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ABSTRACT

Expressions of emotions are common in news posts on social media. News providers embed emotional expressions to grab users' attention and entice them to read the full article. However, there is a lack of empirical evidence to support this practice. We develop a theoretical model using emotions as social information theory to explain how, when and why the arousal of emotions expressed in headlines influences news article reading in social media. Through three experiments, we provide converging evidence that the use of expressed arousal backfires and reduces news reading. We also reveal a context-dependent boundary condition (i.e., information gap) and explore underlying mechanisms. Our findings speak to the growing literature on emotional expressions in social media and challenge the assumption that expressed arousal is beneficial in increasing news readership in social media.

Keywords

News reading, social media, expressed arousal, emotions as social information.

INTRODUCTION

News reading is an important activity for social media users (Sismeiro and Mahmood 2018, Oh et al. 2022). News on social media is typically provided in the form of a news post, which are snippets of full articles from news providers (Dellarocas et al. 2016). Despite controversies related to fake news, about one-third of US adults still view news posts on social media (Walker and Eva Matsa 2021). News reading on social media platforms is important not only for users, but also for social media platforms and news providers. In addition to increasing user engagement on social media platforms, news reading positively impacts news providers when social media users read full articles on the news providers' website (Stocking 2019). Because the print circulation of news has declined drastically in the past few years, news providers are increasingly relying on digital advertising revenues (Barthel 2019, Grieco 2020). In 2020, news providers' digital advertising revenues accounted for 39% of the total revenues, up from 35% in 2019 (Barthel and Worden 2021). Therefore, news providers depend on traffic from social media platforms to generate advertising revenues.

To entice users to read the full news article, news providers regularly utilize various tactics in the headlines intended to grab social media readers' attention (Frampton 2015, Gardiner 2015). In particular, enhancing arousal is a commonly used tactic (Gardiner 2015). For example, "This is unbelievable! I have NEVER seen anything like THIS in my entire life! Wow" (Mukherjee et al. 2022). A basis for the popularity of this practice is evidence that expressed arousal in news headlines increases sharing of news on social media (Berger 2011, Berger and Milkman 2012), and a common belief is that news reading and news sharing are similar behaviors. However, recent studies indicate that the antecedents for sharing, and reading are different. For instance, Oh et al. (2016) provide evidence that headlines with positive valence drives news sharing whereas headlines with negative valence drives news reading. Thus, the positive relationship between expressed arousal and news *sharing* may or may not apply to news *reading* (Gardiner 2015). *Sharing* of a news post (which goes viral) may not necessarily lead to revenue for the news publishers unless the articles are *read*. If the antecedents to sharing and reading were incorrectly assumed to be the same, then the news publishers would be misguided, and they might implement tactics that end up hurting their revenue.

This paper explores the following question: How, when and why does expressed arousal in news headlines influence social media users' reading intention? Based on the Emotions As Social Information (EASI) theory (Van Kleef 2009), we developed a research model to explain the effect of expressed arousal, and we contextualized news reading on social media using an actor-observer scenario (Yin et al. 2017). In this setting, news providers (actors) may enhance expressed arousal in headlines, and social media users (observers) react to the expressed arousal affectively and make inferences (such as the credibility of the news source). In practice, news providers not only vary expressed arousal but they may also withhold information to create an information gap, defined as the gap between what one knows and perceptions of what one needs to know (Hardy III et al. 2019). Extending EASI, we propose information gap as a boundary condition for the effect of expressed arousal. Therefore, our theoretical model not only proposes affective and inferential processes that may underlie the effects of expressed arousal in news headlines, but also provides a context-specific boundary condition.

We conducted three experiments to test the hypotheses. Results from an initial experiment revealed a negative effect of expressed arousal on reading intention and that this effect was dependent on information gap. Two follow-up experiments revealed that the inferential process through source credibility explains the negative effect of

expressed arousal on reading intention when information gap is high. When information gap is low, however, expressed arousal has no effect, and it arises from the existence of competing processes (i.e., source credibility inference and felt arousal) that cancel each other out.

This paper makes three contributions to theory. First, our findings complement recent literature attempting to differentiate antecedents of news reading from previously established antecedents of news sharing on social media. Second, our theoretical model highlights the importance of persuasion inferences relative to the emotional contagion processes, which have been documented in prior work. Finally, we reveal a novel, context-specific boundary condition for the impact of expressed arousal and go beyond the exploration of mechanism provided in prior literature.

THEORETICAL DEVELOPMENT AND HYPOTHESES

News Reading

Digitization of information has transformed news reading from traditional newspapers to digital platforms such as news websites and social media (Shearer 2021). Despite controversies related to fake news and user privacy (e.g., Cambridge Analytica scandal) (Auxier 2020), social media platforms remain popular, receiving viewership of more than 325 hours from users (Suciu 2021) and generating more than 60% of the total advertising revenues among digital platforms in 2020 (Pew Research Center 2021).

It is not surprising that many news providers attempt to generate advertising revenue on their websites by luring social media users through headlines intended to grab their attention. News consumption on social media is important for news providers (Oh et al. 2022). Social media users who browse news headlines on social media are likely to transition to news providers' websites to read the full articles. Therefore, many news providers develop "catchy" headlines commonly referred to as "clickbait" (Kadian et al. 2018). The popularity of this practice is based on the assumption that users are drawn to and are more likely to click on "clickbait" headlines (Gardiner 2015). However, there is scant empirical evidence to support this assumption. Furthermore, prior research in this area has focused mostly on developing advanced machine learning methods to detect "clickbait" headlines (Kadian et al. 2018). In contrast, we know much less about the impact of "clickbait" tactics on news reading on the receiving end.

Three recent lines of inquiries have started to investigate the drivers of news reading on social media. The first line focused on user's evaluation of source and content credibility (Kim and Dennis 2019, Moravec et al. 2020). The second line explored the characteristic of news providers' website, such as user interface, referral channels and paywalls (Dellarocas et al. 2016, Sismeiro and Mahmood 2018, Bar-Gill et al. 2021, Oh et al. 2022). The third line examined discrete emotions and expressed valence in news headlines (Deng and Chau 2021, Oh et al.

2022). Our research contributes to the third line of inquiry by exploring the role of expressed arousal in news headlines on social media. We focus on expressed arousal because its impact on news reading is assumed to be positive by both practitioners and researchers (Gardiner 2015), but this assumption has not been empirically validated.

Expressed Arousal

Emotions are generally classified using the dimensions of arousal and valence (Russell 1980, Niedenthal 2008). Arousal refers to the degree of activation expressed by an individual, whereas valence refers to the degree to which an individual expresses positive (i.e., pleasant) or negative (i.e., unpleasant) affective states. In the context of news on social media, expressed arousal in news refers to the intensity of emotions embedded in a headline's text. When communication occurs through text, one cannot observe the actual physiological states of the person expressing emotions; therefore, the writer's expressed emotions need to be inferred from the text (Yin et al. 2017). Arousal can be expressed in news headlines explicitly through the use of intensifiers (e.g., "very," "really") (Harris and Paradice 2007) or implicitly through the use of capitalization or exclamation marks (Schandorf 2013).

News providers utilize expressed arousal in social media because it increases sharing (Berger 2011, Berger and Milkman 2012). However, news sharing and news reading on social media are different behaviors. For example, they are influenced by news valence differently: news with positive valence is shared more whereas news with negative valence is read more on social media (Oh et al. 2022). Therefore, we should not assume that expressed arousal will increase reading because arousal increases sharing. Next, we build on Emotions as Social Information Theory and develop a theoretical model to explain how, why and when expressed arousal influences reading in social media.

Emotions as Social Information Theory

Expressed arousal can influence news reading on social media through the competing mechanisms of felt arousal and inferences of source credibility. We build on the theoretical lens of Emotions as Social Information (EASI) theory to explain these competing mechanisms. EASI is a psychological theory that explains the social functions of expressed emotions (Van Kleef 2009, 2010). The theory describes how the expression of one's emotions influences others. The basic idea of EASI is that when an actor expresses emotions, the observers can react either affectively or make inferences about the actor, which will further influence their attitudes and behaviors. We will now discuss the affective and inferential mechanisms in the following sections.

Felt Arousal

The first mechanism we propose is emotional contagion, whereby expressed arousal in news headlines can positively influence social media users' felt arousal. In the context of social media, news providers frequently embed emotions in text of news headlines (Deng and Chau 2021, Mukherjee et al. 2022). When social media users read these headlines, they may react affectively by increased felt arousal, defined as the intensity of emotions or activation experienced by an individual (Berger 2011). This process of spreading emotion from one entity to another is commonly referred to as emotional contagion (Hatfield et al. 1993). Emotional contagion is an established phenomenon and has been observed in a variety of settings (e.g., face-to-face interactions, text-based verbal communications) (Peters and Kashima 2015, Goldenberg and Gross 2020). A common example of emotional contagion can be seen when a person's expressed laughter influences others to start laughing as well (Weber and Quiring 2019). Now, EASI posits that when an actor expresses emotions the observer is likely to react affectively and perform a behavior accordingly (Van Kleef 2009). Therefore, expressed arousal in news headlines will influence social media users' attitude and behavior.

A higher level of felt arousal should in turn have a positive impact on social media users' news reading. Higher levels of felt arousal motivate people to take action and perform corresponding behaviors with regard to the focus of their attention (e.g., increased sharing of news, faster response to negotiations) (Brooks and Schweitzer 2011, Berger and Milkman 2012). In the case of news on social media, heightened emotional arousal felt by the users should prompt them to perform the action of news reading. Based on the arguments provided above, we propose the following hypothesis.

Hypothesis 1: Expressed arousal in news headlines has a positive effect on reading intention on social media.

Source Credibility

Next, we propose that expressed arousal in news headline may also lead readers to make inferences about the news provider's credibility. According to EASI, when an actor expresses emotions, the observer may make inferences about the actor's characteristics and intentions (Keltner and Haidt 1999, Van Kleef 2009). Expression of emotions in news headline is intended to grab readers' attention, and this tactic is generally employed by low credibility "tabloid" news providers to persuade users to read articles (Spillane et al. 2020). On the receiving end, people accumulate knowledge about the persuasion tactics, such as emotional arousal, used by others (Friestad and Wright 1994). The accumulation of this knowledge is referred to as persuasion knowledge (Friestad and Wright 1994, Kirmani and Zhu 2007). When people detect the use of a persuasion tactic, it makes them suspicious about ulterior motives of the entity utilizing the tactic (Campbell 1995, Kirmani and Zhu 2007). In other words, the recognition of

persuasion tactics leads people to doubt the credibility of the source that provided the information (Isaac and Grayson 2017). Therefore, when people encounter expressed arousal in news posts, it should activate their persuasion knowledge about the news source, leading to inferences of low source credibility.

Lower levels of source credibility should dampen readers' intention to read the news. Consumers rely on heuristic cues about the service provider when making decisions about consuming a product (Gugerty and Link 2020). In the case of news on social media, people use source credibility as a cue to make judgements about the information from the news provider (Johnson and Kaye 2015). Evaluation of source credibility helps users make behavioral decision about reading the news articles (Kim and Dennis 2019, Deng and Chau 2021). A news provider that is perceived to have high credibility is likely to follow up the news headline with complete and credible information in the news article compared to a news provider that is perceived to have low credibility. Therefore, source credibility will have a positive impact on social media user's news reading. Taken together, we propose the following hypothesis.

Hypothesis 2: Expressed arousal in news headlines has a negative effect on reading intention on social media.

Information Gap

Information gap will moderate the effect of expressed arousal on social media user's news reading. News providers generally vary the amount of information provided on social media (Blom and Hansen 2015). They construct headlines to hook potential readers, then wait to reveal key information in the body of the article. This variation creates information gap, defined as the gap between what one knows and what one needs to know (Hardy III et al. 2019). Perceiving an information gap increases the level of effort people are motivated to expend in order to understand the underlying information. EASI refers to this as epistemic motivation (Van Kleef 2009, 2010). When information gap is high, epistemic motivation increases. As a result, when processing emotional information, people rely on their inferential process more than their affective process (Van Kleef 2009, 2010). In other words, when information gap is high, people are more deliberate about understanding the information they are consuming, instead of relying on an automatic reaction. Consequently, consistent with our mediation hypothesis proposed above, we expect that when information gap is high, the negative effect of emotional arousal via source credibility with have a larger effect on reading intention, compared to when information gap is low.

Hypothesis 3: The negative effect of expressed arousal on news reading intention is greater for high information gap than for low information gap, such that a) expressed arousal has a negative effect on news reading intention for high information gap, and that b) the negative effect of

expressed arousal on reading intention for low information gap is weaker or non-existent.

METHOD

We conducted three experimental studies to test these hypotheses. Study 1 manipulated expressed arousal and information gap to test the effect of expressed arousal on reading intentions for high and low information gap conditions. In Study 2A we focused on high information gap and explored the competing mechanisms of felt arousal and source credibility. Finally, in Study 2B we focused on low information gap and examined the mechanisms.

STUDY 1

We conducted the first study by manipulating expressed arousal and information gap within-subjects. Each participant was asked to read and evaluate four news posts from social media.

Stimulus

We developed the stimuli by collecting headlines from *Scientific American* magazine. *Scientific American* publishes scientific articles for the general audience. The headlines we chose were inclusive, such that people of all ages could associate with them. We utilized capitalization of words and exclamation marks to manipulate expressed arousal because they reflect verbal communication of high volume (e.g., shouting) and indicate a high level of arousal (Schandorf 2013). The news post text consisted of a headline and a snippet. The headline introduced the topic, but it did not reveal complete information to the readers. The snippet provided complete information about the news. Information gap was manipulated by exclusion of snippet (high information gap) and inclusion of snippet (low information gap) in the social media post. To make the news posts realistic we included images along with the text. The images used in the news posts were similar across conditions.

Procedure

A total of three hundred and fifty-one undergraduate students at a southern U.S. university participated in the study in exchange for course credit. In the cover story, we informed participants that news created by news providers is often provided as news posts on social media platforms. We then asked the participants to evaluate four news posts. The presentation order of our treatments and headlines sets was counterbalanced.

Measures

We asked participants to report their intentions to read the news after presenting each news post. We measured intention to read the full article on the news publisher's website using a seven-point Likert scale, with three items adapted from Chen et al. (2014) (e.g., "How likely would you be to expend effort to read the full article of this news?"). For conducting manipulation checks, we measure expressed arousal using a seven-point semantic differential scale, with three items adapted from Yin et al. (2017) (e.g., "Very passive/ Very active"). We also measured information gap using a 100 point percentage scale, with three items (e.g., "What percentage of the information in the news snippet remains to be discovered? ").

Results

First, we conducted a manipulation check for expressed arousal. We used a repeated-measures ANOVA with expressed arousal as a within-subject factor. Results revealed that perceived arousal in the low expressed arousal condition was significantly lower than that in the high expressed arousal condition (M = 3.789 vs. 4.303, $F(1, 350) = 48.498$, $p < 0.001$). Then, we examined effectiveness of our manipulation of information gap by using a repeated-measures ANOVA with information gap as a within-subject factor. Results indicated that perceived information gap in the low information gap condition was significantly lower than in the high information gap condition (M = 54.817 vs. 60.317, $F(1, 350) = 35.509$, $p < 0.001$).

Next, we examined the main effect of expressed arousal on reading intentions and the moderating effect of information gap. We conducted a repeated-measures ANOVA with reading intentions as the outcome variable. Results revealed that expressed arousal significantly reduced reading intentions (M = 3.066 vs. 2.853, $F(1, 350) = 9.352$, $p = 0.002$), supporting H2. The interaction between expressed arousal and information gap was marginally significant ($F(1, 350) = 3.552$, $p = 0.060$). Pairwise comparisons showed that reading intention did not significantly differ between low and high expressed arousal in the low information gap conditions (M = 3.033 vs. 2.945, $F(1, 350) = 0.970$, $p = 0.325$), but the difference in the high information gap conditions was significant (M = 3.099 vs. 2.762, $F(1, 350) = 10.977$, $p = 0.001$). These results provide support for H3a, and H3b.

Discussion

The first study showed that expressed arousal negatively impacts reading intentions on social media. We also provided evidence that information gap moderates this relationship, such that expressed arousal reduces reading intention for high information gap but not for low information gap. However, this study has several limitations. First, we used images along with the headline in our stimuli. These images might distract subjects' attention away from the news post headline with manipulated expressed arousal. Moreover, the images may also differ in their capability to activate felt arousal which can bring in confounds that might be difficult to control. Therefore, in the next studies we did not use images in the stimuli. Second, this study did not explain the mechanism through which expressed arousal influences reading

intentions. Therefore, in the next studies we measured the mechanisms of felt arousal and source credibility.

STUDIES 2A and 2B

The purpose of Study 2A was to examine the negative effect of expressed arousal on reading intentions when information gap is high. Study 2B was conducted to examine the null effect of reading intentions when information gap is low. We also explored the mechanisms of felt arousal and source credibility in both studies.

Stimulus

We developed stimuli for this study by utilizing news snippets from Study 1. We only used headlines for the high information gap condition. That is, we used headlines that have high information gap for both low and high arousal conditions. We included an additional exclamation mark in the headline, in Study 2A and 2B, to strengthen our manipulation of expressed arousal. For Study 2A, we only presented the news headline. In contrast, for Study 2B we presented the news headline along with the snippet.

Procedure

One hundred seventy-two undergraduate students from a southern U.S. university participated in exchange for course credit for Study 2A and one hundred seventy-one participants were recruited from Amazon Mechanical Turk for Study 2B. The cover stories were identical to the one used in Study 1. However, in these studies we asked participants to evaluate two news posts instead of four. We used two news posts because we were only manipulating expressed arousal with high and low conditions. Expressed arousal and reading intention were measured using the same scale as in Study 1. Felt arousal was measured on seven-point semantic differential scale, using three items adapted from Yin et al. (2017) (e.g., "Very passive/ Very active"). Source credibility was measured on a seven-point Likert scale, using three items adapted from Bhattacherjee and Sanford (2006) (e.g., "The source of the news seems trustworthy").

Results

We examined our manipulation check for expressed arousal using a repeated-measures ANOVA with expressed arousal as a within-subject factor. Results from Study 2A showed that perceived arousal in the low expressed arousal condition was significantly lower than that in the high expressed arousal condition (M = 3.636 vs. 4.804, F(1, 171) = 66.857, p < 0.001). Results from Study 2B indicated that perceived arousal in the low expressed arousal condition was significantly lower than that in the high expressed arousal condition (M = 3.454 vs. 4.745, F(1, 170) = 59.510, p < 0.001) suggesting that our manipulation was successful in both studies.

Next, we tested the main effect of expressed arousal on reading intention, we conducted a repeated-measures ANOVA with reading intentions as the outcome variable. Results from Study 2A revealed that expressed arousal significantly reduced reading intentions (M = 3.378 vs. 3.033, F(1, 171) = 5.200, p = 0.024), supporting H2. Results from Study 2B indicated that arousal had a non-significant impact on reading intentions (M = 3.750 vs. 3.739, F(1, 170) = 0.005, p = 0.942).

To examine the mediating role of felt arousal and source credibility, we conducted a parallel mediation analysis using the SPSS macro MEMORE (Montoya and Hayes 2017). This bootstrapping method is more efficient in testing mediation in a within-subjects design compared to step-by-step approach provided by Judd et al. (2001). We used percentile bootstrap confidence interval method with 5000 samples. The results from Study 2A showed that expressed arousal had a negative effect on source credibility (β = -0.386, t(171) = -3.503, p = 0.001), and source credibility had a positive effect on reading intention (β = 0.439, t(171) = 4.364, p = 0.000). The indirect effect through source credibility was negative and significant (a*b path coefficient = -0.169, 95% CI = [-0.312, -0.053]). In contrast, expressed arousal had a positive effect on felt arousal (β = 0.550, t(171) = 3.614, p = 0.000), and felt arousal had a marginally significant positive effect on reading intention (β = 0.138, t(171) = 1.875, p = 0.063). The indirect effect through felt arousal was not significant at 95% CI (a*b path coefficient = 0.076, 95% CI = [-0.032, 0.165]) or 90% CI (a*b path coefficient = 0.076, 95% CI = [-0.012, 0.149]). The effect size for the indirect effect of source credibility was about two times greater than that of felt arousal. Therefore, these results provide support for H3a.

We conducted a similar mediation analysis for Study 2B because competing mechanisms could cancel each other and explain the non-significant main effect of expressed arousal on reading intentions (Hayes 2009, Lei et al. 2021). The mediation analysis revealed that expressed arousal had a negative effect on source credibility (β = -0.349, t(170) = -3.074, p = 0.002), and source credibility had a positive effect on reading intentions (β = 0.450, t(170) = 5.008, p = 0.000). The indirect effect through source credibility was negative and significant (a*b path coefficient = -0.157, 95% CI = [-0.296, -0.052]). In contrast, expressed arousal had a positive effect on felt arousal (β = 0.294, t(170) = 2.246, p = 0.026), and felt arousal had a positive effect on reading intentions (β = 0.576, t(170) = 7.443, p = 0.000). The indirect effect through felt arousal was positive and significant (a*b path coefficient = 0.170, 95% CI = [0.015, 0.328]). Therefore, these results provide support for H3b.

GENERAL DISCUSSION

Three studies provided converging evidence that expressed arousal negatively influences reading intentions, and that this effect is stronger for high information gap compared to low information gap. Study 1 provided evidence for the

main effect of expressed arousal on reading intentions and the impact of information gap on this relationship. Study 2A provided evidence for the negative mechanism of source credibility. Finally, the results of Study 2B explain the non-significant effect of expressed arousal through competing mechanisms of source credibility and felt arousal.

CONCLUSION

News consumption on social media plays a very important role for news providers. Therefore, it is important to understand the role of emotional expressions in social media. This paper explores how, when and why expressed arousal influences news readership in social media. We hypothesized competing mechanisms to explain the impact of expressed arousal on news readership. In addition, we also explored a context specific boundary condition for the underlying mechanisms. Our study highlights the importance of studying emotional expressions in social media and opens up interesting avenues for future research.

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