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The influence of prior issue attitudes on perception bias and perceived message credibility in participatory websites

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Abstract

Using a simulated participatory website focused on the issue of a smoking ban, this study investigates whether individuals perceive similar messages differently and how their prior issue attitudes relate to perception bias and perceived message credibility in the context of online environment. In general, findings indicate biased assimilation of media content online. Participants perceived the entire online discussion to be congruent with their prior issue attitudes. However, for the smoking ban supporters, a relative hostile media perception was observed in that they perceive the ban opposing messages as significantly more biased in favor of the opposing position. Lastly, participants perceived a higher level of credibility for specific posts supporting their own point of view. Findings and implications are discussed in comparison with previous research on media perception.

Keywords: prior issue attitude, perception bias, biased assimilation, hostile media perception, perceived message credibility, smoking ban, participatory websites

1. Introduction

The Internet facilitates active expression of opinions on public policy issues (Wojcieszak & Mutz, 2009). Through diverse interactions and topical discussions among users, people are more freely and interactively communicating with each other by sharing their opinions (Walther & Jang, 2012). Consequently, Internet users are heavily exposed to diverse opinions from both supporting and opposing viewpoints about an issue (Nah, Veenstra, & Shah, 2006). Several studies have examined how people perceive messages similar or opposite to their own attitudes in the traditional media context, but what remains relatively unexplored is how such messages are perceived in online settings (Vallone, Ross, & Lepper, 1985; Gunther, Christen, Liebhart, & Chia, 2001; Gunther & Schmitt, 2004; Richardson, Huddy, & Morgan, 2008). Considering that online messages are often provided by advocates from different sides of an issue and contain firmly held extreme opinions, the present study investigates two related phenomena: first, whether people perceive the same online messages differently according to their prior issue attitudes; second, how their prior issue attitudes are related to perception bias and perceived message credibility toward online messages.

The study examines the policy issue of smoking bans on campus. This controversial issue was chosen for several reasons: first, it has acquired a moderately high profile in various mass media; second, it has had a durable shelf life; and third, it has generated a heated and lively debate between identifiable groups with strong prior issue attitudes. In particular, partly due to a series of discussions about the smoke-free campus policies to make all state-supported college and university campuses smoke free, voices on either side of the debate grew more and more intense. In participatory websites among Internet users, arguments both for and against smoking bans on campus appeared frequently. Given this situation, the study looks at how people perceive the same online messages about a smoking ban on campus differently based on their prior attitude about the issue.

2. Prior issue attitudes and perception bias

People reconcile new information with their pre-existing attitudes in a biased manner (Kuhn, 2001). That is, when people are exposed to new information, their prior issue attitudes are likely to predispose them not to interpret the information as originally intended. This phenomenon is known as perception bias and is constituted of two seemingly inconsistent processes, biased assimilation and hostile media perception (Gunther & Schmitt, 2004). Biased assimilation refers to people's tendency to interpret incoming stimuli as congruent with their prior issue attitudes, whereas hostile media perception refers to people's tendency to perceive stimuli as unfavorable and contradictory to their prior issue attitudes. Although biased assimilation and hostile media perception have been known to affect media perceptions, relatively few studies have tested these concepts in the context of online

environment.

The concept of attitude has been broadly defined as a construct that implies an individual's positive or negative view of an object such as a person, place, thing, issue, or event (Fishbein & Raven, 1962). In particular, attitude implies cognitive, affective, and behavioral features of response, such as beliefs about the world and feelings toward an object that encourage certain actions (Eagly & Chaiken, 1993; Zanna & Rempel, 1988). In previous media perception studies, various concepts have been presented, for example prior belief, issue-involvement, partisanship, and preconception (Giner-Sorolla & Chaiken, 1994; Gunther & Schmitt, 2004; Vallone, Ross, & Lepper, 1985; Lord, Ross, & Lepper, 1979). But those concepts have been consistently regarded as attitude constructs on a specific issue or object. In general, an attitude construct is a regular evaluation corresponding to individuals' internal states of thought, feeling, and action when individuals encounter particular objects. As one such construct, prior issue attitudes are defined in this study as the degree to which a person has a favorable or unfavorable appraisal of an issue when evaluating new information about the issue. It is known that individuals who have prior attitudes toward a certain issues perceive media content about it in biased ways. Specifically, there are two competing yet equally convincing perception biases, namely biased assimilation and hostile media perception.

2.1 Biased assimilation

Emphasizing individuals' egocentric motivations, biased assimilation suggests that people are more likely to interpret the newly obtained information as supporting rather than opposing their own prior issue attitudes (Gunther & Schmitt, 2004). As defined by previous researchers, biased assimilation connotes the seeking or interpreting of information in ways that support pre-existing attitudes (Matheson & Dursun, 2001). In other words, biased assimilation is a tendency to interpret new information as supporting one's own prior beliefs and to avoid information that contradicts them. Thus, people often seek out, notice, recall, and process only information that confirms their own prior issue attitudes. At the same time, they sometimes ignore, fail to remember, forget, and undervalue information that contradicts their prior issue attitudes.

Researchers first demonstrated biased assimilation by studying how different groups of students at Dartmouth and Princeton watched a football game between their two teams (Hastorf & Cantril, 1954). After watching the game, each group of subjects differently perceived it as portraying their own team to be more sportsmanlike and honorable. Moreover, the majority of students from the university that won the game perceived that the game was fair and fun, whereas the students from the university that lost evaluated the game as dirty and rough. This result revealed that people interpret new information in ways that support their prior issue attitudes. Subsequent researchers also suggested that people accept confirming evidence as relevant and reliable while scrutinizing disconfirming evidence as irrelevant and unreliable (Lord et al., 1979). Later studies also confirmed that people give greater weight to information that supports their prior issue attitudes than to information that counters them (Shaklee & Fischhoff, 1982; Skov & Sherman, 1986; Slater & Rouner, 1996). These researchers concluded that individuals' initial positions are increasingly polarized as the result of biased assimilation.

Based on previous studies of biased assimilation, online information users with prior issue attitudes might show biased perception that confirms their prior issue attitudes by interpreting particular information as favorable to them. At the same time, they might ignore opposing messages. In other words, prior issue attitudes are likely to influence the perceptions of individuals who encounter diverse types of messages in participatory websites. Based on these insights from previous studies on biased assimilation, this study proposes the following hypotheses:

Hypothesis 1: Online information users with prior issue attitudes are likely to perceive the content in participatory websites as congruent with their own point of view as follows:

a) Smoking ban supporters are likely to perceive the content in participatory websites as supporting a smoking ban.

b) Smoking ban opposers are likely to perceive the content in participatory websites as opposing a smoking ban.

2.2 Hostile media perception

While biased assimilation leads people to perceive media content in ways that favor their own views, hostile media perception goes in the opposite direction. Hostile media perception suggests that those who have prior issue attitudes perceive mass media content to be biased against their own opinions, even when media coverage does not include any presence of bias. Vallone and his colleagues first suggested that hostile media perception explains the tendency for a highly involved audience to judge mass media coverage as unfavorable to their own

point of view (Vallone et al., 1985). Perloff also claimed that individuals with prior issue attitudes on one or another side of a divisive issue perceive content as biased in different directions, even if the content is supposedly well-balanced (Perloff, 1989). Subsequent researchers provided empirical evidence for this claim, highlighting that hostile media perception is particularly relevant to the source of information (Gunther & Schmitt, 2004). In their experiment, participants were provided with a newspaper article and a student essay. Both texts contained the same balanced content, but participants perceived the newspaper article as biased and the student essay as impartial. Based on this finding, individuals tend to perceive media coverage as unjustly slanted against their opinion even when that coverage is well balanced.

Although the original concept of hostile media perception assumes that media content is inherently balanced, this tendency to make biased evaluations of media content was also confirmed in cases where the coverage was clearly unbalanced (Gunther et al., 2001). Gunther et al. (2001) described this phenomenon as relative hostile media perception. When relative hostile perception occurs, participants on both sides of a controversy view media content as biased in the same directions. However, each side sees the slant as relatively less supportive and more opposing to their own position. In sum, while groups who oppose each other on an issue will experience perception bias in a consistent direction, individuals in one group will perceive media coverage as significantly more unfavorable to their own position relative to individuals in the other group.

Literature on hostile media perception has also called attention to the active audience. This concept relates to what individuals have in mind and how they actively perform certain cognitive functions in evaluating new information (Schmitt, Gunther, & Liebhart, 2004). But the formats in which new information is likely to appear have changed in recent years. Traditionally, partisan groups merely expressed their views on specific issues by staging protests, issuing threats, and demonstrating. By contrast, in recent years, activist Internet users easily express their views by posting reviews, evaluations, opinions, or experiences using diverse interactive online communication tools (Nah et al., 2006). One such tool is participatory websites (Walther & Jang, 2012). Incorporating diverse features of computer-mediated communication, participatory websites facilitate topical discussions among the users who are involved in the issue. By posting comment on others' previous contribution, participatory websites users produce messages about the issue, and such messages are associated with attitude change (Lee, Rodgers, & Kim, 2009). Therefore, in this new media context, online information users with prior attitudes on one side of an issue might perceive messages in participatory websites to be biased against their own prior issue attitudes. Based on previous research on hostile media perception, this study proposes the following hypothesis:

Hypothesis 2: Online information users with prior issue attitudes are likely to perceive the content in participatory websites as unfavorable to their own point of view as follows:

a) Smoking ban supporters are likely to perceive the content in participatory websites as opposing a smoking ban.

b) Smoking ban opposers are likely to perceive the content in participatory websites as supporting a smoking ban.

3. Prior issue attitudes and perceived message credibility

Previous studies regarding online information suggested that perceived message credibility enables researchers to evaluate individuals' overall assessments about online messages (Franke, 1996; Slater & Rouner, 1996). Since online messages are often too brief or unavailable to consider sources, analyzing source credibility on the Internet is a limited or questionable endeavor (Eastin, 2001; Fritch & Cromwell, 2001). Once researchers discovered the advantages of studying message evaluations in terms of perceived credibility, they began to examine perceived message credibility by measuring diverse aspects of message content, such as accuracy, fairness, lack of bias, completeness, depth, and trustworthiness (Flanagin & Metzger, 2001; Johnson & Kaye, 2002; Johnson, Kaye, Bichard, & Wong, 2007). Kiousis also demonstrated that message credibility concerns the degree to which individuals see media content as conveying trustworthiness, believability, accuracy, or expertise (Kiousis, 2003).

In a study about television news, Zanna and Del Vecchio (1973) demonstrated that credibility is enhanced when individuals perceive the position taken by mass media to match their own prior issue attitudes. Subsequent researchers also investigated mass media in online environment and suggested that information users perceive higher level of credibility from like-minded group members who have similar viewpoints about the issue (Metzger, Flanagin, & Medders, 2010). That is, in most information seeking situations, online information users perceive credibility from the messages that support and confirm one's prior issue attitudes. In light of this finding, perceived message credibility can also be conceived as believability, or the extent to which individuals perceive

the information as representing their own belief (Tseng & Fogg, 1999). A study by Choi and his colleagues also supported the conclusion that, in the context of online media, similarity to an individual's prior attitude is likely to predict perceived message credibility (Choi, Watt, & Lynch, 2006). In sum, the perception of similarity between individuals' prior issue attitudes and the obtained information is positively related to perceived message credibility.

Because individuals have different prior issue attitudes when they are exposed to media content, people are likely to evaluate perceived message credibility differently. Based on findings from previous research on perceived message credibility, this study advances the following hypotheses:

Hypothesis 3: Online information users with prior issue attitudes are likely to perceive the media content supporting their own point of view as more credible as follows:

a) Smoking ban supporters are likely to perceive the content supporting a smoking ban to be more credible than smoking ban opposers do.

b) Smoking ban opposers are likely to perceive the content opposing a smoking ban to be more credible than the smoking ban supporters do.

4. Moderation/mediation role of perception bias

An important question that remains concerns the relation among the three variables: prior issue attitudes, perception bias, and perceived message credibility. One possibility is a mediating relation. Individuals' prior attitudes may not directly lead to their perception of credibility for the given online messages. Instead, an important mediator of perceived message credibility might be individuals' perception bias that the user-generated posts in the participatory websites are either for or against their prior issue attitude. Empirical studies have also found that information is assessed as less credible when it is perceived to be somewhat biased in light of political or persuasive motivations (Flanagin & Metzger, 2000; O'Keefe, 2002). Another possibility is a moderating relation among the three variables. In other words, it is possible that perception bias moderates the relationship between prior issue attitudes and perceived message credibility. Those who have prior attitudes might think that user-generated messages are less credible only when they perceive the messages to be extremely biased (Johnson et al., 2007). Because of these considerations, in addition to the three sets of hypotheses, we explore the mediating and moderating relations among the three variables.

Research Question: What are the relationships among the three variables? Does perception bias either mediate or moderate the relationship between prior issue attitudes and perceived message credibility?

5. Methodology

5.1 Participants

To empirically test the hypotheses and a research question, an online survey was conducted with 321 participants (67% female and 33% male; mean age = 21.17; 72.9% Caucasian, 8.1% African American, 0.6% Hispanic, 14.6% Asian, and 4.4% other). Participants were solicited from several introductory communication courses at a major university in the Midwest. Although student samples may not represent the general population, they are an appropriate target audience because they tend to be active Internet users who seek and search widely for online information (Brown & Muchira, 2004) and they have been exposed to the heated discussions about smoke-free campus where this study was carried out.

5.2 Stimulus materials

The survey included a simulated participatory website for its treatment messages. A participatory website titled "How do you feel about smoking bans on campus?" was constructed. Guided by Walther and Jang (2012), the simulated web page adhered to the template of a participatory web page that includes proprietor content (i.e., messages posted by the primary author or proprietor of a webpage) and user-generated content (i.e., the messages posted by nonproprietary visitors). To increase external validity, real arguments from both ban supporters and ban opposers were assembled from several recent news articles and readers' comments. Using previous studies as a guide, the posts supporting and opposing smoking bans were created and revised until they are comparable in length and similar in style (Gunther & Schmitt, 2004). Finally, the stimuli were pre-tested among 28 individuals to ensure whether it contained a balance of positions on the issue of smoking bans on campus. One-sample t-test was performed using 0 as a test value, which is the neutral midpoint on a 7-point scale in which -3 means "extremely supporting smoking bans" and 3 means "extremely opposing smoking

bans." The position of the created participatory website on the issue of smoking bans (M = .11, SD = .79) was not significantly different from 0, t (27) = .721, p = .477. Therefore, the constructed stimuli were well balanced.

5.3 Procedure

Participants were asked to complete an online survey titled "Perception of Online Information Study." The survey's first part asked the participants' position and degree of attitude toward the issue of smoking bans on campus. Next, they were asked to read the stimulus, a participatory website. The content of this participatory website included both proprietor content and user-generated content. First, the proprietor content briefly introduced the divisive controversy surrounding the issue. Then, the user-generated content of three posts each for and against smoking bans on campus. To guard against possible order effects, the order of supporting and opposing posts was randomized before each participant was randomly assigned to a survey questionnaire. After reading the stimuli, participants were asked how they perceived the online messages to be positioned on the issue and how credible the message was regarding each of the supporting and opposing posts, as well as the participatory website as a whole.

5.4 Measures

Prior issue attitudes. To figure out where participants position themselves on the divisive issue of smoking bans on campus, and to classify them into three different groups (ban-supporting, neutral, and ban-opposing), three questions were asked. These questions assessed individuals' prior issue attitudes by following a measurement used by Gunther et al. (2001). First, participants' extent of position on the issue was assessed by asking "When you consider the issue of 'Smoking ban on campus', where do you position yourself on this issue?" Response options were ranged from -3 (extremely supporting smoking bans) to 3 (extremely opposing smoking bans) on a 7-point scale. Then, additional questions about attitude toward smoking ban supporters and smoking ban opposers were asked: "How strongly do you support smoking ban-supporting group?" and "How strongly do you support smoking ban-opposing group?" The 5-point scale ranged from 1 (not at all support) to 5 (extremely support). After appropriate recoding, the averaged values for the extent of position and attitude toward both supporting and opposing groups were calculated as indicators of prior issue attitudes. Exploratory Factor Analysis (EFA) with Principal Component Analysis (PCA) extraction method clearly showed one factor with 73.34 percent of total variance explained, using the eigenvalue criteria of 1. Cronbach's alpha reliability also indicated high internal consistency (α = .83).

Perception bias. The measure for the perception bias variable was adapted from a previous study and modified to determine how participants identified the stimulus to be positioned on the issue (Chia, Yong, Wong, & Koh, 2007). They were asked to answer the question "How do you identify 'this post' to be positioned on the issue?" for each of the six user-generated contents (i.e., three posts supporting the ban, and three opposing). In addition, a replication question, "How do you identify 'the participatory website, as a whole' to be positioned on the issue?", was asked to measure overall perception bias toward the participatory website. All of these questions were followed by a 7-point scale anchored by -3 (extremely supporting smoking ban) to 3 (extremely opposing smoking ban). Since the stimulus was composed of six separate posts from both supporting and opposing sides, both perception bias toward supporting and opposing posts were examined. For perception bias toward ban-supporting posts, the EFA with PCA extraction method based on varimax rotation showed one factor with 79.09 percent of total variance explained. Also, for perception bias toward ban-opposing posts, there was one factor with 73.53 percent of total variance explained. Cronbach's alpha also indicated strong internal consistency for perception bias toward ban-supporting posts (α = .75) and perception bias toward ban-opposing posts (α = .71) (See Table 1 for description).

Perceived message credibility. Guided by previous studies (Gaziano & McGrath, 1986; Johnson et al., 2007; Meyer, 1988; Newhagen & Nass, 1989), the survey asked participants to judge each user-generated content, as well as the participatory website as a whole, to the extent of believability, accuracy, fairness, and depth of information by using a 5-point scale, ranging from 1 (not at all) to 5 (extremely). First, analysis was conducted regarding the perceived message credibility of each side. For perceived message credibility of ban-supporting posts, the EFA with PCA extraction method clearly indicated one factor solution with 75.11 percent of variance explained; for perceived message credibility of ban-opposing posts, one factor with 75.32 percent of variance explained. Cronbach's alpha indicated strong internal consistency for perceived message credibility toward ban-supporting posts (α = .76) and perceived message credibility toward ban-opposing posts (α = .71). For perceived message credibility of the participatory website as a whole, the EFA with PCA extraction method clearly showed one factor with 73.15 percent of total variance explained using the eigenvalue criteria of 1. Because these four items had high reliability as predicted (α = .87), they were averaged to construct the variable of perceived

message credibility toward the participatory website as a whole (See Table 2 for description).

Table 1. Descriptive Statistics of Perception Bias

Factor Variables	Min.	Max.	*M*	*SD*
(Ban-supporting posts)				
Ban-supporting group	-3.00	2.67	-1.68	1.24
Neutral group	-3.00	1.00	-0.94	1.19
Ban-opposing group	-3.00	3.00	-0.51	1.75
All participants *(N = 321)*	-3.00	3.00	-1.40	1.41
(Ban-opposing posts)				
Ban-supporting group	-2.67	3.00	1.74	1.19
Neutral group	-1.33	3.00	1.12	1.28
Ban-opposing group	-2.33	3.00	0.82	1.64
All participants *(N = 321)*	-2.67	3.00	1.52	1.34
(The participatory website as a whole)				
Ban-supporting group	-3.00	3.00	-0.20	1.11
Neutral group	-2.00	2.00	0.10	0.80
Ban-opposing group	-2.00	3.00	0.35	1.22
All participants *(N = 321)*	-3.00	3.00	-0.07	1.12

**Positive number indicates ban-opposing sides and negative number indicates ban-supporting sides.*

Table 2. Descriptive Statistics of Perceived Message Credibility

Factor Variables	Min.	Max.	*M*	*SD*
(Ban-supporting posts)				
Ban-supporting group	1.75	5.00	3.18	0.60
Neutral group	2.00	4.00	3.00	0.43
Ban-opposing group	1.00	4.25	2.62	0.76
All participants *(N = 321)*	1.00	5.00	3.06	0.65
(Ban-opposing posts)				
Ban-supporting group	1.00	4.25	2.59	0.67
Neutral group	1.83	3.75	2.92	0.51
Ban-opposing group	1.67	5.00	3.05	0.68
All participants *(N = 321)*	1.00	5.00	2.70	0.68
(The participatory website as a whole)				
Ban-supporting group	1.50	4.50	2.99	0.67
Neutral group	2.25	4.00	3.06	0.46
Ban-opposing group	1.00	5.00	2.83	0.67
All participants *(N = 321)*	1.00	5.00	2.97	0.66

** The scale ranges from 1 (not at all credible) to 5 (extremely credible)*

5.5 Analytic strategy

First, the classification of subjects as ban-supporting group, neutral group, and ban-opposing group was performed according to the extent of the participants' prior issue attitudes. Those with prior issue attitudes below 0 on the scale were considered to belong to the ban-supporting group (M = -2.29, SD = 1.06), and those above 0 to the ban-opposing group (M = 1.66, SD = 1.04). Individuals with 0 prior issue attitudes were considered to belong to the neutral group (M = 0, SD = 0). Dividing the sample at this point resulted in 234 participants (73%)

classified as ban-supporting group, 30 (9%) as neutral group, and 57 (18%) as ban-opposing group.

To determine the effectiveness of this classification, and to test whether these three different groups showed significantly different prior issue attitudes, a one-way ANOVA was conducted. Guided by Howell (2002), even though the sample sizes among the three different groups were uneven, a one-way ANOVA was proceeded without adjusting the sample sizes. Howell (2002) suggested that ANOVA does not show a difference between the equal sample sizes in each group and the unequal sample sizes in each group when the numbers of samples in each group reflect the original population. In addition, ANOVA is known to be quite robust even for extremely uneven sample sizes (Kikvidze & Moya-Laraño, 2008). As expected, the result revealed a statistically significant difference among the three groups regarding their prior attitude toward the issue, $F(2,319) = 385.19$, $p < .01$, $\eta 2 = .71$. In addition, post hoc comparison using Scheffe's procedure at $p < .05$ showed that the three groups were significantly different from one another.

Next, since the content contained three posts each from both supporting and opposing sides, individuals' perception bias and perceived message credibility were measured with respect to three types of posts: ban-supporting posts, ban-opposing posts, and the participatory website as a whole. Table 1 shows descriptive statistics of perception bias toward ban-supporting posts, ban-opposing posts, and the participatory website as a whole. Table 2 shows perceived credibility toward each post, ban-supporting posts, ban-opposing posts, and the participatory website as a whole. Based on group classification, one-way ANOVA was performed to examine how these three groups differed with respect to perception bias and perceived message credibility using the SPSS program. Because SPSS computes only partial eta-squared ($\eta 2$), full eta-squared was computed manually and reported to assess more accurately the effect sizes (Levine & Hullett, 2002).

6. Results

6.1. Biased assimilation

Hypothesis 1 predicted that online information users with prior issue attitudes are likely to perceive the content in participatory websites as congruent with their own point of view: (a) the ban-supporting group is likely to perceive the content as supporting the smoking ban;(b) the ban-opposing group is likely to perceive the content as opposing the smoking ban. The data appear to partially support Hypothesis 1. As shown in Table 3, the three groups differed significantly from each other in perception bias toward the participatory website as a whole, $F(2,319) = 6.14$, $p < .05$, $\eta 2 = .04$; toward the ban-supporting posts, $F(2,319) = 19.55$, $p < .05$, $\eta 2 = .12$; and toward the ban-opposing posts, $F(2,319) = 13.12$, $p < .05$, $\eta 2 = .08$. In each post hoc comparison, the significant differences occurred as follows:

First, in the case of perception bias toward the participatory website as a whole, post hoc comparison using Scheffe's procedure ($p < .05$) showed that the ban-supporting group perceived the whole web page to be more favorable to the opinion of the ban-supporting side ($M = -.20$, $SD = 1.11$). At the same time, the ban-opposing group perceived the whole web page to be more favorable to the ban-opposing side ($M = .35$, $SD = 1.22$). The neutral group did not differ from either the supporting or opposing group ($M = .10$, $SD = .80$). Therefore, both Hypothesis 1-a) and 1-b) were supported with respect to perception bias toward the content as a whole.

Second, in the case of perception bias toward ban-supporting posts, the ban-supporting group perceived the ban-supporting posts to be more favorable to the ban-supporting opinions ($M = -1.68$, $SD = 1.24$). At the same time, the neutral group ($M = -.94$, $SD = 1.19$) and the ban-opposing group ($M = -.51$, $SD = 1.75$) perceived the ban-supporting posts to be less favorable to the ban-supporting opinions. Since all the participants perceived the content to be positioned in favor of the ban-supporting side, Hypothesis 1-a) was supported, but Hypothesis 1-b) was not supported with perception bias toward the ban-supporting posts.

Finally, in the case of perception bias toward the ban-opposing posts, the ban-supporting group ($M = 1.74$, $SD = 1.19$) perceived the ban-opposing posts to be more favorable to the ban-opposing opinions. At the same time, the neutral group ($M = 1.12$, $SD = 1.28$) and the ban-opposing group ($M = .82$, $SD = 1.64$) perceived the ban-opposing posts to be relatively less favorable to the ban-opposing side. Therefore, although Hypothesis 1-b) was supported, Hypothesis 1-a) was not supported in that all the participants perceived the content to be positioned in favor of the ban-opposing side.

6.2. Hostile media perception

Hypothesis 2 predicted that online information users with prior issue attitudes are likely to perceive the content as favorable to the opinions of the opposite side. Based on the results discussed above, Hypothesis 2 did not seem supported because both sides perceived the ban-supporting and -opposing posts to be actually positioned in

those directions, not in favor of the opposite side. In addition, for the participatory website as a whole, participants tended to perceive it to be congruent with their prior issue attitudes. In other words, both ban-supporting and -opposing groups perceived the whole web page to be favorable toward their own point of view, not as favorable toward the opinions of the opposite side.

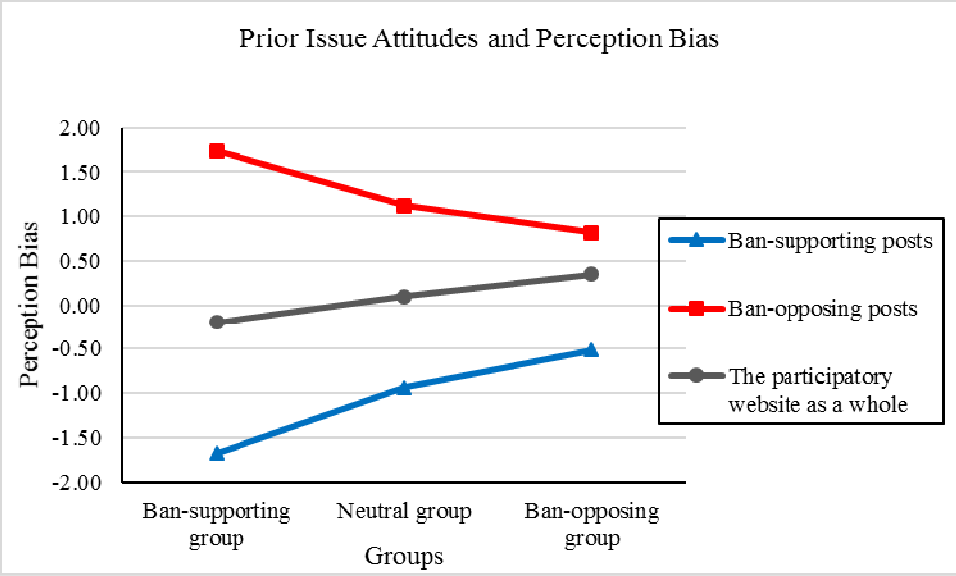
However, perception bias toward the ban-opposing posts clearly provided evidence of the relative hostile media perception in that the ban-supporting group (M = 1.74, SD = 1.19) perceived the user-generated contents as significantly ($p < .05$) more biased in favor of the ban-opposing side than did the neutral group (M = 1.12, SD = 1.28) or the ban-opposing group (M = .82, SD = 1.64) (See Table 3)

Table 3. ANOVA: Perception Bias across Ban-supporting, Neutral, and Ban-opposing groups

		Sum of Squares	df	Mean Square	F	Sig.	η^2
Perception Bias (Ban-supporting posts)	Between Groups	69.96	2	34.98	19.55	0.00*	0.12
	Within Groups	568.88	318	1.79			
	Total	638.84	320				
Perception Bias (Ban-opposing posts)	Between Groups	43.59	2	21.8	13.12	0.00*	0.08
	Within Groups	528.36	318	1.66			
	Total	571.96	320				
Perception Bias (The participatory website as a whole)	Between Groups	14.96	2	7.48	6.14	0.00*	0.04
	Within Groups	387.24	318	1.22			
	Total	402.21	320				

*Notes: * $p < .05$*

Figure 1. Prior Issue Attitudes and Perception Bias



** Positive scores on perception bias indicate that participants perceived the message to be more on the ban-opposing side. At the same time, negative scores on perception bias indicate that participants perceived the message to be more on the ban-supporting side.*

6.3. Perceived message credibility

Hypothesis 3 predicted that the ban-supporting group is likely to perceive ban-supporting content to be more credible than the ban-opposing group does, and that the ban-opposing group is likely to perceive ban-opposing content to be more credible than the ban-supporting group does. The data appear to support Hypothesis 3. As shown in Table 4, results of one-way ANOVA suggested that there was a significant difference among the three

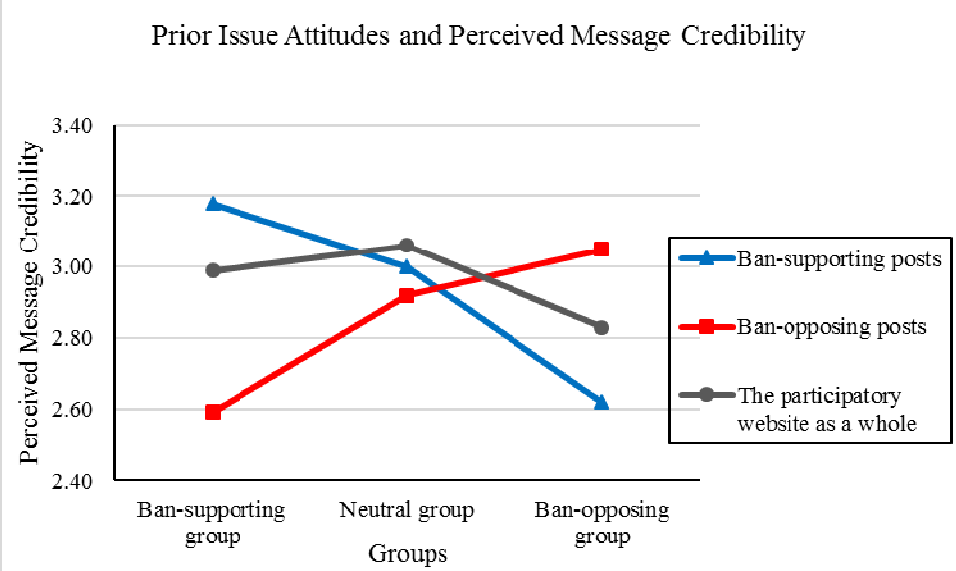
groups regarding the perceived message credibility of ban-supporting posts, F (2,319) = 18.51, p < .05, η2 = .10. Post hoc comparison using Scheffe's procedure (p < .05) showed that the ban-supporting group (M = 3.18, SD = .60) and the neutral group (M = 3.00, SD = .43) showed higher perceived message credibility of the ban-supporting posts than the ban-opposing group did (M = 2.62, SD = .76). The ban-supporting group and the neutral group did not significantly differ from each other.

Table 4. ANOVA: Perceived message credibility across Ban-supporting, Neutral, and Ban-opposing groups

		Sum of Squares	df	Mean Square	F	Sig.	η^2
Perceived message credibility (Ban-supporting posts)	Between Groups	69.96	2	7.09	18.51	0.00*	0.10
	Within Groups	568.88	318	0.38			
	Total	638.84	320				
Perceived message credibility (Ban-opposing posts)	Between Groups	43.59	2	5.57	12.80	0.00*	0.07
	Within Groups	528.36	318	0.44			
	Total	571.96	320				
Perceived message credibility (The participatory website as a whole)	Between Groups	14.96	2	0.70	1.64	0.19	0.01
	Within Groups	387.24	318	0.43			
	Total	402.21	320				

*Notes: * p < .05*

Figure 2. Prior Issue Attitudes and Perceived Message Credibility



** Higher scores on perceived message credibility indicate that participants perceived the message to be more credible.*

Moreover, one-way ANOVA was performed to test perceived message credibility of ban-opposing posts among the three groups. The result suggested that there was a significant difference among these groups regarding the perceived message credibility of the ban-opposing posts, F (2,319) = 12.80, p < .05, η2 = .07. That is, the ban-opposing group (M = 3.05, SD = .68) and the neutral group (M = 2.92, SD = .51) showed higher perceived message credibility of ban-opposing posts than the ban-supporting group did (M = 2.59, SD = .67). The ban-opposing group and neutral group did not significantly differ from each other.

Additionally, regarding the participatory website as a whole containing opinions from both sides, one-way ANOVA test resulted that there was no significant difference among the three groups regarding perceived message credibility of the content as a whole, F (2,319) = 1.64, p > .59, η2 = .01. Participants judged the content to be at approximately the same levels of perceived message credibility. Additional post hoc comparison using

Scheffe's procedure also showed that the ban-supporting group (M = 2.99, SD = .67), neutral group (M = 3.06, SD = .46) and the ban-opposing group (M = 2.83, SD = .67) did not significantly differ from each other.

6.4. Mediation/moderation role of perception bias

The remaining questions about the associations among the three variables concerned the potential mediating role of perception bias in the relationship between prior issue attitudes and perceived message credibility. For a mediation test, the current study carried out the mediation specification procedures proposed by Baron and Kenny (1986). According to those procedures, four conditions are required for mediating relationships: (1) the independent variable is significantly related to the mediator; (2) the independent variable is significantly related to the dependent variable; (3) the mediator is significantly related to the dependent variable; and (4) the effect of the independent variable on the dependent variable decreases when the mediator is added to the model. While a regression analysis with the independent variable predicting the mediator and the mediator predicting the dependent variable examined the first two conditions, the Sobel test replaces the last three conditions and reports statistical significance of the indirect effects. As shown in Table 5, the results indicate no evidence for indirect effects. The data revealed that perception bias did not serve as a significant mediator between prior issue attitudes and perceived message credibility in the case of ban-supporting posts (Z =1.20) and ban-opposing posts (Z = -.87). Since the second mediation specification step (the independent variable is significantly related to the dependent variable) was violated for the content as a whole, analysis about the mediating relationship in the participatory website as a whole was excluded from this study.

For the moderation test, a 2 X 2 factorial design of ANOVA was conducted on perceived message credibility via the GLM procedure. The first factor was prior issue attitudes (ban-supporting group, ban-opposing group) and the second was perception bias (biased as ban-supporting, biased as ban-opposing). The results showed a significant main effect for prior issue attitudes in the case of perceived message credibility for ban-supporting posts, $F(1,138) = 11.50$, $p < .05$, and for ban-opposing posts, $F(1,138) = 12.08$, $p < .05$. However, the results indicate no evidence of a significant main effect of perception bias for ban-supporting posts, $F(1,138) = .28$, $p > .05$, and for ban-opposing posts, $F(1,138) = 2.64$, $p > .05$. Moreover, there was a non-significant interaction of perceived message credibility between prior issue attitudes and perception bias in the case of ban-supporting posts, $F(1,138) = 1.75$, $p > .05$, and ban-opposing posts, $F(1,138) = 0.01$, $p > .05$. In sum, these additional tests indicate no evidence for either mediating or moderating relationships among prior issue attitudes, perception bias, and perceived message credibility (See Table 5).

7. Discussion

The purpose of this study was to explore whether individuals' prior issue attitudes are related to biased perception and perceived message credibility with respect to online messages. Given the popularity and the growth of participatory websites, individuals might more freely and interactively communicate with each other by posting their opinions on web-based communication channels. Focusing on the controversial issue of smoking bans on campus, this study analyzed the role of individuals' prior issue attitudes on perception bias and perceived message credibility.

The findings indicate that individuals with prior issue attitudes perceived information in online media in a biased way. That is, although both the ban-supporting and -opposing groups identically perceived the ban-supporting posts to be positioned in favor of the ban-supporting side and the ban-opposing posts to be positioned in favor of the ban-opposing side, there was a significant difference in the extent of perception bias among the three groups.

First and foremost, overall findings seem to point not to hostile media perception but rather to biased assimilation, the tendency for individuals to perceive information as supporting their own prior issue attitudes. On one hand, the ban-supporting group perceived ban-supporting posts to be more favorable to their opinion, while the neutral group and the ban-opposing group perceived ban-supporting posts to be relatively less favorable to the ban-supporting side. On the other hand, participants perceived the participatory website as a whole, which was set up to be well balanced by including discussions from both ban-supporting and -opposing sides, to be congruent with their own prior issue attitudes. This finding seems at odds with previous research, which found that mass media conditions generate hostile media perception (Gunther & Schmitt, 2004).

Table 5. Mediation Test

	Mediating relationship in Ban-supporting posts		Mediating relationship in Ban-opposing posts	
Predictors	Perception Bias (Mediator)	Perceived Message Credibility (DV)	Perception Bias (Mediator)	Perceived Message Credibility (DV)
Step1: Direct effects of the independent variable (IV) on the mediator				
Prior Issue Attitudes (IV)	.318 (.039)*		-.235 (.038)*	
Step2: Direct effects of the independent variable (IV) on the dependent variable (DV)				
Prior Issue Attitudes (IV)		-.120 (.019)*		.135 (.019)*
Step3: Effects of both the independent variables (IV) and the mediator on the dependent variable (DV)				
Prior Issue Attitudes (IV)		-.131 (.020)*		.141 (.020)*
Perception Bias (Mediator)		.033 (.027)		.025 (.028)
Aroian version of the Sobel test (z-score)		1.20		-0.87

*Notes: * $p < .05$*

The steps are based on Baron and Kenny's mediation specification procedure (1986). The numeric values are unstandardized beta coefficients in regression models. Standard errors are in parentheses. For statistical significance testing of the indirect effects (that replace step 3 and 4), the Aroian version of the Sobel test was used, suggested by Baron and Kenny (1986) and others (MacKinnon et al., 2002; also see Gelfand, Mensinger, and Tenhave 2009; Luthans 2008), because this method offers "the most power and the most accurate Type I error rates in all cases compared to the other methods" (MacKinnon et al., 2002, p. 99). The formula is as follows: $\checkmark b^2 s_a^2 + a2 s_b^2 + s_a^2 s_b^2$

Here, s_a *indicates standard error for a, which is the unstandardized beta coefficient of the independent variable on the mediator, and* s_b *means standard error for b, which is the beta coefficient of the mediator on the dependent variable. These numbers were drawn from the regression models. Then, a Z-test was performed to check statistical significance of the indirect effect coefficient as follows: z-value =* $a*b/(\checkmark b^2 s_a^2 + a^2 s_b^2 + s_a^2 s_b^2)$

One plausible explanation may stem from the difference between the two types of media environments. Past research on hostile media perception focused on traditional media such as TV and newspapers. While these traditional "push" media provide the messages created by a specific sender (e.g., news editor) and the audiences passively accept and consume the given media, the Internet is a "pull" medium. In this study, the content of this participatory website included both proprietor content and user-generated content. Although the proprietor content shows messages posted by the primary author or proprietor of a webpage, the rest of user-generated content contains the arguments and discussions of diverse users. Thus, the participatory websites might be perceived more as a construct of non-mediated messages among the Internet users. Moreover, since the online environment is particularly suited to providing diverse information sources and points of views other than news editors, recent information users might perceive the participatory website as a tool to obtain supportive voices of other users among the arguments and discussions of opponents and supporters. Researchers also confirmed that information users actively seek out specific information from supportive sources (Hwang, Schmierbach, Paek, Gil de Zuniga, & Shah, 2006). Thus, our results supporting biased assimilation, not hostile media perception, argues that individuals might actively search for supportive messages of other users based on their prior issue attitudes and weight them more when making an overall judgment about the context of online media environments.

Interestingly, for perception bias toward the ban-opposing posts, the results demonstrated that the ban-supporting group perceived ban-opposing posts as significantly more biased in favor of the ban-opposing side than did the neutral group or the ban-opposing group. However, all of the participants saw the ban-opposing posts as positioned in the ban-opposing direction. This finding seems to indicate a relative hostile media perception (Gunther et al., 2001). Individuals on both sides interpreted the media content to be actually positioned in the same directions, but each side perceived the slant as relatively more disagreeable to their own position. In other words, the ban-supporting group perceived the ban-opposing posts to be relatively more biased in favor of the ban-opposing side than did the ban-opposing group.

What, though, explains this result of relative hostile media perception only in the case of the smoking ban supporters' perception toward the ban-opposing posts? Whereas the current study found evidence for biased assimilation in the case of the ban-supporting posts and the participatory website as a whole, audience characteristics might be related to this unique result for perception bias toward the ban-opposing posts. As discussed earlier, 73% of the study participants belonged to the ban-supporting group, and they might identify with and better understand the current anti-smoking atmosphere in the U.S. universities and colleges, where support for smoking bans is the majority opinion. According to the spiral of silence hypothesis, people who believe that their private opinions coincide with the majority side of an issue are more likely to speak out publicly, while people who perceive themselves to be on the minority side remain silent to avoid isolating themselves (Noelle-Neumann, 1974; Noelle-Neumann, 1985). Therefore, relative hostile media perception in the case of the ban-opposing posts might be due to the fact that the ban-supporting majority tends to assess ban-opposing opinions as extremely against not only their point of view but also public opinion. Thus, if opinion on a given issue is determined not just by perception of the issue but also by perception of other people's opinion, the majority ban-supporting group might perceive ban-opposing opinions as extremely misleading, while ban-opposing opinions are in the relative minority (Glynn, Ostman, & McDonald, 1995).

This study's findings also indicated that information users perceive more credibility in messages that support their own point of view. As predicted by previous credibility studies, the ban-supporting group perceived the ban-supporting posts to be more credible than the ban-opposing group did, and vice versa (Johnson & Kaye, 2002). However, regarding the perceived message credibility of the participatory website as a whole, there were no significant differences according to participants' prior issue attitudes. Since both ban-supporting and -opposing sides were equally represented in the content of the simulated participatory website, it seems that individuals attributed more credibility to the opinions that supported their own, and less credibility to those that opposed. Therefore, the level of perceived message credibility of the whole participatory website did not differ significantly between the supporting and opposing groups. This result may imply that people perceive more credibility in the specific messages that represent their prior issue attitudes, at the same time that they perceive less credibility in messages that controvert their prior issue attitudes. Therefore, when perceived message credibility of the participatory website as a whole is evaluated, the comparative sum of the message credibility in particular parts of a participatory website might construct an overall perceived message credibility for the whole web page.

Finally, our data do not support any mediating or moderating roles of perception bias in the relationship between prior issue attitudes and perceived message credibility. Despite some existing literature on the relationship between perception bias and perceived credibility, our findings showed no relationship between perception bias and perceived credibility in online messages (Flanagin & Metzger, 2000; O'Keefe, 2002). One possible explanation is that online information users may not think carefully when they evaluate the online messages in participatory websites. This may be so especially when user-generated messages are relatively brief to be considered as a complete dialogue. Accordingly, instead of evaluating each post carefully and systematically, people would simply stick to their prior issue attitudes when evaluating brief messages and the whole web page. Another possibility that it is not perception bias but other mediators or moderators that may intervene in the relationship between prior issue attitudes and perceived message credibility. For example, Gunther and Schmitt (2004) found that individuals' perception of how widely the given message reaches or influences others moderates their perception bias about the given message. Then, the perceived reach or presumed influence to the public may be underlying factors that affect the relationship between prior issue attitudes and perceived message credibility. Although our data do not allow us to empirically test these possibilities, future research should try to explore the underlying mechanisms of how individuals evaluate online messages in diverse environments of participatory websites.

8. Limitations and future implications

A few limitations should be noted. First, it would be more desirable to have a sample of participants that could represent the higher issue involvement. Since typical college students do not have long-term smoking habits, the participants of this study might not show stronger prior issue attitudes in the topic of smoking bans on campus. Thus, the issue salience might generate different results. Future research would benefit from expanding the sample to include a broader range of participants, particularly faculty and staff members. Second, online messages could include different types of topics, such as normative or informative topics. Normative topics are related to people's desire to gain social approval and to avoid social disapproval, whereas informative topics are associated with people's desire to validate reality (McHoskey, 1995).

Compared to purely informational topics, the current anti-smoking atmosphere in the U.S. might influence participants to see the issue of smoking bans on campus as a normative topic. Future research should address these differences and try to replicate our findings in various controversial topics and contexts.

With the increasing use of the Internet for information searches and interactive communication, understanding how individuals perceive online messages is critical. Depending on audiences' existing attitudes toward a certain issue and the strength of those attitudes, individuals may perceive supposedly balanced information or discussions in two opposing ways. Such biased perceptions can damage the original purpose of the given information or create audience misunderstanding and misinterpretation. A question that is beyond the scope of this study but worth exploring in future research is how biased assimilation and hostile media perception relate to message-oriented attitudes and subsequent behaviors. Considering the abundance of controversial and socially divisive issues in participatory websites, our findings on smoking bans on campus might broaden current understandings of how audiences perceive and comprehend online messages in the participatory website.

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