether the comments below the expanded Tweet about heroin addiction were "mostly negative" or "mostly positive."

Number of re-tweets/favorites. In order to determine the efficacy of the re-tweets and likes manipulation, a single seven-point semantic differential scale asked whether the expanded Tweet about heroin addiction had "a relatively low number of re-tweets and likes" or "a relatively high number of re-tweets and likes."

Mediating variables

Bandwagon perceptions. Five Likert-type items (1 = "not at all likely," 7 = "very likely") adapted from previous research (Xu, 2013) were used to measure bandwagon perceptions. Items included the following: "How likely are other people to enjoy reading this news article?" "How likely is it that other people would think this news article is valuable?" "How likely is that that other people would rate this news article positively?" "How likely is it that other people would share this news article?" and "How likely is it that other people would recommend this news article?" An index was formed by averaging the five items, which was reliable (Cronbach's $\alpha = .90$; $M = 4.05$, $SD = 1.45$). Each of the five items were normally distributed, significantly correlated, and loaded on a single factor.

Attention. Three Likert-type items (1 = "strongly disagree," 7 = "strongly agree") adapted from previous research (Perse, 1990) were used to measure self-reported attention. Participants were asked to indicate the extent to which they "concentrated," "paid attention," and "used mental effort" while reading the news story. An index was formed by combining the three items, which was reliable (Cronbach's $\alpha = .87$; $M = 6.14$, $SD = 1.03$). The three items were significantly correlated and loaded on a single factor.

Construct accessibility. Participants were asked to respond to the following open-ended question: "if a friend who doesn't watch the news much asked you what you think is the most important news you've heard about lately, what would you say to him or her?" Participants who did not mention the issue of heroin addiction were assigned a zero,

while any response that mentioned heroin addiction was assigned a value of one. A value of two was assigned to participants who both mentioned heroin addiction and listed it as the most important issue in their response. This measure and coding protocol is consistent with the validated procedure used to measure construct accessibility in past work (Pingree and Stoycheff, 2013). The issue of heroin addiction was mentioned relatively infrequently ($M = .53$, $SD = .85$) based on the shape of the distribution.

Dependent variables

Article credibility. The authors have recently called attention to the need for distinguishing between factors that contribute to message credibility and factors that measure credibility directly (Appleman and Sundar, 2015). The present work focused on "reflective indicators" that measure message credibility directly. Specifically, three Likert-type items (1 = "strongly disagree," 7 = "strongly agree") adapted from previous research (Appleman and Sundar, 2015) were used to measure the credibility of the news article. Participants were asked to indicate the extent to which they agreed that the news article was "accurate," "authentic," and believable." An index was formed by combining the three items, which was reliable (Cronbach's $\alpha = .90$; $M = 5.67$, $SD = 1.07$). Each of the three items was significantly correlated and loaded on a single factor.

Issue importance. Four seven-point semantic differential items adapted from previous research (Paek et al., 2012) were used to measure issue importance. Specifically, participants were asked to indicate whether they thought the issue of heroin addiction in the United States was "trivial/serious," "unimportant/important," "not worth much concern/worth a lot of concern," and "irrelevant/relevant." An index was formed by combining the four items, which was reliable (Cronbach's $\alpha = .96$; $M = 5.80$, $SD = 1.37$). Each of the four items were significantly correlated and loaded on a single factor.

Other measures

Participants were asked to report their age, sex, and race on the first page of the questionnaire for the purpose of compiling descriptive statistics.

Results

Manipulation checks

Issue coverage recall. A one-tailed t-test with coverage frequency as the independent variable and issue coverage recall as the dependent variable was significant, $t(287) = 16.96$, $p < .0001$, $d = 2.00$, such that participants in the high coverage frequency condition were more likely to report that the issue was covered "a lot of times" ($M = 5.34$) than those in the low coverage frequency condition ($M = 2.14$).

Comment sentiment. A one-tailed t-test with comment valence as the independent variable and comment sentiment as the dependent variable was significant, $t(287) = 22.25$,

$p < .0001$, $d = 2.65$, such that participants in the negative comment condition were more likely to report that the comments were "mostly negative" ($M = 1.31$) than those in the positive comment condition ($M = 5.37$).

Number of re-tweets/favorites. A one-tailed t-test with the number of re-tweets/favorites as the independent variable and recall of the number of re-tweets/favorites as the dependent variable was significant, $t(287) = 4.19$, $p < .0001$, $d = .49$, such that participants in the high number of re-tweets and likes condition were more likely to report that the story had a "large number of re-tweets/favorites" ($M = 3.88$) than those in the low condition ($M = 3.09$). In sum, each of the three manipulations was successful.

Main analyses

Structural equation modeling (SEM) was employed to test study hypotheses. The model was tested using 5000 bootstrapped samples and 95% confidence intervals. Indirect effects were tested via user-defined estimands with AMOS statistical software. An analysis of model fit statistics, including comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR), suggests that the fit of the model was acceptable, χ^2 (139) = 267.32, $p < .0001$; CFI = .96; RMSEA = .06, $p = .14$; SRMR = .08. Furthermore, there were no missing data for key-dependent variables or Heywood cases, while calculation of Mahalanobis' distance revealed no multivariate outliers. In short, the assumptions of SEM appear to have been satisfied in line with best practices for SEM identified in the past work (Goodboy and Kline, 2017).

H1 predicted that negative comments would decrease article credibility via the indirect pathway of bandwagon perceptions. As shown in Figure 1, *H1* was supported. Specifically, negative comments (relative to positive comments) decreased perceptions of bandwagon support ($\beta = -.39$, $p < .0001$), which was positively related to article credibility ($\beta = .34$, $p < .0001$). The indirect effect ($a_1b_1 = -.26$, $p < .0001$) was significant because the bias-adjusted confidence interval for the effect did not include zero [95% CI, −.40, −.15]. The direct effect of negative comments on article credibility independent of bandwagon perceptions was non-significant ($c' = .04$, $p = .83$).

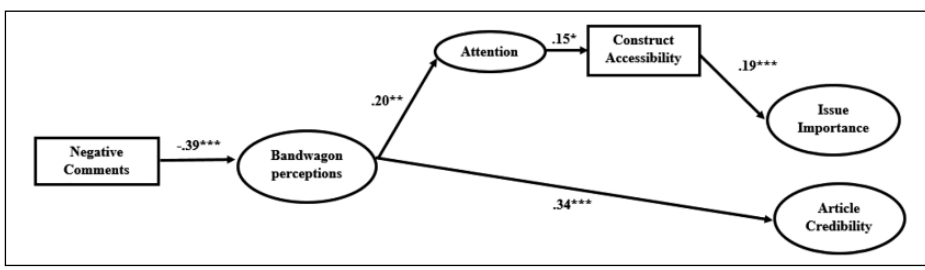

Figure 1. Indirect effect of comments on article credibility and issue importance.
*$p < .05$, **$p < .01$,***$p < .0001$.
0 = Positive comments, 1 = negative comments.

H2 predicted that negative comments would have decreased issue importance via the indirect pathway of bandwagon perceptions, attention, and construct accessibility. As shown in Figure 1, *H2* was also supported. Again, negative comments (relative to positive comments) decreased perceptions of bandwagon support, which was positively related to attention ($\beta = .20$, $p = .002$). Furthermore, attention was positively related to construct accessibility ($\beta = .15$, $p = .01$), which was then correlated with issue importance ($\beta = .19$, $p < .0001$). The indirect effect ($a_1b_1c_1d_1 = -.005$, $p = .007$) was significant because the bias-adjusted confidence interval for the effect did not include zero [95% CI, −.02, −.001]. The direct effect of negative comments on article credibility independent of bandwagon perceptions, attention, and construct accessibility was non-significant ($c' = -.01$, $p = .55$).

RQ1 and *RQ2* asked whether the number of re-tweets/likes or the frequency of issue coverage would moderate the indirect effect of reader comments on article credibility and issue perception. To test these research questions, a series of multiple group analyses were conducted that compared the fit of two models: one model that allowed the indirect effect to vary between groups and one that constrained the effect to be invariant between groups. A significant chi-square difference test would suggest the presence of moderation by the grouping variable selected.

Beginning first with *RQ1* for article credibility, a chi-square difference test compared two models: (1) one that allowed the difference between low and high re-tweets/likes to vary freely and (2) one that constrained estimates between groups for the indirect effect to be invariant. The findings show that the difference in model fit was non-significant, $\Delta\chi^2 = .56$, $df = 2$, $p = .76$. As a result, no evidence for moderation of the indirect effect by coverage frequency was found.

RQ1 also asked whether the effect of comments on issue importance would be moderated by re-tweets/likes. A similar series of model was again run, with the results of a chi-square difference test again showing no evidence of moderation by number of re-tweets/likes, $\Delta\chi^2 = 4.25$, $df = 4$, $p = .37$. Put another way, there was no evidence that the strength of the indirect effect was different between participants in the low and high re-tweets/likes conditions for either article credibility or issue importance.

RQ2 asked a similar question regarding moderation, namely, if coverage frequency would alter the indirect effects hypothesized by *H1* and *H2*. A similar process of comparing constrained and unconstrained structural equation models was employed to test this possibility. The moderating effect of coverage frequency was non-significant for both article credibility, $\Delta\chi2 = 4.03$, $df = 2$, $p = .13$, and issue importance, $\Delta\chi^2 = 4.59$, $df = 4$, $p = .33$. In other words, neither of the indirect effects described above were conditional on the frequency that the news story was covered.

Summary of results

In sum, study results reveal that negative comments (relative to positive comments) decreased newsreaders' perceptions of article credibility and issue importance through distinct psychological mechanisms. In terms of article credibility, the effect of negative comments operated through decreased perceptions of bandwagon support, while the effect of negative comments on issue importance was mediated sequentially by

bandwagon perceptions, attention, and construct accessibility. These effects operated uniformly regardless of the number of times the issue was covered by a news outlet or the frequency that the issue was liked/re-tweeted by other readers.

Discussion

This study merged the assumptions of three theoretical perspectives to test the effect of online comments, with results showing that negative comments can affect a host of variables relevant to readers' processing of news content. Beginning first with article credibility, results show that negative comments decreased perceptions of article credibility via lower bandwagon support. This finding contributes to the existing literature on comment effects (Anderson et al., 2014; Houston et al., 2011; Waddell & Bailey, 2017b; Winter et al., 2015) by revealing a prospective mechanism through which these effects occur, namely, by inducing readers to adopt an opinion consistent with the sentiment of the assumed majority. The effect also appears to be uniform across both coverage frequency and whether the news has been widely re-tweeted/liked, which suggests that the influence of negative comments is quite persuasive across several common contextual variables. In other words, the influence of online comments appears to be direct rather than conditional, at least in the present context of online news.

It should also be noted that negative comments had a small, significant effect on issue importance via bandwagon support, attention, and construct accessibility. Specifically, negative comments decreased perceptions of crowd support, which was subsequently related to lower attentiveness and construct accessibility, thus attenuating the first-level agenda-setting effect. This outcome extends agenda-setting theory (e.g. McCombs and Shaw, 1993) to a novel domain by showing that technological variables surrounding news content can affect the accessibility-based mechanism of first-order agenda-setting effects. More broadly, this finding supports the psychological significance of the role played by audiences in the co-creation of news content, while also calling attention to the need for reconsidering traditional media effects theory, given the advent of affordance laden media. Finally, the influence of comments on issue importance extends the MAIN model to a previously understudied domain, further supporting the generalizability of the framework beyond the variable of credibility (Sundar, 2008). With that said, it is important to again acknowledge that these effects were relatively small in magnitude, thus implying that other variables not measured in the present work (e.g. cumulative media exposure, peer/family influence, and culture) also play a role in shaping audiences' perceptions of issue salience.

While comments affected readers' reception of news content, no evidence was found for moderation effects based on the number of likes and re-tweets that accompanied the news story. This null finding lends support to exemplification theory (Zillmann, 1999) and the conceptualization of likes/re-tweets as a form of base-rate information, similar to readers' poor ability to process numerical information such as population statistics in traditional media. The null result also delineates a boundary condition for the MAIN model (Sundar, 2008) by showing that not all forms of audience metrics are influential to perceptions of crowd sentiment. Given the results of the current work, it appears that comments are more likely to affect audience perceptions of news credibility and issue importance than alternative indicators of popularity such as re-tweets or likes.

The results of the current study hold multiple implications for news organizations. First and foremost, it appears that concerns regarding the effects of reader comments are well warranted, given that both article credibility and the perceived importance of the issue discussed were attenuated by the presence of negative comments. Uncivil online comments could be a potential threat to the perceived journalistic quality of news, which may warrant news organization to further consider the ways in which online comments can be moderated, de-anonymized, or removed to reduce negativity. It should also be noted that the influence of negative comments on issue importance was invariant between less and more frequently covered issues. This represents a significant challenge to the gatekeeping role customarily served by news media, as negative comments can undercut the perceived importance of issues that would typically be ascribed salience due to the frequency of their coverage. In short, the threat of negative comments appears to undermine traditional cues offered by media to indicate credibility and importance, further heightening the urgency of possible solutions for managing comments sections that accompany online news.

Limitations and future research

Any study should be interpreted with a healthy amount of skepticism and contextualization according to the weaknesses of the work itself. One notable limitation of this study is the use of a single-message design, which has recently been critiqued as a threat germane to media effects research overall (O'Keefe, 2015). The use of a single news outlet is also a limitation, as readers' prior attitudes toward the *New York Times* or the topic of heroin addiction could elicit hostile media effects. Given these limitations, it would be valuable for future research to test the moderating role of news type in examining prospective affordance by content interactions while holding a news outlet constant with a fictitious media entity. This study's manipulation of comments could also be improved by the inclusion of a true control condition (e.g. no comments), while also testing the effects of comments that are mixed rather than uniform in sentiment. The moderating role of coverage frequency could also be measured rather than experimentally manipulated, such as by testing the differential response to comments between light and heavy news consumers. Finally, the typical limitations of experimental work are also applicable to the current study, which can be addressed by replicating this work with a more diverse sample in terms of age, ethnicity, and education in a naturalistic setting.

Conclusion

Study results show that readers' ability to express the self via comments can shape news evaluations, in terms of both credibility judgments and the perceived importance of issues that media cover. Furthermore, mediation analyses reveal that such comment effects occur due to bandwagon perceptions and its downstream influence on known mediators of agenda-setting effects such as attention and construct accessibility. The affordances of digital media, and the agency they provide to readers, thus continue a long tradition of the audience playing a role in shaping the construction and effects of news.

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