International Journal of Communication 18(2024), 2519-2539 1932–8036/20240005

Perceptions of Opinion Climate in Online Comments and Among the General Public: Examining the Roles of Personal Opinion, Political Knowledge, and Comment Reading

KI DEUK HYUN♦
Akita International University, Japan

NAKWON JUNG
Seoul Women's University, Korea

MIHYE SEO
Sungkyunkwan University, Korea

This study examines whether three factors reported to affect opinion climate perceptions—personal opinion, political knowledge, and comment reading—have equivalent roles in predicting opinion perceptions in the comment sections of news sites and among the public. An online survey of 1,315 respondents was conducted in South Korea, where two popular portal news sites, *Naver* and *Daum*, had contrasting user comment stances toward the Korean president. We found that personal support for the president was positively associated with perceived public support (projection) but was negatively associated with perceived support in the comment sections (hostile opinion perception). Political knowledge was positively related to accurate perceptions of opinion distributions in the comment sections and among the general public. Reading user comments was positively related to perceptions of the opinion climate in the comment section and, to a lesser degree, to the population in line with the comment opinion distributions in the comment sections.

Keywords: hostile media perception, online news, projection, public opinion perception, user comments

With the growing adoption of comment sections on online news platforms, researchers have begun to examine their effects on people's opinions and behaviors. In particular, the potential effects of comments on readers' perceptions of others' opinions have drawn much scholarly attention (e.g., Lee & Jang, 2010; Neubaum & Krämer, 2017; Ross & Dumitrescu, 2019; Soffer & Gordoni, 2020; Winter, Brückner, & Krämer, 2015; Zerback & Fawzi, 2017). This scholarly interest seems justifiable given that public opinion perception

Ki Deuk Hyun: hyun@aiu.ac.jp
Nakwon Jung: paradise@swu.ac.kr
Mihye Seo (corresponding author): mhseo@skku.edu
Date submitted: 2023-05-05

can produce a range of outcomes, including opinion expression in public and political actions (Dvir-Gvirsman, Garrett, & Tsfati, 2018; Noelle-Neumann, 1993).

Findings suggest that user comments accompanying news reports posted on news sites or social networking services (SNSs) can influence readers' perceptions of others' opinions in the direction of the stance of user comments (Lee & Jang, 2010; Neubaum & Krämer, 2017; Ross & Dumitrescu, 2019; Zerback & Fawzi, 2017). The external validity of these findings is a common concern, however, because all research has used experimental methods. Experimental settings that impel subjects to read user comments preferentially manipulated in the distribution of stances about a reported issue do not reflect the natural experience of online news consumption. In online news environments, users can select news outlets based on their preexisting attitudes, which can affect their perceptions of comments and others' opinions (Schulz & Rossler, 2012). Therefore, the findings from previous experimental studies need to be corroborated outside experimental settings. In addition, prior research has seldom addressed whether the same theoretical mechanism explains perceptions of the opinion climate in the specific space where comments are posted and in the population. Whether user comments significantly influence online news users' perceptions of others' opinions has yet to be fully explored.

To complement prior research, we collected survey data to determine the factors related to the inferences of online news users about the opinions of others in a real-world setting. We separately examined and compared how comments related to user perceptions of the opinion climate in the comment section of an online news site and in the offline world. This study focuses on three factors previously reported to predict opinion perceptions—comment readers' opinions (Fields & Schuman, 1976; Gunther, Christen, Liebhart, & Chia, 2001), political knowledge (Dvir-Gvirsman, 2015), and comment reading (Lee & Jang, 2010; Ross & Dumitrescu, 2019; Soffer & Gordoni, 2020; Zerback & Fawzi, 2017).

To test the comment-reading effects, we examined how reading user comments on a particular news site with an imbalanced distribution of partisan stances relates to readers' perceptions of the opinion climate in both the pertinent comment section and the general population, and we considered whether the act of comment reading was associated with accurate or inaccurate perceptions of public opinion. This study leveraged the unique online news environment of South Korea, wherein two portal sites, *Naver* and *Daum*, attract a majority of online news users (Choi, 2022).[1]

About the current research, Korean scholars and news media report that user comments in the comment section of *Daum* are predominantly supportive of Moon Jae-In, the Korean president at the time of this research, and his progressive-leaning party, whereas the user opinions expressed in the comment section of *Naver* are critical toward the president and his party (Bae & Ahn, 2021; "Two Views," 2020).[2] In addition,

[1] According to data from the Reuters Institute for the Study of Journalism (Choi, 2022), more than half of Korean respondents (58%) reported using *Naver* to get news, and one-fourth of them (28%) used *Daum*, for three days or more in the week preceding the survey.

[2] To confirm this partisan contrast in comment opinions, we analyzed the 6,000 most-liked user comments on news reports related to the president and his administration's actions and policies from the two portals. The time frame for data collection was February 21–27, 2019, one week before our online survey. Two trained coders analyzed the slants of the evaluations of the president and his administration, and a satisfactory level of inter-

comments critical of the president tend to get overwhelmingly more approval from other users on *Naver* than comments supportive of the president. In contrast, supportive comments receive more approval on *Daum* (Jung & Kim, 2020). This contrast in opinion stances toward the president in the two comment sections offers a natural setting to determine whether the act of reading user comments on sites with opposing comment opinion distributions can affect news consumers' estimation of the opinions of others in the respective comment sections and the general public and to determine whether it relates to their perception accuracy.

Perception of Others' Opinions Among the Public and User Comment Sections

Many news organizations have news comment sections on their websites or SNS accounts where users can leave their opinions about news stories and interact with other users through interactive features, such as like and dislike buttons and replies (Stroud, Scacco, & Curry, 2016). As user commenting has become an integral part of online news services, researchers have explored user comments from various perspectives. One line of research has focused on the potential of user comments to encourage citizen discussions on public issues. Some scholars expect citizen commenting to facilitate public deliberation by allowing many people to openly and efficiently participate in discussions and interact with one another (Manosevitch & Walker, 2009; Rowe, 2015). Content analyses, however, have documented that user comments fall short of that deliberative ideal. Online commenting reveals significant incivility, such as name-calling, discrimination, and threats (Coe, Kenski, & Rains, 2014), and hostile emotions such as anger, hate, and contempt (Humprecht, Hellmueller, & Lischka, 2020), and it often lacks deliberative features such as argumentative discussion (Ruiz et al., 2011) and provision of evidence (Stroud, Scacco, Muddiman, & Curry, 2015).

Aside from the opinion quality in user comment sections, scholars have investigated the effects of online commenting on readers' assessments of others' opinions in a comment space and among the general public (Lee & Jang, 2010; Neubaum & Krämer, 2017; Ross & Dumitrescu, 2019; Soffer & Gordoni, 2020; Winter et al., 2015; Zerback & Fawzi, 2017). In Korea, where the present study was conducted, such assumed comment effects raised practical and policy issues related to regulating user comments. For example, concerns have been raised about partisan commenters' attempts to mislead online public opinion by manipulating comment popularity on news sites. These worries escalated when a group of bloggers was convicted of fabricating comment popularity on online news sites during the presidential campaign in 2017. Using special computer software, they created numerous user comments and millions of recommendations to induce positive public sentiment toward the presidential candidate they supported (Choe, 2018). Such incidents activated a discussion about user comment regulation, including the introduction of mandatory real-name systems and self-regulation by major news portal sites.

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coder reliability was obtained (Cohen's Kappa = 0.93). As expected, comments posted on *Naver* were overwhelmingly more negative (n = 4,097, 89.5%) toward President Moon and his administration than those posted on *Daum* (n = 2,787, 40.4%). Also, in *Naver*, anti-administration comments received significantly more net likes (number of likes minus number of dislikes) (net likes = 332,474) than pro-administration comments (net likes = 21,011). Meanwhile, on *Daum*, pro-administration comments drew significantly more net likes (net likes = 531,975) than anti-administration comments (net likes = 32,795). The ratio of net likes on pro- to anti-administration comments was 1 to 15.8 for *Naver* and 16.2 to 1 for *Daum*.

Despite debates about the potentially negative influence of user comments that could mislead and distort public opinion, it has yet to be determined whether user comments affect people's perceptions of others' opinions outside experimental settings. Moreover, prior research has rarely compared the cognitive processes in people's perceptions of others' opinions in online spaces where user comments are posted with their perceptions of general public opinion. If users' perceptual processes differ depending on the target groups of others, the inquiry into whether user comments affect the perception of public opinion should be examined with further caution. It is inconclusive whether opinion distribution in a particular comment section serves as a cue in estimating public opinion while controlling for other factors known to be related to opinion climate perceptions.

In this regard, prior research suggests that the perception of others' opinions is a complex process that involves personal opinion (Fields & Schuman, 1976; Gunther & Christen, 2002), cognitive ability (Dvir-Gvirsman, 2015), and the availability of communicative cues (Tsfati, Stroud, & Chotiner, 2014; Wojcieszak & Rojas, 2011). This research focuses on three factors previously reported to affect opinion perceptions—comment readers' own opinions, political knowledge, and frequency of comment reading. Below, we review how each factor can affect online news readers' estimations of others' opinions in a comment section and in the general population.

Personal Opinion and Opinion Perception

Studies have found that personal opinion affects the assessment of others' opinions. The psychological concept of projection notes that people tend to impose their own opinions on others and, in doing so, tend to believe that others have opinions similar to their own (Fields & Schuman, 1976; Ross, Greene, & House, 1977). Projection at least partially occurs for motivational reasons, such as enhancing one's self-image and defending one's ego (Marks & Miller, 1987). People who hold strong opinions might have a greater projection tendency because they are particularly motivated to justify their position as correct or appropriate. Prior research offers some evidence supporting this conjecture, showing that people with strong opinions perceived more strongly that others would share their opinions than did people with moderate opinions (Gunther & Christen, 2002). Given that projection tendencies have been consistent across various situations (Marks & Miller, 1987), it can be predicted that strong partisans are more likely to believe that others have opinions similar to their own. Furthermore, this projection tendency could enhance misperceptions of actual public opinion distributions because strong partisans overestimate the prevalence of their own views among the general public. Therefore, the following two hypotheses are proposed:

H1: The more positive an individual is toward the president's job performance, the more strongly that person will perceive that public opinion toward the president is positive.

H2: The strength of personal opinion toward the president's job performance is positively related to misperceptions of public opinion about the president's job performance.

Although projection explains how people assess public opinion based on their own opinions, it is unclear whether projection colors perceptions of opinion distribution in user comment spaces. If projection is operable in user comment spaces, then people are likely to perceive comment opinion dispersal to be consistent with their own views. However, research based on hostile media perception (HMP) suggests an alternative possibility:

When partisans infer others' opinions from news media, they might perceive the opinion climate to be hostile to their own position (Gunther et al., 2001). Notably, Gunther and Schmitt (2004) proposed that HMP is more likely to occur with news stories than with non-news formats. They found that the participants in their experiments perceived a slant against their own positions when the stimulus content was attributed to news media, but they did not have those perceptions when the same content was attributed to student essays. They attributed these differential perceptions to the perceived *reach* of the information. That is, when people believe that information reaches a mass audience—such as in a news report—and is likely to influence numerous others, they tend to use defensive information-processing mechanisms, causing HMP.

When reading user comments, readers clearly see that the comments are not regular news stories. In online news environments, however, readers might believe that user comments reach as many people as the news articles themselves, exerting a comparable influence on others' opinions (Soffer, 2019). Indirect evidence supports that presumed reach or influence is more important than communication format in causing HMP online. Kim (2015) found HMP toward the same message delivered in different channels—through a traditional news outlet and a blog. The research concluded that the blog, while not a traditional platform for news delivery, could cause HMP if users perceived it to be as far-reaching and influential as traditional news media.

In Korea, most people tend to believe that user comments influence comment readers' opinions. In a survey (Lee, 2018), the majority of respondents reported a belief that user comments affect readers' opinions (51%), whereas fewer respondents stated that reading comments did not affect user views (19%). In addition, about 41% of people answered that user comments exert a negative influence, whereas only 11% responded that user comments have a positive influence (Lee, 2018). Given critical attitudes toward the seemingly powerful and harmful effects of user comments, we expect many people to perceive partisan hostility in the opinion climate of comment sections on media channels, regardless of the actual distribution of the opinions therein. Accordingly, the following hypothesis is suggested:

H3: Personal opinion about the president's job performance is negatively related to opinion perception about the president's job performance in user comment sections.

Political Knowledge and Opinion Perception

User comments about politics can be considered a form of political communication, and people who process political information effectively might also perceive the direction of user comments in comment sections with relatively high accuracy. Studies have found that those who are knowledgeable about politics tend to recall more political information, such as current news reports (Price & Zaller, 1993), and to recognize candidates' positions during campaigns more accurately (Brians & Wattenberg, 1996) than those without much political knowledge. Prior research has also demonstrated that cognitive ability is closely associated with the accuracy of perception (Dvir-Gvirsman, 2015; Thompson, Pennycook, Trippas, & Evans, 2018). Furthermore, politically informed people are less likely to rely on personal experience when making political judgments (Mondak, Mutz, & Huckfeldt, 1996) and more likely to use information inconsistent with their preexisting beliefs, making them less likely than others to be swayed by prior positions (Fiske, Kinder, & Larter, 1983).

Based on prior research, we assume that knowledgeable people are more likely to assess opinion dispersal in comment spaces in the direction of the actual comment distribution. We also expected that political knowledge would potentially reduce individuals' projection tendencies, in turn reducing misperceptions of public opinion. Therefore, the following hypotheses are proposed:

H4: Political knowledge is positively associated with opinion perceptions about the president's job performance in comment sections in line with the direction of comment opinion distributions in the comment sections.

H5: Political knowledge is negatively associated with misperceptions of public opinion.

User Comment Reading and Opinion Perception

User comments posted as reactions to online news articles can function as opinion cues that readers of comments can use to scan others' opinions in a comment sphere and even in the general population. In interviews, comment readers from Israel often reported that they read user comments to monitor the opinion climate (Soffer, 2019). Research by Neubaum and Krämer (2017) found that fear of isolation was positively related to attention to user comments, which indirectly shows that people rely on user comments as a way to gauge others' opinions. Moreover, the features of user comment sections on news sites and SNSs can facilitate comment readers' inferences about other people's opinions. Many online news sites and SNSs allow users to react to comments with "likes" or "dislikes," which can signal the comment's popularity to readers (Lee & Jang, 2010; Neubaum & Krämer, 2017; Winter et al., 2015). Similarly, on the two portal sites examined herein, comment readers can express their agreement with or recommendation of a particular comment. Moreover, the two comment sections allow users to see user comments in the order of the number of likes or recommendations. Accordingly, comment readers might judge the overall opinion climate within a comment sphere and beyond based on the distribution of comments supporting or objecting to a particular view, together with summary indicators of the popularity of such comments.

Researchers explain the potential effects of user comments on opinion perception in light of exemplar and exemplification theory (Lee & Jang, 2010; Neubaum & Krämer, 2017; Ross & Dumitrescu, 2019; Winter et al., 2015; Zerback & Fawzi, 2017). An *exemplar* refers to a specific case or example that represents a larger category or phenomenon, and opinion exemplars can function as cognitive shortcuts for generalizing and estimating others' views (Zillmann, 2002). News media often present opinion exemplars to illustrate an issue or a topic covered in a news report, such as interviews with ordinary citizens on the street. Typically, these exemplars are effective in influencing audiences' perceptions of public opinion (Perry & Gonzenbach, 2000; Zillmann & Brosius, 2000). Prior research found that exemplars in the media exerted an even stronger influence than base-rate information (e.g., poll results), that is, the more accurate representation of public opinion (Beckers, 2019; Daschmann, 2000). This strong exemplar influence has been attributed to its vivid and concrete features, which facilitate the processing and recall of information contained in exemplars when making judgments of others' opinions (Brosius & Bathelt, 1994; Zillmann & Brosius, 2000).

As with exemplars in a news report, user comments that emphasize personal accounts of specific topics in news stories might act as opinion cues for readers to make inferences about others' opinions. Frequent encounters with particular exemplars increase their influence on the generalization of larger categories (Zillmann, 2002), and likewise, frequent exposure to user comments with a particular viewpoint is expected to accentuate the influence of those comments on the judgment of others' opinions (Zerback & Fawzi, 2017). Experiment-based research supports this prediction: The distribution of opposing viewpoints (e.g., pro-position vs. con-position about an issue presented in a one-sided ratio) expressed in user comments has been shown to affect opinion estimates in the expected direction (Lee & Jang, 2010; Ross & Dumitrescu, 2019; Soffer & Gordoni, 2020). Furthermore, Zerback and Fawzi (2017) discovered that comment valence and frequency interacted to influence the estimation of others' opinions. When user comments posted along with video news on Facebook were unanimous in valence—either only positive or only negative comments about an issue—participants in an experimental condition involving more comments perceived others' opinions to be more in line with the comment position than participants who saw fewer comments.

However, comment effects on the perceptions of others' opinions have been shown to vary depending on the *others*. Previous studies have consistently shown that the valence of user comments influences estimations of the opinions of others who use online platforms where the comments are posted. On the other hand, comment effects on estimations of general public opinion have been shown to be absent (Winter et al., 2015), marginal (Zerback & Fawzi, 2017), or weaker than the effects on opinion estimation of smaller groups, such as users of the Internet or the SNS platform where the comments are posted (Neubaum & Krämer, 2017; Ross & Dumitrescu, 2019).

Scholars have explained these differential comment effects in light of the assumed similarity between commenters and the target groups of others. Zillmann and Brosius (2000) proposed that exemplar effects increase with an increased similarity between the exemplar and the exemplified. Based on this idea, Zerback and Fawzi (2017) predicted that the effects of user comments posted on Facebook would be stronger for estimates of online public opinion than for public opinion in the general population—which was supported by their study—because the presumed similarity of comment readers with commenters online is likely to be greater than that with the general public. Similarly, Ross and Dumitrescu (2019) discovered that the effects of the distribution of Twitter exemplars—Twitter users' comments on an online news report about a certain topic—were more pronounced for the opinion estimation of other Twitter users than for the opinion estimation of the general public.

Putting aside differences in assumed similarity, it is obvious that more factors are involved in the assessment of general public opinion than in the estimation of opinion in narrowly focused platforms, such as the user comment sections of certain news sites. In the spiral of silence theory, Noelle-Neumann (1993) suggested that news media and social contacts are two major sources on which people rely to monitor public opinion. A body of research has documented how the use of news media and communication networks, both online and offline, affects individuals' assessments of public opinion (Dvir-Gvirsman, 2015; Tsfati et al., 2014; Wojcieszak & Price, 2009; Wojcieszak & Rojas, 2011). User comments on news sites are only one in a set of diverse sources that constitute a person's communicative environment. Accordingly, the comment effects on opinion estimations beyond the comment sphere should be more limited than those on opinion estimations within a comment section. On the other hand, frequent comment readers should be able to more accurately

judge the opinion climate in any particular user comment section that is a much more confined and specific communication setting. Therefore, the following hypotheses about the estimation of others' opinions in user comment sections and a research question about general public opinion estimation are established:

H6: Comment reading is positively associated with opinion perceptions about the president's job performance in user comment sections in the direction of comment opinion distributions in these comment sections.

RQ1: Is comment reading associated with perceptions of general public opinion?

One concern about user comments is that they can distort people's perceptions of public opinion, even if they do not necessarily represent general public opinion (Soffer & Gordoni, 2020). This concern is especially strong in Korea, where fabricators of user comment popularity have been identified and convicted in court (Choe, 2018). No research has been conducted to determine whether exposure to one-sided user comment sections in partisan opinion distribution affects the accuracy of people's opinion perceptions. Therefore, the following research question is posed:

RQ2: Does comment reading relate to misperceptions of general public opinion?

Figure 1 summarizes the hypotheses and research questions proposed in this study.

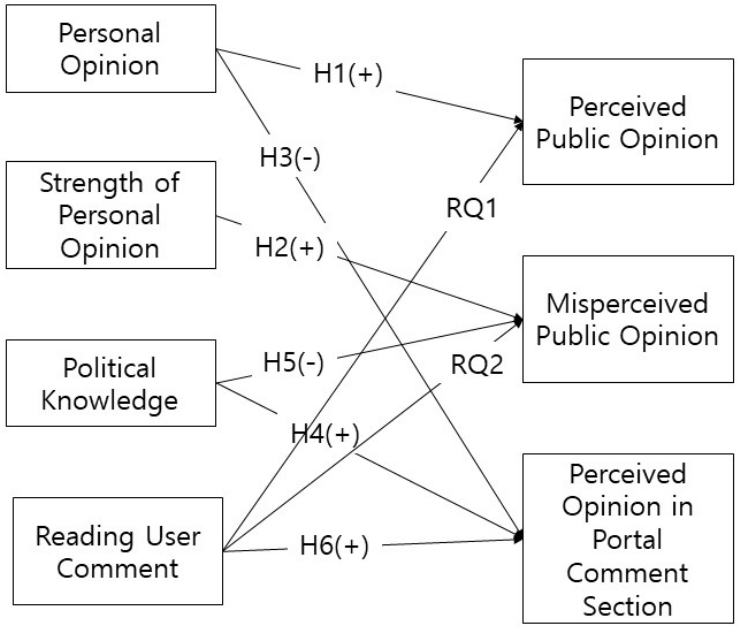

Figure 1. Summary of research hypotheses and research questions.

Methods

Data

The data in this study were collected through a national online survey conducted in South Korea. Hankook Research, a survey company with about one million online panels, was hired. The company randomly e-mailed panel members eligible for participation and offered compensation (e.g., cash or coupons) to the study participants. We set quotas for gender and specific age ranges by region based on census data. Among a sample of 1,600 respondents, we selected respondents who reported using either *Naver* or *Daum* as their main sites for online news consumption. The final sample size was 1,315 individuals, composed of 49.7% male respondents with an average age of 42.82 years (*SD* = 12.36). In terms of education level, 54.3% of the sample had some college education or a bachelor's degree, 18.2% had a two-year college degree, and 15% had some high school or lower level of education. The median monthly household income of respondents was between 3,500,000 and 3,999,999 won.

Measures

Personal Opinion

Personal opinion about the president was measured by asking respondents to indicate their level of presidential approval or disapproval. On a seven-point scale (1 = doing very poorly, 7 = doing very well), respondents were asked to evaluate the president's job performance (*M* = 4.03, *SD* = 1.58).

Strength of Personal Opinion

Opinion strength was measured by recoding the personal opinion measure above. Strong approval or disapproval of the president's job performance was recoded as 4, moderate approval or disapproval was recoded as 3, weak approval or disapproval was recoded as 2, and a neutral position was recoded as 1. The strength of personal opinion scores ranged from 1 to 4 (1 = weak personal opinion, 4 = strong personal opinion), with larger numbers indicating that respondents held stronger personal opinions about the president (*M* = 2.24, *SD* = 0.97).

Political Knowledge

Political knowledge was measured by asking respondents four related questions. Each correct answer was coded as 1, and the wrong answers were coded as 0. An index for political knowledge was created by adding the number of correct answers to each of the four political knowledge questions (*M* = 2.72, *SD* = 1.19).

Reading User Comments on Portal News Sites

Questions were asked to gauge how often respondents read user comments on news about politics and governmental activities posted on the two portal sites. Using a seven-point scale (1 = never, 7 =

always), respondents reported how often they read user comments on *Naver* (M = 4.41, SD = 1.80) and *Daum* (M = 3.70, SD = 1.90).

Perceived Public Opinion

Perceptions of public opinion were measured by asking respondents to assess their perceptions about what percentage of the public would report approval of the president's job performance, ranging between 0 and 100 percent. The exact percentage reported by each respondent was used as a measure of their perception of public opinion (M = 46.85, SD = 14.84).

Misperceived Public Opinion

Misperception of public opinion was developed based on the difference between perceived public opinion and actual public opinion. Actual public evaluation of the president's job performance was drawn from nationwide public opinion polls conducted by the Gallup Korea Research Institute during the weeks of data collection. The accurate percentage of the general public that approved of the president was 47.5%. Accordingly, misperceived public opinion about the president's job performance was calculated by first subtracting the perceived public opinion from the accurate public opinion and then calculating the absolute score of the difference (M = 11.82, SD = 8.98, Min = 0.5, Max = 47.50).

Perceived Opinion Climate in User Comment Sections

To assess the perceived climate in the user comment sections of online portal sites, respondents were asked about the overall opinion climate relating to the evaluation of the president's job performance in the comment sections of *Naver* and *Daum*. On a seven-point scale (ranging from 1 = absolute majority is negative about the president's job performance to 7 = absolute majority is supportive of the president's job performance), respondents reported their perceptions of the opinion climate in the comment section of each portal site (M = 3.32, SD = 1.49 in *Naver*; M = 4.22, SD = 1.28 in *Daum*).

Control Variables

Along with the four demographic variables (i.e., age, gender, education level, and monthly household income) specified in the data section above, political interest and two media use variables were measured for control purposes. Political interest was measured by asking respondents to report their level of political interest on a seven-point scale (1 = not at all interested, 7 = very interested; M = 4.44, SD = 1.32). Main portal use was dummy coded with *Naver* as 1 and *Daum* as 0. Of the total respondents, 73.6% reported using *Naver* as their main portal service for news consumption. News media use was measured by asking respondents to indicate their use of news media within the preceding week. Specifically, the respondents' use of four types of media (i.e., newspaper or newspaper websites, television (TV) news or TV news websites, social media, and portal news sites) was measured on a seven-point scale (1 = never used, 7 = used daily). Subsequently, scores for the four news media use variables were averaged to build a composite index of media use (α = .60, M = 4.38, SD = 1.25).

Results

To test the proposed hypotheses and research questions, multiple regression analyses were conducted. The first two hypotheses address the relationship between personal opinion (both direction and strength) and perceived public opinion (both general public opinion perceptions and misperceived public opinion). These two hypotheses were tested using two separate multiple regression models, both of which included the four demographic variables and the other control variables described in the control variable section above.

A positive relationship between personal opinion and perceived public opinion was predicted in H1. As shown in Table 1, those with more positive opinions about the president tended to perceive greater positivity in general public opinions toward the president (β = .617, p < .001). Therefore, H1 was supported, indicating a positive association between personal opinion and the perception of public opinion.

Table 1. Multiple Regression Results Explaining Perceived Public Opinion.

	Perceived Public Opinion		
	β	*β*	*β*
Control			
Gender	.010	.013	.039
Age	.049*	.040	−.021
Education	.029	.029	.009
Income	−.021	−.020	−.016
Political interest	−.055*	−.052	.037
Political knowledge	−.003	−.005	.019
News use	−.025	−.022	−.033
Main portal use	−.025	−.016	−.101**
Personal opinion	.617***	.612***	—
Strength of personal opinion	.013	.014	—
Reading *Naver* comments	—	−.036	−.151***
Reading *Daum* comments	—	.017	.147***
R^2	.380	.381	.052

Note. *p < .05, **p < .01, ***p < .001; gender was dummy coded (female = 1); main portal service was dummy coded (1=*Naver*).

H2 proposed that the strength of personal opinion would be positively associated with misperceptions of public opinion. H2 was tested by conducting a multiple regression model with misperceived public opinion as the dependent variable. As shown in Table 2, there was a positive association between the strength of personal opinions and misperceptions of public opinion (β =.333, p < .001). Therefore, H2 was

also supported: Those with stronger personal opinions were more likely than others to misperceive the opinions of the general public.

Table 2. Multiple Regression Results Explaining Misperceived Public Opinion.

	Misperceived Public Opinion		
	β	*β*	*β*
Control			
Gender	.006	.002	−.006
Age	−.091**	−.078**	−.053
Education	−.084**	−.085**	−.070*
Income	.003	.003	.014
Political interest	.024	.017	.104**
Political knowledge	−.144***	−.142***	−.126***
News use	.033	.028	.010
Main portal use	.023	.013	.012
Personal opinion	−.092**	−.086**	—
Strength of personal opinion	.333***	.331***	—
Reading *Naver* comments	—	.050	.090**
Reading *Daum* comments	—	−.014	−.069*
R^2	.148	.149	.040

Note. *p < .05, **p < .01, ***p < .001; gender was dummy coded (female = 1); main portal service was dummy coded (1=*Naver*).

H3 predicted a negative association between personal opinions about the president's job performance and the perceived online opinion climate about the president in the comment sections of both portal news sites. The results are presented in Table 3. As predicted, there was a negative association between personal opinion and perceived opinion climate in the comment section of *Naver* (β = −.069, p < .05), indicating hostile perceptions in the online public opinion climate. Likewise, personal opinions about the president and the perceived online climate in the comment section of *Daum* were negatively associated (β = −.074, p < .01). Thus, H3 was supported regarding hostile online opinion perceptions in the comment sections of online news.

Table 3. Multiple Regression Results Explaining Perceived Opinion in Portal Comment Sections.

	Perceived *Naver* Comment Section Opinion		Perceived *Daum* Comment Section Opinion	
	β	*β*	*β*	*β*
Control				
Gender	−.038	−.029	−.092**	−.101***
Age	.309***	.286***	.051	.063*
Education	−.015	−.013	.026	.021
Income	−.030	−.030	.018	.020
Political interest	−.093**	−.077*	.136***	.109**
Political knowledge	−.065*	−.068*	.024	.024
News use	.099**	.110***	−.047	−.065*
Main portal use	.016	.026	−.196***	−.160***
Personal opinion	−.062*	−.069*	−.058*	−.074**
Strength of personal opinion	−.094**	−.094**	.017	.025
Reading *Naver* comments	—	−.083**	—	—
Reading *Daum* comments	—	—	—	.143***
R^2	.115	.121	.092	.109

Note. *p < .05, **p < .01, ***p < .001; gender was dummy coded (female = 1); main portal service was dummy coded (1=*Naver*).

H4 predicted that political knowledge would be positively associated with opinion perceptions in the comment sections about the president's job performance in the comment opinion distributions of these comment sections. As discussed in our literature review, *Naver's* comment section was more critical toward the president, while *Daum*'s comment section was more favorable toward the president. Therefore, according to H4, those with high levels of political knowledge would perceive *Naver*'s online public opinions to be more critical toward the president, and *Daum*'s online public opinions would be more favorable toward the president. As shown in Table 3, political knowledge was negatively associated with perceived online public opinions toward the president in the comment section of *Naver* (β = −.065, p < .05). However, there was no significant association between political knowledge and perceived online public opinions in the comment section of *Daum* (β = .024, *n.s.*). Thus, H4 was only partially supported.

H5 predicted a negative association between political knowledge and misperceptions of the opinions of the general public. As indicated in Table 2, those with high levels of political knowledge were less likely than others to misperceive public opinion (β = −.142, p < .001). Therefore, H5 was supported.

H6 expected that the act of comment reading would be positively associated with opinion perception about the president's job performance in the user comment sections of both online news sites in the direction of the comment opinion distributions in the comment sections. The results are summarized in Table 3. As predicted, the act of reading the comment section of *Naver* was associated with perceived opinion in *Naver*'s

comment section (β = −.083, p < .01), which is also consistent with the online opinion distribution toward the president in the comment section of *Naver*. Similarly, reading *Daum*'s comment section was positively associated with perceived opinion in *Daum*'s comment section (β = .143, p < .001), which, again, is consistent with the prediction. Thus, H6 was supported.

RQ 1 and 2 inquired about relationships between the act of comment reading and perceived and misperceived public opinion. RQ1 asked whether comment reading would relate to perceptions of general public opinion. As shown in Table 1, neither *Naver* comment reading (β = −.036, *n.s.*) nor *Daum* comment reading (β = .017, *n.s.*) was associated with perceived public opinion. However, the act of reading comment sections was significantly associated with perceived public opinion when we did not control for personal opinion, which is consistent with most experimental approaches used to test the effects of reading online comment sections on perceived public opinion. Those who read the comment section of *Naver* (β = −.151, p < .001) tended to perceive less favorability toward the president's job performance in general public opinions. This is consistent with the online opinion climate in *Naver*'s comment section. Similarly, those who read the comment section of *Daum* tended to perceive more favorability toward the president's job performance in general public opinion (β = .147, p < .001), which is consistent with the online public opinion distribution of *Daum*.

Finally, RQ2 asked about the relationship between comment reading and misperceptions of actual public opinion in the population. As indicated in Table 2, reading comment sections was not found to be associated with misperceptions of general public opinion. Reading the comment sections of neither *Naver* (β = .050, *n.s.*) nor *Daum* (β = −.014, *n.s.*) was associated with misperceptions of public opinion distribution. However, the two reading variables were significant when personal opinion and opinion strength were not included in the regression equation (*Naver* reading, β = .090, p < .01; *Daum* reading, β = −.069, p < .05).

Discussion

In this study, we examined whether the same theoretical mechanism explains the perceptions of others' opinions in specific user comment spheres and in the general population. We tested whether personal opinion, political knowledge, and comment reading play equivalent roles in opinion climate perceptions of the comment sections of popular online news sites and among the general public. Using survey data, we attempted to corroborate previous experimental reports that user comments affect people's perceptions of the opinion climates both on online platforms where comments are posted and among the general public.

First, the findings of this study suggest that the processes driving opinion perceptions in user comment-based spheres and the offline world cannot be equated. In particular, an individual's personal opinion (i.e., about the president's job performance) was shown to relate to the perceptions of the two target groups of *others* in opposite directions. We discovered projection tendencies in estimates of the general public opinion, whereas the process was more similar to the HMP phenomenon when estimating opinions in comment sections. We interpret this finding to indicate that the presumed reach and influence of user comments among the Korean public might have caused the defensive processing of information to be more akin to contrast bias than to assimilation bias (cf. McLeod, Wise, & Perryman, 2017; Perloff, 2015), which can explain hostile opinion perceptions in user comment sections.

Our data also suggest that opinion perceptions might be shaped by two contrasting factors or processes: Personal opinion, which causes biased information processing, and cognitive ability, considered in this study as political knowledge, which promotes accurate processing of opinion cues such as user comments. Whereas personal opinion can skew judgments of others' opinions from the actual opinion distribution in user comment sections and the general population, cognitive ability might promote a relatively accurate assessment of opinion distributions in both spheres.

Furthermore, we found that exposure to user comments can affect opinion climate perceptions in both the comment sections and the population. The act of reading comments posted on two portal news sites was shown to be positively related to opinion perceptions, in line with the actual opinion distributions in each of the two comment sections. Increased accessibility to one-sided user comments with a partisan stance might have facilitated the recall of opinion directions in user comments (Zerback & Fawzi, 2017). Also, reading comments on the two sites was related to perceived public opinion in the same direction as the prevailing opinions of the two comment sections, suggesting that user comments can have exemplification effects (Lee & Jang, 2010; Neubaum & Krämer, 2017; Winter et al., 2015). It should be emphasized, however, that such comment effects on public opinion perception disappeared when personal opinion was controlled.

The differential effects of comment reading on opinion climate perceptions in different target groups align with the results of prior experimental tests (Neubaum & Krämer, 2017; Ross & Dumitrescu, 2019; Zerback & Fawzi, 2017). Scholars have attributed these differential effects to different levels of assumed similarity between comment readers and the target groups of others. However, our data suggest that one additional factor could be weakening the influence of comment effects on perceptions of opinions in the general public. Personal opinion can increase hostile opinion perception of user comments, which could dilute the effects of reading comments in comment sections that are one-sided in terms of valence.

Another noteworthy finding is that comment reading was not related to misperceptions of public opinion. There are concerns that user comments can distort readers' public opinion perceptions because the opinion distribution in a comment sphere does not represent actual public opinion (Soffer & Gordoni, 2020). The two comment sections analyzed in this study are excellent examples of comment opinion distributions that are far from actual public opinion distributions. The insignificant comment effects observed in this study can be taken as grounds for relief among people who worry about the negative consequences of user comments on democratic debates. Along these lines, Soffer (2019) reported that some comment users in Israel pointed out the nonrepresentative nature of user comments, worrying about the potential manipulation of the comment sphere. Such negative views about user comments have also been reported by the Korean public (Lee, 2018) and could lead online news users to rely less on user comments when making judgments about public opinion, thereby minimizing the influence of user comments on misperceptions of public opinion.

Taken together, the current research contributes to the existing literature by illuminating the differences in the estimation of others' opinions between commenting spaces and among the general public. Scholars have claimed that people may differentiate opinion climates online and among the general public (Schulz & Rossler, 2012; Zerback & Fawzi, 2017). Our analysis not only supports this speculation but also

reveals that personal opinion plays a key role in differences in opinion perceptions. Our results confirm the findings of prior experiments that have demonstrated comment effects on opinion perceptions (Lee & Jang, 2010; Neubaum & Krämer, 2017; Ross & Dumitrescu, 2019; Winter et al., 2015). Based on the survey data, the current research partially addresses the issues of external validity in these previous studies. At the same time, our data provide evidence that the influence of reading user comments on public opinion estimation may be much weaker than that of personal opinion. This result requires caution when interpreting comment effects in real-world settings.

Our findings have some important implications for addressing potentially harmful user comments. Because user comments often show negative features, such as incivility and hostility, methods of controlling toxic comments have been debated in the journalistic community (Gardiner et al., 2016). Furthermore, in Korea, political elites and the public have been worried about the fabrication of comment popularity intended to affect public opinion in favor of a particular social and political group. In response to such concerns, the two portal news sites have introduced new measures, such as limiting the number of comments and recommendations that a person can post and restricting user comments to a shorter time. Given the potential harm of user comments, such restrictions seem reasonable, but our findings suggest that regulatory policies alone might not effectively minimize harmful comment effects. Our data indicate that one's own inclinations—personal opinion and its strength—are highly related to biased perceptions of opinion climate in comment sections and among the public, whereas political knowledge promotes a relatively accurate estimation of others' opinions. These results suggest that media education about the role of personal bias and knowledge in the formation of citizens' political perceptions, including opinion climate perceptions, should be considered. Moreover, the effectiveness of various commenting restriction policies needs to be carefully monitored to prevent excessive restrictions that unduly restrain free expression and public deliberation.

The limitations of the current research need to be noted. First, we acknowledge that our correlational data cannot establish causal associations. Although we presume that personal opinions precede the perception of opinion climates, a reverse causal direction is plausible, given that perceived public opinion can potentially affect one's own opinions and attitudes (Noelle-Neumann, 1993; Tsfati et al., 2014). In addition, comment readers might have selectively chosen either *Naver* or *Daum* to get affirming comments from others. Thus, instead of comment reading influencing opinion climate perceptions, the opposite direction—choosing and reading user comments to confirm pre-perceived opinions—is possible. This alternative path seems similar to selective exposure to media outlets that agree with already held opinions. Future research needs to examine whether perceived partisan opinion climates in user comment sections and among the public influence the selection of a particular commenting space.

A second limitation of this research is related to the measurement of comment reading. To gauge exposure to user comments, we asked how often respondents read user comments on news about politics and governmental activities. We presumed that the comments in *Naver* were more negative toward the president and his administration and that the comments in *Daum* were more positive based on a prior content analysis and news reports (Bae & Ahn, 2021; Jung & Kim, 2020; "Two Views," 2020). We further expected that reading comments from the two sites with contrasting stances would relate differently to respondents' perceptions of the opinion climate in the comment sections and the public. However, our

measure cannot directly capture the comments that each respondent read. Ideally, passive data in which respondents' online activities are automatically recorded should be used to accurately assess how often respondents encounter comments either in favor of or against different political positions.

Finally, national characteristics might have affected the results. Korea is known to have a highly partisan news media culture and structure (Hyun & Seo, 2021). The contrast in partisan stances in the user comment sections of the two portal news sites seems to reflect this national feature. In such a polarized political and media environment, concerns about the undue power of user comments can be strong among the public and political leaders. Default negative views about user comments might have influenced the participants' perceptions of user comments as hostile rather than friendly. Future research from different national contexts should be conducted to determine whether the findings of this study can be replicated.

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