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THE EFFECTS OF ONLINE COMMENTARY ON USERS' INFORMATION PROCESSING IN THE CONTEXT OF ONLINE DISCUSSION FORUMS

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Abstract

Online discussion forum, which plays an important role in online criticism, provides useful information such as online commentaries generated by other users. The paper uses regulatory focus theory to explain how online commentaries are processed differently depending on the user's information processing style and how each self-regulatory mode moderates the impact of online commentaries on one's overall evaluation of information. The study produces three major findings: (1) Promotion-focused users are more likely to distort online information than prevention-focused users do, (2) With hedonic information, information distortion will be stronger for promotion-focused users as compared to prevention-focused users, (3) With utilitarian information, information distortion will be stronger for prevention-focused people as compared to promotion-focused users. These findings have implications for online discussion forums in terms of how to manage users effectively and also how to prevent unintended criticism.

Keywords: online discussion forum, online commentary, regulatory focus, bias information processing

1 INTRODUCTION

Online discussion forums are widely available computer-supported communication technologies that facilitate virtual interaction on the Internet. Online discussion forums are open, internet-based forums that anyone can join to discuss topics of mutual interest (Desanctis, Fayard, Roach, and Jiang, 2003). By supporting extensive online interactions to complement conventional debating, online discussion forums can effectively enrich the process of acquiring, sharing and exchanging knowledge among users, thereby improving learning performance and outcomes (Leidner, Jarvenpaa, 1995). In online discussion forums such as internet news sites or online communities, we commonly face with online commentaries generated by others. Using these commentaries, online discussion forums can be a many-to-many communication space where users can post a new topic and reply to an existing one (Cunha and Orlikowski, 2008). According to "2008 Online Journalism Award" by Online News Association, large online discussion forum sites such as Beliefnet.com, Chron.com, and NYTimes.com were selected for their effective management of online commentary. As evidenced by such examples, the importance of online commentaries is on the rise recently. Although there is a great deal of research investigating the impact of online discussion forums on organizational change (Cunha and Orlikowski, 2008), intention of participation (Yang, Li, Tan, and Teo, 2008), learning (Thomas, 2002), and corporate reputation (Clack, 2001; Park and Lee, 2007), there has been no systematic

assessment of online commentaries' role in framing users' information processing and experiences of bias processing.

In light of this, we propose that online commentary has a crucial impact on users' information processing, and also that there are psychological differences in the characteristics of such process. This study will specify the role of online commentary, and it will also test this empirically. It seeks to answer following questions: (1) Is there any information distortion behaviour depending on the direction of online commentaries (positive vs. negative)? (2) What kinds of differences are there for information distortion by users' motivational orientation? (3) Does the characteristic of information affects these biased information processing?

In what follows, we first consider some previous research on information distortion and selective exposure to information, particularly those studies examining the people's psychological information processing. We then describe the setting of our research study and the methods we use to connect these cognitive processing to the context of online discussion forums. We next discuss the information processing style of users in terms of regulatory focus, which we identified as a moderator for the valence of online commentaries and informational characteristics. We also discuss our finding that user's information distortion by online commentaries was induced differently depending on users' motivational orientation and informational characteristics. We conclude the paper by examining the research implications of the impact of online commentaries to the information processing during information adoption by the user.

2 THEORETICAL BACKGROUND AND HYPOTHESES

2.1 Information distortion and selective exposure to information in online discussion forums

As noted earlier, we expected that users of online discussion forum may distort their preference toward information by adopting online commentaries. It is widely known that after a decision is made, people distort information in favor of the chosen alternative in order to reduce cognitive dissonance (Elliot and Devine, 1994; Fazio and Cooper, 1983). In online discussion forum, users may seek online commentaries that confirm their choice and depreciated encountered commentaries that oppose it. Investing these phenomena, we lift up online commentaries to the surface of theoretical context.

Information distortion is defined as a change in the forms, meaning and/or availability of information (O'Reilly, 1978; Huber, 1982). Larson and King (1996) mentioned that tendency to suppress or alter 'bad news', or to exaggerate and circulated 'good news'. Also, systemic filtering of unfavourable information is referred to information distortion. More specific, three types of information distortion are identified. One type of information distortion occurs when the sender does not intend to distort information but, because of an inadvertent change in form, meaning and/or availability, information becomes inaccurate. This type of distortion is referred to as unintentional distortion. Information distortion can also be malicious in nature. Departments or individuals who do not get along may distort information to mislead or satisfy their own objectives at the expense of the other party. This type of information distortion is referred to as malicious intentional distortion. A third type of information distortion occurs when information is intentionally distorted, either for the benefit of the receiver or for the benefit of both the sender and the receiving party. This third type of distortion is referred to as well-meaning intentional distortion. Users in online discussion forums may have this third type of information distortion. They are likely to find online commentaries for benefit of them to reduce cognitive dissonance. What might cause users to distort information in online discussion forum? To answer this question, we examined the effects of valence of online commentary (positive or negative) on users' selective exposure to information.

People often systematically prefer information that is consistent with their beliefs, attitudes, or decisions and, in contrast, neglect inconsistent information. This phenomenon is called selective exposure to information, and online discussion forum users are likely to select information which their preference matches with online commentary. A great deal of empirical research on selective exposure to information has been conducted in the context of dissonance theory (Festinger, 1957; Frey, 1986; Jonas, Schulz-Hardt, Frey, and Thelen, 2001). Dissonance theory suggests that subsequent to having made a decision, decision makers experience cognitive dissonance because of the salient negative aspects of the selected alternative and the salient positive aspects of the rejected alternative. One prominent means of reducing dissonance is selective exposure to consistent information (Festinger, 1957). Previous research has revealed that such biased information-search processes occur in different contexts, including attitudes (Lundgren and Prislin, 1998), self-serving conclusions (Frey, 1981; Holton and Pyszczynski, 1989), and online news (Best, Chmielewski, and Krueger, 2005). Most important to the focus of the online discussion forums, biased information processing has also been consistently observed following individual and group decisions (Jonas, Schulz-Hardt, Frey, and Thelen, 2001; Schulz-Hardt, Jochims, and Frey 2002). In the context of online discussion forums, we expected that selective exposure to information has also been consistently observed between positive-framed online commentaries and negative-framed online commentaries. Moreover, we proposed that the valence of online commentary (positive vs. negative) can affect users' information preference, and these effects can be moderated by users' motivational orientation and informational characteristics.

2.2 Regulatory focus theory and informational characteristics

For the past few decades, many researches in IS has been focused on users' motivational factor which can explain their information processing in many contexts (Gill, 1996; Couger, Zawacki, Oppermann, 1979; Burton, Chen, and Grover, 1992). In this research, we focused on online discussion forum users' information processing style, specifically motivational orientation factor: self-regulatory. Regulatory focus theory (Higgins, 1997) offers an insight into this motivational difference of informational processors. Regulatory focus posits two motivational orientations: a promotion focus and a prevention focus. Promotion-focused people emphasize aspirations and achievements and focus on the presence and absence of positive outcomes. Prevention-focused people are concerned with responsibilities and safety and focus on the presence and absence of negative outcomes (Shah, Higgins, and Friedman, 1998). In accord, Idson, Liberman, and Higgins (2000) found that promotion-focused people exhibited greater "eagerness" in working toward a gain than guarding against a nongain, while prevention-focused people displayed greater "vigilance" in preventing a loss than working toward a nonloss. In this regard, in online discussion forums, promotion-focused users display greater eagerness in striving toward a positive outcome (positive online commentaries) than away from its absence (negative online commentaries). Further, consistent with these users' desire to secure hits and avoid misses, positive online commentaries in online discussion forums allows for an inclusion of consistent original information. In contrast, prevention-focused users are concerned about negative outcome (negative online commentaries) more intensely than they are concerned with its absence. They focus on identifying correct rejections and on avoiding incorrect "hits." Considered in this framework, we address that these motivational differences can induce different bias information processing and selective exposure to information in online discussion forums.

As evidenced by their endorsement of multiple alternatives and placing lower weight on prior choices in making future decisions, promotion-focused users should display a lower tendency to allow their evaluation of one information to bias the other information's evaluation. In contrast, based on their tendency to entertain fewer hypotheses and to place greater weight on prior choices when making future decisions, prevention-focused users should allow their evaluation of negative information to influence their evaluation of the other. Thus, we expect that the tendency of prevention-focused users to allow their rating of online commentaries to affect the overall information's rating is due to the possibility that they have a greater preference for consistency than do promotion-focused users. Preference for consistency (PFC), the "desire to be and to be seen as consistent" (Guadagno, Asher,

Demaine, and Cialdini, 2001), leads users with a higher PFC to weight previous expectations or choices more when engaged in subsequent decisions. Further, low-PFC users seen open and oriented to the new, in ways that are relatively unconstrained by the established (Cialdini, Trost, and Newsom, 1995). Related to regulatory focus, Higgins (1996) suggests that prevention-focused users' tendency to narrow alternatives "raise the intriguing possibility that self-consistency motivation is linked to the prevention focus of self-regulation." So, we expect differences in PFC associated with different regulatory foci to manifest different level of information distortion in online discussion forums by online commentaries.

H1: Promotion-focused users are more likely to distort online information than prevention-focused users.

In line with consumer behaviour literature that distinguishes between utilitarian and hedonic products (Hirschman and Holbrook, 1982) and applying literature to IS context (Heijden, 2004), we can classify these types of information in online discussion forums. There are two kinds of information in online discussion forums: utilitarian information and hedonic information. Consistent with previous research in informational characteristic, we use the term "utilitarian information" to refer to the functional, instrumental, practical benefits of informational characteristic, and we use the term "hedonic information" to refer to its aesthetic, experiential, and enjoyment-related information (Batra and Ahtola, 1990; Chitturi, Raghunathan, and Mahajan, 2007; Dhar and Wertenbroch, 2000). In the context of online discussion forums, for example, the economic theme and health information can be utilitarian information, whereas aesthetic appeal from entertainment news. The consumer behaviour literature demonstrates that what specifically determines intention to consume depends on the utilitarian or hedonic nature of the product (Babin, Darden, and Griffin, 1994; Holt, 1995). We develop a parallel argument that what shapes information distortion is dependent on the utilitarian or hedonic nature of information in online discussion forums.

There is converging evidence that the types of goals people to be fulfilled by the utilitarian dimension of a product are different from those they seek from the hedonic dimension (Chernev, 2004). Specifically, whereas people expect the fulfilment of prevention goals on the utilitarian dimension, they expect the fulfilment of promotion goals on the hedonic dimension (Chitturi, Raghunathan, and Mahajan, 2007). According to the regulatory focus theory, prevention goals are those that ought to be met, such as "behaving in a safe and secure manner" and "being responsible." Fulfillment of prevention goals in the context of online discussion forums eliminates or significantly reduces the probability of painful information such as negative online commentaries, thus making overall evaluation of information that results from fulfilment of prevention goals. For example, in the case of economic news information, prevention goals might be served by its useful features or helpful online commentaries. Conversely, promotion goals are those that a person aspires to meet, such as "fun or enjoyable information." Fulfillment of promotion goals in the hedonic information such as entertainment news significantly increases the probability of a pleasurable experience, thus enabling users to distort information that result from the adoption of online commentaries. Therefore, following hypotheses are proposed that the different level of information distortion depending on informational characteristic (hedonic vs. utilitarian) and users' regulatory focus (prevention vs. promotion). Also, the proposed conceptual framework in Figure 1 captures the relationship among hedonic versus utilitarian information, the impact of online commentaries, and users' regulatory focus, respectively.

H2: In case of hedonic information, information distortion will be stronger for promotion-focused users as compared to prevention-focused users.

H3: In case of utilitarian information, information distortion will be stronger for prevention-focused people as compared to promotion-focused users.

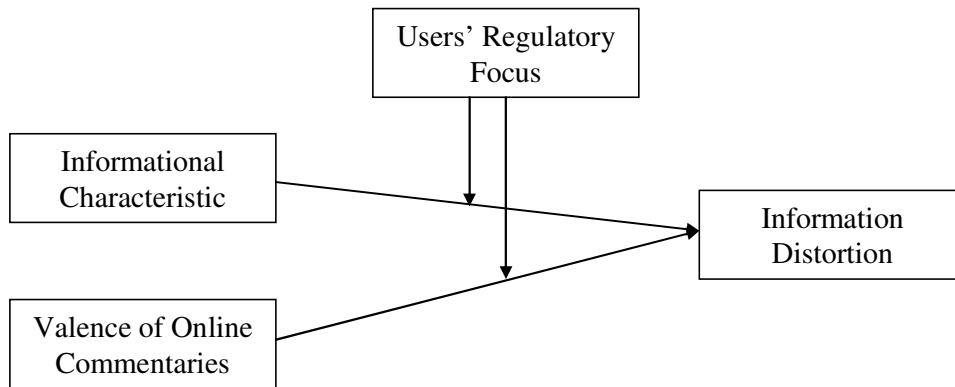


Figure 1. *Proposed Conceptual Framework: Information Distortion in Online Discussion Forums*

3 RESEARCH DESIGN AND METHOD

3.1 Design, Subjects, Experimental System, and Procedure

The present study uses a $2 \times 2 \times 2$ between-subjects experiment manipulating regulatory focus (promotion vs. prevention), valence of online commentaries (positive vs. negative), and information characteristic (utilitarian vs. hedonic). Two hundred seven college students participated in the study voluntarily. Their average age is 21.8 and 54.2% is male. Most of the subjects had participated in online discussion forum such as beliefnet.com or NY Times.com. Subjects were randomly assigned to each of the cells in the factorial design, and they participated in different experimental conditions in a single session. The original information used in the experiment were two news manipulating information characteristic. Consistent with previous researches, utilitarian information contains useful and helpful reports about economic phenomenon. In contrast, hedonic information contains interesting and exciting reports about entertainment gossip. For the experiment, eight-independent virtual online discussion forum sites were constructed for each condition. The online discussion forum sites contained both original news information and the set of online commentaries. This experimental system encapsulates the attributes of a real online discussion forums sites. In an experiment, the subjects followed instructions that address a scenario manipulating different regulatory foci. Then original news information was provided to each group, and measured their evaluation about news. After measuring prior evaluation, subjects received online commentaries together with original news information, and measure their evaluation again. Subsequently, the subjects gave an answer questions about preference for consistency, manipulation checks, in regular sequence.

3.2 Independent Variables

3.2.1 Information characteristics (Utilitarian vs. Hedonic)

Based on the news information from a real online discussion forum, six candidates for news information were collected. To increase face validity, twelve subjects participated in a pre-test that checks whether this information was perceived in the appropriated dichotomy (utilitarian vs. hedonic). In the main experiment, relatively different news information was used. Utilitarian information was manipulated with instrumental and functional topic such as economic news, whereas hedonic information provide fun, pleasure, and excite topic such as entertainment gossip. This relative hedonic or utilitarian nature of information is consistent with prior research (Batra and Ahtola, 1990; Dhar and Wertenbroch, 2000). Each online news contained an attribute of information such as instrumental or

pleasure topics, and the length of information was set at fifteen lines. The length of each news information was controlled to avoid the effects of information quantity, and to focus on the effects of information characteristic. Also, original news information provided neutral opinion to focus on the effects of the valence of online commentaries.

3.2.2 *The valence of online commentaries (Positive vs. Negative)*

Before manipulating the valence of online commentaries, forty candidates for online commentaries were collected from a real online discussion forum. Each online commentaries' length was 2 lines and consist of 40 words. A focus group interview organized with ten people who frequently use online discussion forum was performed. In the FGI, subjects were asked the degree of strength that how much online commentaries agree to original news or not. After the FGI, we calculated strength of online commentaries with nine-point scale (where -4 = extremely opposite, 0 = neutral, and 4 = extremely agree), and among same strength-commentaries, finally five positive online commentaries and five negative online commentaries were selected. The positive valence of online commentaries was organized with seven positive commentaries and three negative commentaries, and negative valence of online commentaries was organized vice versa. Figure 2 shows example of experimental online discussion forum screen.

3.2.3 *Regulatory Focus (Prevention vs. Promotion)*

To manipulate regulatory focus, we provide a role-play for subjects in the introductory session. This manipulation is very much like that of situational regulatory focus in past studies (Jain, Lindsey, Agrawal, and Maheswaran, 2007; Shah, Higgins, and Friedman, 1998). Regulatory focus was manipulated first by requiring subjects to unscramble six jumbled words that were actually names of commonly used cosmetic brands. Prevention condition subjects were informed: "Each incorrectly unscrambled name loses you 2 point. If you do not get a name wrong, you won't lose 2 points. Your goal is to lose as few points as possible by minimizing the number of names you get wrong. For every brand name that you wrong, you will lose 2 point. For every brand name that you don't get wrong, you won't lose 2 point." In contrast, promotion condition subjects were informed: "Each correctly unscrambled name gains you 2 points. If you do not get a name correct, you will not gain 2 points. Your goal is to gain as many points as possible by minimizing the number of names you get right. For every brand name that you get right, you will win 2 points. For every brand name that you do not get right, you won't win 2 points." Due to the dichotomized regulatory focus, prevention-focused subjects processed the information both original news and online commentaries more carefully via their concern about the presence of negative online commentaries, but promotion-focused subjects processed the information both original news and online commentaries more carefully via their concern for positive online commentaries. This is consistent with regulatory focus theory.

3.3 **Control Variables and Dependent Variable**

Control variables: Experimental systems should consider other effects such as the characteristics of subjects and exogenous stimuli on all matters. It could be affected by the tendency of reliance on online commentaries, general attitude toward the online discussion forum. To focus our independent variables and increase internal validity, the following methods were employed to control confounding effects on evaluation of information. First, the characteristics of subjects comprising individual differences such as online searching styles and personality were controlled by allotting subjects to each condition at random. Second, this present experiment used imaginary online discussion forums' names. If we consider the online discussion forums' reputation, many compounding effects are revealed. An online discussion forum which has a strong reputation may tempt users, and they only regard the reputational cue as serious. In this case, since the online discussion forums' role (i.e. informational role) cannot work, the work retailer is probably unsuitable. Finally, prior knowledge

about original news information, the degree of reliance on online commentaries was measured by survey items in experiments, and they were used as control variables in an ANOVA analysis.

Dependent variable: Preference change toward information used in dependent variable (Russo, Medvec, and Meloy, 1996). It indicates the level of information distortion, and was measured by the difference between before and after the evaluation of information. First, participants indicated their evaluation of online news on three scales anchored ‘favorable/unfavorable,’ ‘good/bad,’ and ‘desirable/undesirable.’ And then, participants were asked their evaluation on both online news and according online commentaries. Preference change toward information was developed by subtracting next evaluation to prior evaluation.

The screenshot shows a web page titled "Online Discussion Forum" with a navigation bar containing links for "Community", "Blogs", "Video", "Newsletters", "Sign Up", and "Login". Below the navigation bar is a menu with categories: "Home", "Faiths & Prayer", "Inspiration", "Health", "Entertainment", "Holistic Living", "Love & Family", and "News". The main content area features a section titled "Oil and Gasoline" with two paragraphs of text. Below the text is a box labeled "10 Comments" containing a list of ten user comments and their names: Juliet, Sam, Dan, Lima, Joe, John, Mike, Bill, Tom, and Shah.

Oil and Gasoline

In 1999, the price of oil hovered around \$16 a barrel. In July 2008, it reached a peak of \$147 a barrel. In the months that followed, as fears of a global recession grew, prices plunged to the \$75 a barrel range, a roller coaster ride that left both producers and consumers confused and wrung out. Prices were still far higher than they had been a few years earlier, but oil-producing countries that had reshaped their economies around the huge influx of revenues faced a suddenly altered landscape.

Many factors contributed to the long buildup between 1999 and 2008, including the relentless growth of the economies of China and India and widespread instability in oil-producing regions, including Iraq and Nigeria's delta region. The triple-digit oil prices that followed appeared to redraw the economic and political map of the world, challenging some old notions of power. Oil-rich nations made enjoying historic gains and opportunities, while major importers — including China and India, home to a third of the world's population — confronted rising economic and social costs.

10 Comments

Well, this is quite interesting topic.. Oil price changes every day, month, year. You never know, what price will be tomorrow, the day after tomorrow, no one knows..	Juliet
Yea, many people all around the globe would like to know the answers. Let me guess, top price is a price, that people won't ever get beyond to pay for.	Sam
It depends, on what are those oil companies which buy oil and sell it to someone else able to undergo. Lets say, they will buy oil, until the market needs oil	Dan
I strongly disagree with the writer. The government doesn't need any more of our money and it has no right to use taxes control what we spend our money on.	Lima
Are they able to keep their position against those alternative sources...? Hard to say but those companies will not want to loose their position in the world economy.	Joe
When you are thinking that you prefer train or bus instead of your own car because of oil price, that is the top price for you. Each of us has his own top price.	John
It's true, and that is the root of all current trouble. when public has reached that "top price" of their own, they simply do not have money left to spend.	Mike
Back to the same point, producers are not that greedy or they would have doubled the price today or reduced production to half to maintain the prices of July.	Bill
its a very long and complicated debate on what the oil prices really depend on. but interesting to know other point of views, so here is one.	Tom
No only you go to work with your car...You have the whole transportation of goods...more taxes more prices to go up...the spiral dawn is endless....	Shah

Figure 2. *The experimental online discussion forum site (example of utilitarian information and the negative online commentaries condition)*

4 RESEARCH RESULTS

4.1 Manipulation Checks

To check the manipulation of informational characteristic, we used the perceived measure adopted from prior research (Batra and Ahtola, 1990). Informational characteristic was measured using four seven-point semantic differential scales (the utilitarian component by the items useful/useless, and beneficial/harmful; the hedonic component by the items pleasant/unpleasant, and nice/awful). The ANOVA analysis indicated that there are significant differences between the utilitarian information condition and the hedonic information condition [for utilitarian component measure, $M=4.68$ vs. 2.41 , $F(1,206)=167.295$, and for hedonic component measure, $M=5.31$ vs. 1.91 , $F(1,206)=370.69$]. The subjects also checked two items designed to check neutrality of original news information (“This online news is neutral,” and “This online news contained both support arguments and counter argument.”). The ANOVA results show that the neutrality of original news information was also successfully manipulated [$M(\text{utilitarian information})=3.80$ vs. $M(\text{hedonic information})=3.24$, $p>0.1$]. Then, as a check on the valence of online commentaries, we measured two items: “the online commentaries about this online news are mainly supportive/opposite (reversed coding).” Using this method, the valence of online commentaries was manipulated successfully [for utilitarian news information, $M(\text{positive commentaries})=4.68$ vs. $M(\text{negative commentaries})=2.41$, $F(1,206)=167.295$; for hedonic news information, $M(\text{positive commentaries})=5.31$ vs. $M(\text{negative commentaries})=1.91$, $F(1,206)=370.69$]. Finally, the efficacy of the regulatory focus manipulation was assessed by asking subjects to indicate the “extent to which you focused on scoring more points when playing the brand name quiz” and “the extent to which you focused on not losing any points when playing the brand name quiz.” The ANOVA tests confirmed that promotion-focused (prevention-focused) subjects concentrated more on winning (not losing) points [$M(\text{promotion/score more})=5.09$, $M(\text{promotion/not loss})=4.50$, $F(1,206)=6.96$; $M(\text{prevention/score more})=3.39$, $M(\text{prevention/not loss})=4.93$, $F(1,206)=53.05$]. Thus, the manipulations were successful.

4.2 Hypothesis Testing

The preference change toward information (Cronbach’s Alpha = 0.84) was calculated as a difference between after and before evaluation for information (where -3 indicated “strongly disagree,” 0 indicated “neutral,” and 3 indicated “strongly agree”). Table 3 presents the mean and standard deviation of dependent measures for each cell. The dependent measures were analyzed in a series of 2 (Informational characteristic) \times 2 (The valence of online commentaries) \times 2 (Regulatory focus) ANCOVA. The ANCOVA results are in Table 4. The covariate variables were not significant. So, exogenous factors were controlled successfully.

Informational Characteristic		Hedonic Information		Utilitarian Information	
Regulatory Focus		Promotion	Prevention	Promotion	Prevention
The Valence of Online Commentaries	Negative	-0.23 (0.71) n=52	-0.09 (0.68) n=52	-0.17 (0.86) n=52	-0.28 (0.58) n=52
	Positive	0.31 (0.65) n=50	0.08 (0.74) n=53	0.14 (0.43) n=50	0.23 (0.73) n=53

Table 3. Descriptive statistics of Preference change toward Information

Effect	F-value	Sig.
Prior Knowledge about original news information	1.157	0.341

Degree of Reliance on online commentaries	1.824	0.177
Regulatory Focus	5.323**	0.022
Informational Characteristic	0.052	0.820
The Valence of online commentaries	5.711**	0.018
Regulatory Focus × Informational Characteristic	0.682	0.410
Regulatory Focus × The Valence of online commentaries	0.093	0.761
Informational Characteristic × The Valence of online commentaries	0.450	0.504
Informational Characteristic × Regulatory Focus × The Valence of online commentaries	4.178**	0.043

*: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.001$

Table 4. ANCOVA test results

The analysis indicated the presence of a significant main effect of users' regulatory focus [$F(1,206)=5.323$, $p < 0.05$]. It means that promotion-focused users more distort information than prevention-focused users. As suggested earlier in this paper, the preference for consistency (PFC) of users can affect their bias information processing. To validate and understand the underlying mechanism of plausible explanations, simple regressions are conducted both promotion-focused users and prevention-focused users. Consistent with the expected regulatory focus-PFC relationship, analysis revealed that, promotion-focused subjects are likely to distort information with no effect of PFC on preference change [$t(1,101)=0.515$, $\beta = 0.051$, $p > 0.1$]. In contrast, prevention-focused led subjects to less distort information with marginal significant effect of PFC on preference change [$t(1,104)=1.673$, $\beta = 0.163$, $p < 0.1$]. Therefore, Hypothesis 1 was accepted.

Also, there is a significant main effect of the valence of online commentaries [$F(1,206)=5.711$, $p < 0.05$]. It means that users in online discussion forum are affected their attitude toward information by online commentaries generated by other users, and form their preference based on these online commentaries. The set of positive-direction online commentaries lift up users' evaluation on information, but the set of negative-direction online commentaries reduce users' evaluation on information irrespective of informational characteristics.

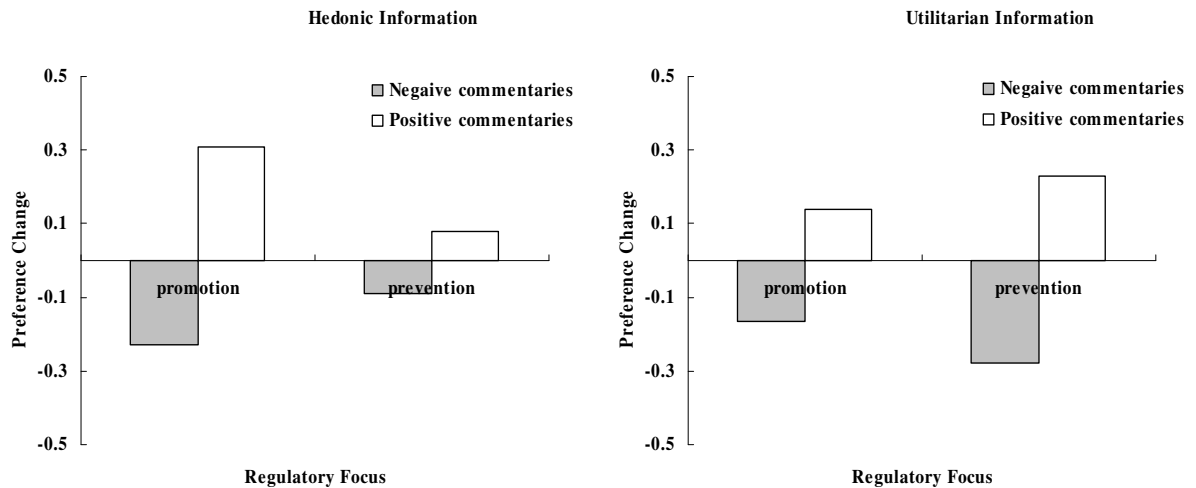


Figure 5. Three-way Interaction for preference change toward information

We further explored the different effects of the manipulation of users' regulatory focus and the valence of online commentaries under hedonic and utilitarian information conditions. These analyses were possible because the three-way interaction effect of informational characteristic × regulatory focus × the valence of online commentaries was significant [$F(1,206)=4.178$, $p < 0.05$]. For hedonic information, promotion-focused subjects showed greater tendency that change their preference by

positive and negative online commentaries [$F(1,101)=7.652, p<0.01$]. But, for prevention-focused subjects, there are no significant preference change depending on the valence of online commentaries [$F(1,104)=0.290, p>0.1$]. These results support our predictions that information distortion can be stronger for promotion-focused users than for prevention-focused users in case of hedonic information (see Figure 5 on the left). Accordingly, Hypothesis 2 was accepted.

Under utilitarian information, in contrast, prevention-focused subjects showed greater change of preference by the direction of online commentaries [$F(1,104)=7.24, p<0.01$]. For promotion-focused subjects, there are also marginal preference change [$F(1,101)=2.58, p<0.1$]. But, their information distortion is less strong compared with that of prevention-focused subjects (see Figure 5 on the right). Such results might be interpreted as suggesting the difference pattern of information distortion in utilitarian information depending on users' self-regulatory. Specifically, information can be stronger for prevention-focused users than promotion-focused users in case of utilitarian information. Thus, Hypothesis 3 was accepted.

5 CONCLUSION AND LIMITATIONS

The online discussion forum has increasingly been recognized as a useful space that facilitates virtual interaction and forms online criticism. We focused on the question of users' information preferences change due to specific direction of online commentaries in order to investigate the influence of users' motivational orientation and the informational characteristics in online discussion forums. The empirical results indicated that the informational characteristic and the valence of online commentaries were important because they change the preference to the given information, and these patterns were different depending on users' regulatory focus. The primary insights that this research provides are as follows: (1) Overall, promotion-focused users distort their preference more than prevention-focused users do when adopting online commentaries, (2) Information that meets or exceeds users' hedonic needs and fulfills promotion goals enhance users' information distortion, and (3) Information that meets or exceeds users' utilitarian needs and fulfills prevention goals enhance users' information distortion in online discussion forums. Furthermore, the research finds that the online commentaries have significant impact on users' preference change to information. For the two decomposed concepts of the regulatory focus, promotion-focused users react more to the valence of online commentaries in case of providing hedonic information. In contrast, prevention-focused users are more sensitive to the valence of online commentaries when utilitarian information is presented. We establish a causal asymmetric link between framing and focus that connects information distortion of utilitarian information and hedonic information. Furthermore, we identify the process underlying this different information distortion. The higher PFC associated with prevention-focus induces little preference change to information. But, the lower PFC associated with promotion-focus allows for more preference change to information. PFC may also play a role in information distortion phenomenon occurring in online discussion forum such as the prevention-focused users prefer to the status quo and the notion that promotion-focused users entertain multiple hypotheses.

For theoretical contribution, building on the work of Yang, Li, Tan, and Teo (2007), Cunha and Orlikowski (2008), we proposed that sophisticated information processing in online discussion forums. Our examination of the information distortion in online discussion forum by online commentary has implications for the online communicational and educational literature in that it provides evidence for users' biased information processing. To the best of our knowledge, this is the first study to demonstrate such a correspondence among informational characteristics (hedonic vs. utilitarian), the valence of online commentaries (positive vs. negative), and users' regulatory focus (prevention vs. promotion). The research findings would have significant implications for managers in online discussion forums. Practically, this study's major results emphasize the importance of proper management of online commentaries. Because of negative aspects of unintended online criticism, managers and users are often compelled to process among various attributes of information. Since online commentaries are differently processed depending on users' motivational orientation, managers

can use this result strategically as a new channel that provides a bridge between users and online information providers.

The present study has several limitations. First, the reputation of the forum itself was not considered. Since users did not have a holistic valuation of the reputation of the online discussion forums, the effect of online discussions' reputation could be explained by additional study. Second, in this study, the quantity of online commentaries was fixed to avoid unintended effects. It could be possible that the quantity of online commentaries act as a signal for the popularity of the information. Further research considering this issue should be conducted. Finally, regulatory focus was manipulated by differing situational role-playing. Individual's regulatory focus can be either situational or chronic. From this point of view, users' chronic regulatory focus needs to be considered in the future study. In spite of these limitations, the result described in this study shows that online news and related online commentaries need to monitor closely the extremely negative or defamatory postings in their online discussion forums in order to minimize possible spillover of negative sentiments from online discussion forum users to others, and also provides a rationale for online discussion forums to offer venue for online public discussions.

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