Effects of online news comments on Attitude Formation of Readers

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Abstract. This study aims to determine the influence of comments posted online about news on viewers. Opinions posted by news readers via the web often influence the formation of other readers' views. In this paper, we investigate the impressions of news articles under three conditions: (a) presenting a news article only, (b) presenting a news article and comments posted in the comment section of the article by readers, and (c) presenting a news article, comments posted by readers, and the readers' previous comments for other news articles. The result revealed that (1) readers' comments do not affect the impression of the original news article but are more influenced by the perspective of whether the respondent is familiar with the news article, (2) The impression of the comments that viewers agreed on tend to emphasize sincerity, responsibility, and credibility, regardless of the news article's genre, and (3) presenting readers' past comments may influence viewers' evaluation of the information and lead them to form different opinions.

Keywords: attitude formation · news article · information credibility.

1 Introduction

The harm to society caused by the spread of misinformation has become a serious problem with the spread of social media. For example, in 2024, people incited by misinformation attacked a religious institution in the United Kingdom[4]. In this case, information spread on YouTube and Facebook claimed that the suspect in a stabbing attack that killed three girls at a dance class in Northwest England was a recently arrived asylum-seeker and had a name that suggested he was Muslim. The police denied this information the following day, but violent mobs continued throughout the UK. This case demonstrates that misinformation serves not only

[4] https://www.bbc.com/japanese/articles/c3gel0nj9dzo (confirmed 8/Aug/2024)

as the catalyst for online disputes but also as a trigger for significant real-world consequences.

When the primary source of information on social issues and events for the general public was the news published in newspapers and on televisions, the information available to people was limited and generally well-vetted. However, people can now freely upload and transfer information via social media as user-generated content, making the spread of misinformation even more pronounced. Thus, the spread of misinformation has become a current concern in social media research because it causes a decline in the reliability of information on the web.

Social media is not the only place where users can express their opinions. Some news sites operated by mass media and news platforms that provide web news from multiple media outlets have comment sections for readers to express their opinions and impressions of articles. In this study, we call such comments posted by readers of news articles regarding their opinions and views "online comments." The online comment for a news article allows readers to exchange and discuss their opinions on the main topic. Online comments help to understand the news. However, online comments about news can have various influences and cannot be ignored when addressing misinformation.

Although both SNS and online comments are user-generated content, the nature of each content is different: In SNS, conversations and comments between connected accounts are accumulated as a communication log. The primary purpose of using SNS is to reveal oneself or express sympathy for something, and the content often shifts as the conversation progresses. On the other hand, in online comments on a news article, readers interested in a specific news topic will articulate their opinions and information about that topic. Hence, information about specific news items tends to accumulate.

In the comment section of a news article, the reader can easily reference the original article. Therefore, the article and comments may be presented to readers simultaneously. Thus, online comments influence each other and readers who read the news article for the first time. In recent years, it has been reported that comment sections of news articles have been the target of influence operations[16]. While acknowledging the usefulness of online comments, this study is concerned that subjective and biased comments may contribute to the distribution of misinformation. It is essential to clarify the effects of online comments on viewers to take countermeasures against misinformation and ensure the credibility of news.

In this study, we attempt to clarify the impact of opinions posted in comment sections on viewers' understanding of news. By understanding the impact of online comments and designing a system that considers them, we aim to create a reception environment of news that prevents inadvertent misinterpretation of false information and misinformation. This paper investigates the relationship between exposure to news while other people's opinions are available and the formation of impressions of news articles. In addition, to clarify the characteristics of online comments that influence viewers, we investigate the comments that viewers agree with and their impressions of the comments.

2 Related work

2.1 Studies on user postings on the web and the formation of public opinion

Most of the previous studies on public opinion analysis and attitude formation through social media have used social network services (SNS) such as X and Facebook as data sources for analysis, though several studies have analyzed online comments as a collection of opinions about an article[11][15]. These studies have pointed out the possibility that online comments can be an indicator of public opinion perception since around the 2010s. Hyonjin's study examines the impact of online comments on readers' attitudes toward news articles[2]. The study focuses on the tone of the news articles and the agreement of the tone of the comments and investigates the impact of readers' attitude formation and third-party effects[3] from multiple perspectives. The paper points out the possibility that the interactive exchange of opinions through online comment platforms may influence the formation of attitudes. In Japan, there is also a study that discusses the potential of social media as a forum for attitude formation. The above studies indicate that social media were expected to enable the exchange of opinions that transcended social disparities and physical distance and to provide a forum for the formation of attitudes in an environment where information disparities were eliminated. However, public opinion formed on social media today does not necessarily reflect actual public opinion. In fact, a Reuters survey reported that only 7% of peoples surveyed in Japan post their own opinions on social media[9]. If only comments from a limited number of contributors can be viewed, diversity will not be ensured and there are concerns that this may lead to a biased understanding of public opinion by viewers. Considering this point, for social media to function as a forum for attitude formation, it is necessary to improve social media from the perspective of the information distribution environment and enable viewers to examine information from multiple perspectives.

On the other hand, in fields such as computational social science, new issues that have emerged from the enormous social media have been pointed out and have become the research subject. Conventional research has used social media information to observe the process of information distribution problems that occur in social media, such as the spread of false rumors and polarization of opinions, and to analyze ex post facto what phenomena have occurred in the target topic. For example, Toriumi et al. analyze the increase/decrease and spread of emotions in readers' comments during the outbreak of the new coronavirus in 2020 [14]. Tanihara et al. observed social media posts about a sex abuse scandal at an entertainment agency. They considered that the great interest of social media users disrupted the "spiral of silence" [10] in which minorities were prevented from asserting themselves due to social pressure. [13]. This study similarly reports the occurrence of echo chambers in fan communities, which require external pressure, such as media exposure, to resolve.

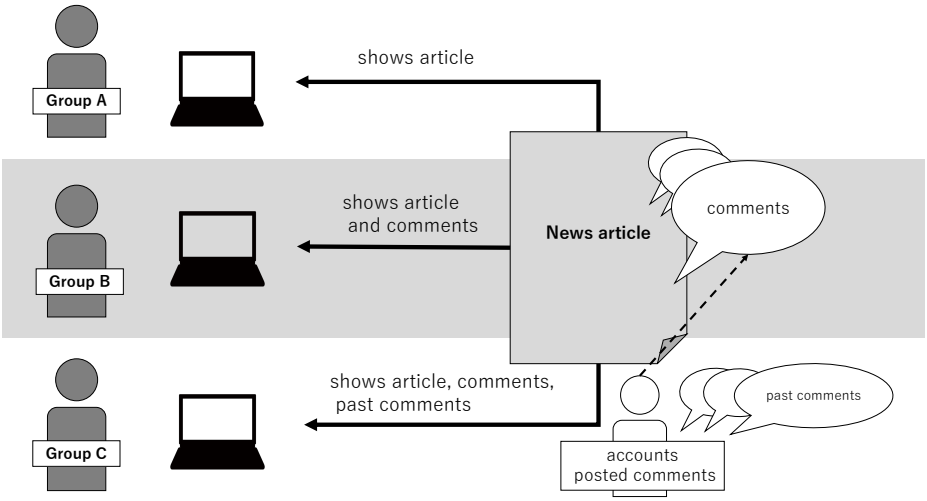

Fig. 1: procedure

2.2 Studies on the influence of comment viewers on news

There have been previous studies on the influence of online comments on web news articles on readers in the U.S. and Korea [12][7]. The study by Lee et al. experimented on the effect of the tone of comments on news articles, and a study focused on how comments are presented to clarify how online comments affect people's perceptions of news articles[7]. In their study, Lee et al. conducted an experiment on the effect of the tone of the comments and a survey focusing on the way the comments were presented in order to clarify how the comments on news articles affect people's perceptions. This research is conducted by collecting the opinions of the experiment participants in advance through a pre-survey, controlling for agreement or disagreement with the participants' opinions, and conducting research and analysis based on measures of public opinion perception, public opinion concordance, opinion polarization, news article concordance, and manipulability of online comments. The study reports that online comments influence readers' perceptions of public opinion and news tone. Eliders et al. also reported that online comments influence public opinion perceptions [4]. They examined the influence of comments on public opinion perceptions in different cultures in Korea and Germany. They found that in both countries, collectivist groups had more viewers who perceived "public opinion to be generally consistent with their views. These research reports indicate that comments on news stories influence viewers' perceptions of the news.

2.3 Positioning of this study

The fact that online comments influence viewers from multiple perspectives has been reported by several existing studies, as indicated in Section 2.2. Most ex-

isting studies focus on surveys on specific current issues or topics and take the approach of questionnaire surveys or ex-post analysis and simulation of the information posted.

However, interfaces and information presentation algorithms may influence the reception of information and the formation of opinions on social media. In fact, Liao et al.'s study on Edward Snowden examines the use of SNSs by party affiliation and reports that social media functions affect the behavior of each party in expressing their opinions[8]. By clarifying the impact of the online information viewing environment on attitude formation, it is possible to examine the requirements that should be met by the interface in forming opinions on social media.

3 Experiments

This experiment aims to clarify the influence of the environment in which the readers can view online comments. The points to be clarified through the experiment are as follows:

(1) Changes in impressions of news articles
(2) Impressions that readers have of comments that they agree with.
(3) Impact of previous postings of the commenting account

For point (1), we observe how the impression of the news article changes between the viewer who reads the news article as is and the viewer who reads the news article while reading online comments. Several existing studies have shown that online comments change the impression of the news. These are mainly based on news articles about political and social issues, such as political attitudes and public opinion perceptions, and the analysis is based on questionnaires tailored to each topic. This paper investigates the impression construct scale for news articles as a measure that can be used for multiple article genres. This impression construct scale allows us to compare the impact of online comments across genres.

For point (2), we clarify the characteristics of online comments that are likely to gain readers' agreement. In the comment sections of web news sites, there is a mechanism to roughly grasp readers' agreement based on indicators such as "number of high ratings" and "number of likes. However, these indicators are easily affected by the time and date of comment posting and comment display algorithms. For this reason, in this paper, we present comments on articles at random and let participants in an experiment select comments and measure their impressions of the selected comments.

For point (3), we observe changes in the impression of the account that posted the comment based on its previous postings. Some web news sites have a function that displays comments posted in the past by the same account based on the information of the account that posted the comment. From this comment history, it is possible to analyze the interests and opinions of the account in question. In this paper, we control groups that present news articles and comments and the

groups that can view past comments and clarify how past comments affect the viewers.

An experiment was conducted to measure changes in impressions of news articles and online comments using comments posted on actual web news sites. The data used in the experiment were collected from the web news platform "Yahoo! News"[5]. The news articles used in the experiment were selected as topics that are expected to generate a variety of opinions and that had at least 100 comments at the time of collection. Articles used for the experiment were "Operation Rafah to Continue for Weeks; Israel to Expand Area?" by Kyodo Tsushin[6](Article Israel) and "Japanese Female Couple Recognized as Refugees by Canadian Government –Persecuted in Japan", by Asahi Shinbun[7](Article Gender). The Article Gender is about two Japanese women who applied for refugee status in Canada on the grounds that they were being persecuted in Japan, and it was accepted. Comments on this article were expected to capture a variety of opinions about how LGBT people are treated in Japan. The Article Israel is about comments made by British Prime Minister Netanyahu in a television interview regarding the Israeli military's ground operations in the Palestinian territories. It was expected that the comments on this article would gather a diversity of opinions, with differences in knowledge about Israeli–Palestinian conflict leading to different perspectives.

The top 20 comments at the time of collection were obtained in the order of "Recommends." This order results from sorting based on the recommendation algorithm of "Yahoo! News" and the number of ratings for each comment. Among the collected comments, references to specific account names in the comments were anonymized. Account names were also anonymized by assigning a serial number, such as "Acc._1," when the comments were presented to the experiment participants.

3.1 Procedure

Figure 1 shows the procedure of the experiment. The participants were divided into three groups: those who viewed only the articles (group A), those who viewed the articles and comments attached to the articles (group B), and those who viewed the articles, comments attached to the articles, and comments posted by other accounts that had commented on the articles (group C). Next, participants in each group were presented with articles and comments. The participants were asked to respond to a questionnaire corresponding to each group based on the information presented to them. The questionnaire was structured as follows:

1. **Perception of the presented news article**
   This is a measure of whether the experimenter is aware of the news articles presented in the experiment. The questionnaire was designed to be answered by a "yes" or "no" response.

[5] https://news.yahoo.co.jp/
[6] https://nordot.app/1163585796541890807?c=39550187727945729(2024/8/5)
[7] https://www.asahi.com/articles/ASS5L26LBS5LUTFL014M.html(2024/8/5)

Table 1: Perception of news article for each session

Article	Session	perception	Group A	Group B	Group C
Article Israel	First session	Yes	104	64	60
		No	96	36	40
	Second Session	Yes	98	90	102
		No	85	78	80
Article gender	First Session	Yes	65	31	41
		No	135	69	59
	Second Session	Yes	40	43	47
		No	143	139	121

2. **Impression of the news article**
   This is constructed based on the impression construct scale of news articles proposed by Kumamoto [6]. The impression construct scale has 38 items with four factors: "positive," "Negative," "Uninteresting," and "Unexpected. Based on this, we constructed six impression structure scales in this experiment. The scale used in the experiment consists of six items: "Pleasant – Sad," "Uninteresting – Interesting," "Unexpected – Expected," "Favorable – Unfavorable," "Reassuring – Anxious," and "Refreshing – Unexpiring." The impression construction scale was evaluated using the 6-point semantic differential method.
3. **Impression of the account that wrote the most agreeable comment**
   This is constructed based on the impression construct scale for social media brand accounts made by Ishida [5]. This scale is an adaptation of Aaker's impression scale for brand image, [1], as an impression construct for Twitter brand accounts. Since the online comments used in this experiment are text-based, it would be possible to use this scale to evaluate the impressions obtained from the text set. The previous study's scale consisted of five items: "humor," "sincerity," "comfort," "friendliness," and "elegance." In this experiment, "trustworthiness" was added to this scale, and the six items were evaluated on a 5-point Likert scale.

The experiment was conducted twice through a crowdsourcing service. Participants' demographics were not controlled for in this experiment. The first experiment included 200 participants in Group A and 100 participants in Groups B and C. Responses were cleansed based on correct answers to confirmation questions and repetition of the same answers. All valid responses were obtained in the first experiment. The second experiment was conducted with 200 participants in each group. The number of valid responses was 183 for Group A, 168 for Group B, and 182 for Group C.

3.2 Result

This chapter describes the results of the experiment conducted in section 3. The distribution of news perceptions for each session is shown in Table 1. The

Table 2: Hellinger distances of impressions between each group per article and between known/unknown groups (excerpts). Bolded items indicate a score of 0.35 or higher.

Evaluation Items	Group A vs Group B	Group B vs Group C	A_unknown vs A_known	B_unknown vs B_known	C_unknown vs C_known	A_unknown vs B_unknown	B_unknown vs C_unknown	B_known vs C_known
Article Israel								
Pleasant–Sad	0.101	0.193	0.251	0.260	**0.401**	0.156	0.169	**0.396**
Uninteresting–Interesting	0.175	0.157	**0.521**	**0.435**	0.311	**0.504**	0.286	0.176
Unexpected–Expected	0.183	0.159	0.267	**0.357**	0.295	0.301	0.337	0.104
Favorable–Unfavorable	0.129	0.293	0.287	0.130	0.229	0.138	0.280	0.322
Reassuring–Anxious	0.105	0.113	0.262	0.129	0.249	0.227	0.066	0.160
Refreshing–Unexpiring	0.121	0.131	0.223	0.208	0.253	0.107	0.201	0.191
Article Gender								
Pleasant–Sad	0.112	0.172	0.190	0.312	**0.367**	0.144	0.287	0.341
Uninteresting–Interesting	0.073	0.117	0.222	**0.407**	0.252	0.053	0.186	**0.477**
Unexpected–Expected	0.143	0.176	0.121	0.174	0.258	0.156	0.117	0.288
Favorable–Unfavorable	0.138	0.092	0.201	0.162	0.213	0.180	0.134	0.127
Reassuring–Anxious	0.089	0.117	0.168	0.184	0.291	0.098	0.187	0.258
Refreshing–Unexpiring	0.081	0.066	0.157	0.263	0.228	0.066	0.099	0.195

impression component scale of the news is shown in Table 2. The mean of the impression values for each group was calculated, and the difference between groups was observed by Hellinger distance. As a result, no significant difference was observed between groups. We calculated the mean of the impression values for each known and unknown group and observed the differences between the groups in the same way. The results showed a difference of more than 0.3 in the "Uninteresting – Interested" or "Unexpected – Expected" items for both groups. In particular, "Uninteresting – Interesting" recorded a score of 0.3 or higher in the comparison of 5 items, and can be considered a item that has a particularly strong influence when comparing known and unknown groups.

The agreement rate of each account for each article is shown in Table 3. The agreement rate was calculated by normalizing the number of votes for each account by the number of participants in the experiment. Next, groups B-C in each news article by article were compared to observe the effect of the presentation of past comments on the accounts. As a result, we observed a maximum difference of 0.067 in the Israel article (see Table 3a). In the gender article (see Table 3b), we observed a maximum difference of 0.100.

The impressions of the comments with which the collaborators in groups B and C agreed are shown in Figure 2. This table graphically shows the number of comments in each group that agreed with each article, normalized by the number of participants in the experiment. The results show that the "responsible," "sincere," and "trustworthy" comments were higher, while the "humorous" and "healing" comments were lower, regardless of the article or group of articles in the experiment.

4 Testing hypotheses using articles from different genres

The results in section 3.2 show three things: (1) The stronger factor influencing the impression of a news article is whether the reader is already familiar

Table 3: Percentage variation in the number of endorsements per article. The number of endorsements for each account was normalized by the number of participants, and the difference was calculated.

(a) Article Israel

	Agreement rate		volatility		
	Group B	Group C	Round 1	Round 2	diff
Acc._i1	0.050	0.060	0.010	0.048	-0.038
Acc._i2	0.080	0.030	-0.050	0.022	-0.072
Acc._i3	0.020	0.090	0.070	0.067	0.003
Acc._i4	0.000	0.030	0.030	0.020	0.010
Acc._i5	0.110	0.050	-0.060	-0.055	-0.005
Acc._i6	0.030	0.030	0.000	0.007	-0.007
Acc._i7	0.150	0.190	0.040	0.004	0.036
Acc._i8	0.010	0.010	0.000	0.018	-0.018
Acc._i9	0.070	0.040	-0.030	0.005	-0.035
Acc._i10	0.050	0.030	-0.020	-0.036	0.016
Acc._i11	0.010	0.000	-0.010	-0.015	0.005
Acc._i12	0.030	0.050	0.020	-0.015	0.035
Acc._i13	0.050	0.050	0.000	-0.030	0.030
Acc._i14	0.090	0.040	-0.050	-0.013	-0.037
Acc._i15	0.060	0.060	0.000	-0.014	0.014
Acc._i16	0.080	0.080	0.000	0.011	-0.011
Acc._i17	0.030	0.050	0.020	0.000	0.020
Acc._i18	0.010	0.020	0.010	0.000	0.010
Acc._i19	0.060	0.070	0.010	-0.047	0.057
Acc._i20	0.010	0.020	0.010	0.024	-0.014

(b) Article Gender

	Agreement rate		volatility		
	Group B	Group C	Round 1	Round 2	diff
Acc._g1	0.000	0.010	0.010	0.075	-0.065
Acc._g2	0.070	0.060	-0.010	0.045	-0.055
Acc._g3	0.100	0.150	0.050	-0.003	0.053
Acc._g4	0.040	0.060	0.020	0.020	0.000
Acc._g5	0.010	0.030	0.020	0.037	-0.017
Acc._g6	0.060	0.050	-0.010	0.005	-0.015
Acc._g7	0.020	0.060	0.040	0.009	0.031
Acc._g8	0.050	0.030	-0.020	0.003	-0.023
Acc._g9	0.030	0.010	-0.020	0.012	-0.032
Acc._g10	0.050	0.120	0.070	-0.001	0.071
Acc._g11	0.100	0.120	0.020	-0.007	0.027
Acc._g12	0.080	0.010	-0.070	-0.029	-0.041
Acc._g13	0.010	0.000	-0.010	-0.010	0.000
Acc._g14	0.030	0.010	-0.020	0.015	-0.035
Acc._g15	0.040	0.070	0.030	-0.035	0.065
Acc._g16	0.150	0.050	-0.100	-0.025	-0.075
Acc._g17	0.050	0.020	-0.030	-0.016	-0.014
Acc._g18	0.080	0.130	0.050	-0.041	0.091
Acc._g19	0.030	0.000	-0.030	-0.032	0.002
Acc._g20	0.000	0.010	0.010	-0.022	0.032

(c) Article Columbus

	Agreement rate		
	Group B	Group C	volatility
Acc._e1	0.077	0.105	0.028
Acc._e2	0.066	0.094	0.028
Acc._e3	0.005	0.055	0.050
Acc._e4	0.066	0.083	0.017
Acc._e5	0.027	0.000	-0.027
Acc._e6	0.011	0.050	0.039
Acc._e7	0.011	0.050	0.039
Acc._e8	0.016	0.006	-0.011
Acc._e9	0.005	0.017	0.011
Acc._e10	0.066	0.050	-0.016
Acc._e11	0.038	0.044	0.006
Acc._e12	0.137	0.122	-0.015
Acc._e13	0.005	0.000	-0.005
Acc._e14	0.060	0.022	-0.038
Acc._e15	0.060	0.033	-0.027
Acc._e16	0.038	0.022	-0.016
Acc._e17	0.011	0.000	-0.011
Acc._e18	0.038	0.050	0.011
Acc._e19	0.066	0.044	-0.021
Acc._e20	0.197	0.155	-0.042

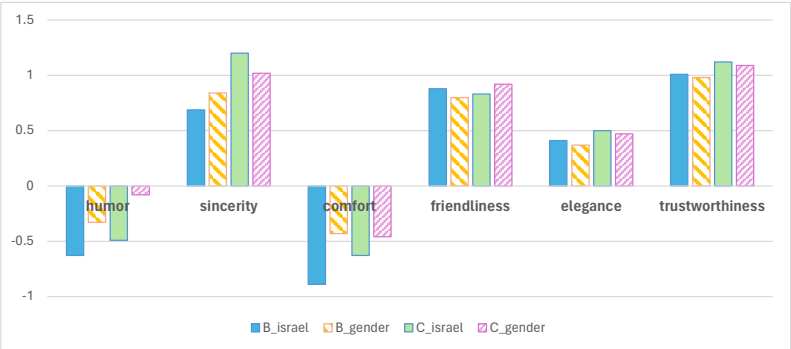

Fig. 2: Impressions of agreeable comment

with the news article, not showing comments, (2) agreeable comments tend to have a common impression regardless of the article or group, and (3) the rate of agreement with comments varies depending on the presentation of past comments. In order to clarify whether these points can be obtained for articles of different genres, an additional experiment was conducted using the same procedure as in Chapter 3. The article used for the experiment was the ORICON NEWS article “Mrs. GREEN APPLE stops releasing a new song ’Columbus’ music video “There were expressions that lacked understanding of the historical and cultural background.”(confirmed August 5, 2024) (Columbus article). The number of valid responses was 193 for Group A, 183 for Group B, and 181 for Group C. There were 200 participants in each group.

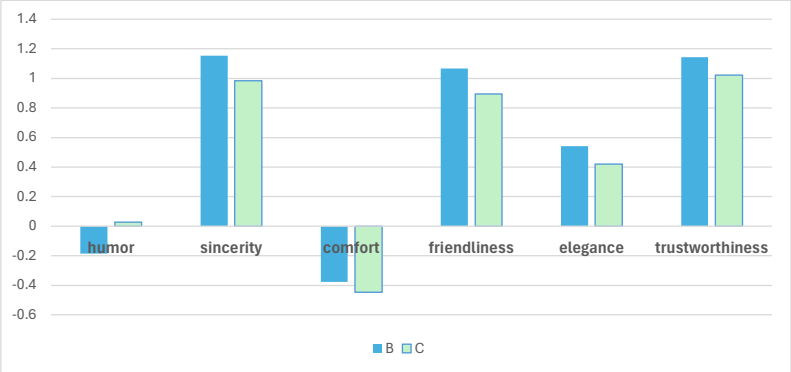

Fig. 3: Impressions of agreeable comments in Article Columbus

The results showed no change in impressions of the presented news articles. The impressions of the comments that the B and C groups agreed with were also higher for the items of "sincerity," "friendliness," and "trustworthiness" (see Figure3). These trends are the same as those shown in Chapter 3.2, suggesting that comments that give the impression of responsibility and sincerity are more likely to be agreed by the viewers. The variation of the agreement rate by the presentation of past comments was also observed in this experiment (see Table 3c). However, the median of the migration rate was -0.008, which is smaller than the variation observed in the articles covered in Chapter 3.2. The variation in the agreement rate due to the presentation of past comments on an account is influenced by multiple factors, such as the genre of the news article and the overall trend of the comment group presented. Further research is needed to clarify the conditions under which shifts in agreement rates occur, targeting a more comprehensive range of news articles.

5 discussion

5.1 The Impact of Online Comments on News Impressions

The results of the experiments in Chapters 3 and 4 indicate that the presence or absence of online comments has a small effect on the impressions received from original news articles and that the effect of the presence or absence of awareness of each news item is more substantial. In particular, the comparison between the known and unknown groups for the "interested–not interested" item showed a difference in impression compared to the other items, regardless of the group. This result may be because the known group had already read articles similar to the topics used in the experiment according to their interests. It is suggested that differences in knowledge and interest in the presented topic lead to differences in impression of news articles. To clarify the influence at the stage of attitude formation for known groups, it is necessary to control the comments based on their contents and observe their influence on attitude formation.

5.2 Presentation of Past Comments and Changes in Agreement Rates

The results of impressions of agreeable comments confirmed the tendency to place more importance on items of friendliness, sincerity, and trustworthiness than on items of humor and healing. These tendencies were the same regardless of the news article or group. This result indicates that readers generally emphasize when evaluating online comments, and it can be assumed that readers need credibility in online comments as a group of information presented in conjunction with news articles. This result suggests that there is a social demand for a mechanism to guarantee the trustworthiness of online comments. In addition, the results suggest that the characteristics of comments that impress people with a sense of responsibility and sincerity can be acquired by observing comments that have received a large number of endorsements.

On the other hand, the results of the variation in the agreement rate by the presentation of past comments revealed that the agreement rate for a comment fluctuates when viewing past comments of the account that posted the comment. This result means that when the viewer agrees with the comment of an article, the reader refers to the past comments of the account that posted the comment. It also shows that the agreement of the same text varies depending on the presentation of previous postings. The presentation of previous postings influences agreement with online comments, indicating the importance of carefully considering how third-party opinions are presented when designing the news reading environment. It should be noted that this result does not directly indicate the pros and cons of presenting past comments. This result can be seen as either reflecting the risk that legitimate claims may be perceived as distorted by past postings, or as indicating that past postings can be used to support the credibility of claims.

5.3 Limitation

One limitation of this paper is the need to clarify the influence of impressions of news articles, while ruling out participants' pre-existing interests. The participants in this experiment showed a significant difference in their perception of the news. As a result, the interest indicator may have had a strong influence on the results. Further experiment with an unknown group is needed to observe the influence of impressions of news articles.

Since only three article genres were used in the experiments in this paper, it is still being determined what article genres would obtain the same results. By investigating whether similar results can be obtained for news topics not covered in this paper, such as articles on "technology" or "sports," it will become clear to what extent the results obtained in this paper can be generalized.

It is also necessary to examine the causes of variation in the rate of agreement by the presentation of past postings. Through the analysis of comments presented in the experiment and past postings, we will observe differences between accounts that gained agreement and those that lost agreement. This analysis will help us to clarify what kind of postings affect the agreement of opinions.

6 conclusion

The purpose of this study was to clarify the influence of online comments given to news articles on viewers. We experimented with comparing the difference in impressions of news articles with and without online comments and the presentation of previous comments from accounts that had posted online comments. As a result, The comparison in terms of the perception of the news articles revealed that there were differences between the known/unknown groups in the "uninteresting–interesting" and "unexpected–expected" items, regardless of the groups.This result indicates that the presentation of the comment does not affect the impression of the original news article but is more influenced by the perspective of whether or not the respondent is familiar with the news article.This result may have been obtained because the known group of visitors knew the news article at the time of the experiment and were already influenced by the comments. In the future, it is necessary to conduct a follow-up experiment to measure impressions of news articles only for the unknown group and verify whether impression changes occur.

The impressions of the comments agreed with by the viewers revealed that the comments agreed with by the viewers emphasized sincerity, responsibility, and credibility, regardless of the group or the news article presented. On the other hand, presenting the account's past comments changed the agreement rate of the comments. This result indicates that presenting past postings as background information on an account may influence viewers' evaluation of the information and lead them to form different opinions.

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