Consumer reviews: reviewer avatar facial expression and review valence

Mira Lee
*School of Business Administration, Chung-Ang University,
DongJak-Gu, South Korea*
Mikyoung Kim
*Cheil Communication Sciences Institute, Cheil Worldwide, Seoul,
South Korea, and*
Wei Peng
*Department of Telecommunication, Information Studies & Media,
College of Communication Arts and Science, Michigan State University,
East Lansing, MI, USA*

Abstract

Purpose – The purpose of this paper is to explore how the facial expression of the reviewer's avatar interacts with the valence of the consumer review to influence consumer purchase decisions.
Design/methodology/approach – A 2 (facial expression of the reviewer's avatar) $\times$ 2 (valence of the consumer review) between-subjects online experimental design was used.
Findings – It was found that when the consumer review was positive, participants exposed to the reviewer's angry-looking avatar were more likely to attribute the review to the product's performance than those exposed to the happy-looking avatar. The causal attribution toward product performance, in turn, influenced the strength of intention to purchase the brand positively. When the consumer review was negative, however, there were no differential effects between the happy-looking and the angry-looking avatars.
Originality/value – This study contributes to the literature on consumer reviews by identifying an important source characteristic that consumers consider when processing consumer reviews – the facial expression of the reviewer's avatar.
Keywords Consumer reviews, Avatar, Facial expression, Causal attribution, Consumer behaviour, Consumers
Paper type Research paper

Introduction

Consumer-generated product reviews (hereafter consumer reviews) make it easier than ever before for consumers to learn more about products from other consumers. Previous research has shown that consumer reviews influence consumer product evaluations and sales; further, negative reviews have greater influence than positive reviews (Chevalier and Mayzlin, 2006; Doh and Hwang, 2009; Sen and Lerman, 2007).

Consumer reviews are usually posted anonymously and shared among strangers (Sen and Lerman, 2007; Steffes and Burgee, 2009). Perhaps to deal with the anonymous nature of consumer reviews, a growing number of web sites, such as amazon.com, are allowing reviewers to create their personal profiles and make them available along

with their consumer reviews. These personal profiles of reviewers can be used as inference cues to help consumers perceive a person who wrote a consumer review.

Among different types of information about reviewers, some web sites, such as Yahoo! Answers, allow people to present their own avatars, "computer generated visual representations of people" (Nowak and Rauh, 2005, p. 153), along with their postings. Researchers have suggested that people perceive other people based on the avatars other people use in "non-acquaintance" situations (Nowak, 2004; Talamo and Ligorio, 2001). Of the various customizable features of avatars (e.g. facial expressions, skin color, hairstyle, and clothes, etc.), emotional facial expressions of the avatar may play an important role in helping consumers make inference about dispositional traits of avatar users. Research has shown that people tend to infer the traits of others based on their emotional facial expressions (Arya *et al.*, 2006; Montepare and Dobish, 2003).

This study explores how the facial expression of the reviewer's avatar interacts with the content of the consumer review to influence consumer purchase decisions. Of particular interest is to examine how consumers respond to a situation where the facial expression of the reviewer's avatar and the content of the consumer review seem to match or they do not seem to match. To create a match or mismatch situation, this study focusses on the facial expressions of two emotions, happiness and anger, among several "universal" facial expressions that reveal emotions such as happiness, anger, fear, sadness, surprise, and disgust (Ekman, 1999), and the valence of the consumer review (i.e. positive or negative). Insights regarding these interaction effects on consumer purchase decisions can be drawn from Kelley's (1973) discounting and augmentation principles and Eagly and her colleagues' attributional analysis in terms of expectancies (Eagly and Chaiken, 1975; Eagly *et al.*, 1978). Additionally, this study examines the mediating roles of causal attributions on the interaction effect of the facial expression of the reviewer's avatar and the review valence on consumer purchase decisions.

The valence of a consumer review

The valence of reviews (i.e. positive vs negative) has been found to influence consumer product judgments (Chevalier and Mayzlin, 2006; Chiou and Cheng, 2003; Doh and Hwang, 2009; Lee *et al.*, 2009; Sen and Lerman, 2007). Researchers in various disciplines have found the negativity effect, a phenomenon where negative information has a stronger impact than positive information on evaluations. Specifically, in the context of consumer reviews, Chevalier and Mayzlin (2006) found that negative reviews (i.e. one-star reviews) had a greater impact on book sales than positive reviews (i.e. five-star reviews).

One of the most frequently discussed explanations for the negativity effect is category diagnosticity, "a behavioral cue's utility in discriminating between alternative categories" (Skowronski and Carlston, 1989, p. 137). Previous research has argued that negative information is typically more diagnostic in categorizing the target into a certain category than positive information (Skowronski and Carlston, 1989). For example, in the context of consumer reviews, negative reviews about a product help consumers categorize the product into a low-quality product more so than positive reviews help them categorize the product into a high-quality product (Bone, 1995; Herr *et al.*, 1991).

The facial expression of emotion on the reviewer's avatar

When interacting with other people, especially strangers, in online communications, people often reveal their identity through avatars (Kang and Yang, 2006; Waskul and Douglass, 1997). Regardless of whether avatars reflect people's real-life identities or not,

it is important to understand that people use avatars as a tool for perceiving and evaluating others in non-acquaintance situations (Nowak, 2004; Talamo and Ligorio, 2001).

When interacting with others in non-acquaintance situations, people can perceive others' demographics or physical appearance based on their avatars. Among the various customizable features of avatars, emotional facial expressions may play a significant role when people form an impression about dispositional traits of others. Previous research has found that people infer the personality traits of others based on their facial expressions in non-acquaintance situations (Arya *et al.*, 2006; Damhorst and Reed, 1986; Hess *et al.*, 2000; Knutson, 1996; Montepare and Dobish, 2003). For example, Knutson (1996) found that participants inferred a target individual who has happy facial expressions as high in affiliation, while judging the target with angry facial expressions as low in affiliation, but high in dominance.

Based on the preceding discussions, we expect that people will form an impression about dispositional traits of reviewers based on their avatars' facial expressions of emotions. As stated earlier, this study focusses on the facial expressions of two emotions, happiness and anger. We expect that people will judge a reviewer who has a happy-looking avatar as high in agreeableness (e.g. considerate and kind to almost everyone), but rate a reviewer having an angry-looking avatar as low in agreeableness. Thus:

H1. A reviewer with a happy-looking avatar will be perceived as higher in agreeableness than a reviewer with an angry-looking avatar.

The interaction between reviewer avatar facial expression and review valence

Attribution theory explains the process by which people draw inferences about causes of an action (Heider, 1958; Jones and Davis, 1965; Kelley, 1973). The theory has been extended further to explain how people's causal inferences influence decision making or persuasion (Eagly and Chaiken, 1975; Eagly *et al.*, 1978; Folkes, 1988; Freling and Dacin, 2010; Groza *et al.*, 2011; Laczniak *et al.*, 2001; Sen and Lerman, 2007; Vlachos *et al.*, 2009). Attribution theory posits that people usually infer different types of causes for an action. For example, some researchers suggest that people usually infer internal (i.e. personal attitudes or dispositions) or external (e.g. situational pressures) causes for an action (Jones and Davis, 1965; Heider, 1958).

In the context of consumers' product recommendations, previous research has demonstrated that consumers attribute other people's product recommendations to different types of causes: product-related cause (e.g. product's performance), communicator-related cause (e.g. a reviewer's personality traits), or situation-related cause (e.g. circumstances) (Laczniak *et al.*, 2001; Lee and Youn, 2009; Mizerski, 1982; Sen and Lerman, 2007). The discounting principle of attribution theory suggests that "the role of a given cause in producing a given effect is discounted if other plausible causes are also present" (Kelley, 1973, p. 113). For example, when consumers suspect that the reviewer wrote the positive review because s/he is someone who always says positive things about people or products, then a product's performance as a cause for that positive review is discounted (Laczniak *et al.*, 2001). Subsequently, the persuasiveness of the consumer review decreases. On the other hand, the augmentation principle suggests that when an alternative cause is present and it serves to suppress the action, then the presence of such alternative cause will enhance the role of the given cause in the given action (Kelley, 1973). For example, when consumers suspect that a reviewer who always finds fault with people

or products wrote a positive review about a given product, the reviewer's critical personality, which may have prevented the reviewer from writing the positive review, may heighten the role of product performance as a plausible cause in producing the positive review. In turn, the persuasiveness of the consumer review increases.

Further, several researchers explain causal inferences in terms of expectancies (Baum and Groeling, 2009; Eagly and Chaiken, 1975; Eagly *et al.*, 1978; Vermeulen and Seegers, 2009; Wood and Eagly, 1981). Specifically, it has been suggested that, the more a communicator's position advocated in the persuasive message is expected based on the communicator's dispositional characteristics, the more recipients of the message will discount factual evidence as a plausible cause, and the less persuasive will be the message. On the other hand, the more the communicator's persuasive message is unexpected based on the communicator's personal characteristics, the more will recipients of the message attribute the message to factual evidence, and the more persuasive will be the message. In the context of product reviews, Vermeulen and Seegers (2009) found that among several hotel reviews, including positive and negative reviews written by a non-expert (i.e. a secretary) and reviews by an expert (a former hotel manager and six-year veteran hotel reviewer), the negative review by the expert was least persuasive. The researchers speculated that this finding might have occurred because participants expected the professional hotel reviewer to write the critical review, decreasing the persuasiveness of the review.

The discounting and augmentation principles and the attributional analyses in terms of expectancies help us understand how the facial expression of the reviewer's avatar interacts with the valence of the consumer review to influence consumer purchase decisions. Specifically, when the consumer review is positive, consumers exposed to the reviewer's happy-looking avatar tend to perceive that the reviewer wrote the positive review because she is someone who tends to talk positively about things or people. Due to the confirmed expectancy of a positive review on the basis of the reviewer's inferred trait, those exposed to the reviewer's happy-looking avatar tend to discount product performance as a plausible cause for the positive review and not to be influenced by the product review, consistent with the discounting principle. On the other hand, consumers exposed to the reviewer's angry-looking avatar tend to perceive that the reviewer wrote the positive review even though she is someone who finds fault with things or people. Given this disconfirmed expectancy, those exposed to the reviewer's angry-looking avatar tend to believe product performance caused the positive review and be influenced by the product review, consistent with the augmentation principle. However, when the consumer review is negative, the negative review is so diagnostic that the facial expression of the reviewer's avatar will have minimal influence on consumers' causal attributions and purchase decisions. Thus:

H2. The effect of the avatar's facial expression on causal attributions will occur only for the positive review such that, when the consumer review is positive, consumers exposed to the reviewer's angry-looking avatar (vs the reviewer's happy-looking avatar) will be less likely to attribute the review toward the reviewer's dispositional characteristic.

H3. The effect of the avatar's facial expression on causal attributions will occur only for the positive review such that, when the consumer review is positive, consumers exposed to the reviewer's angry-looking avatar (vs the reviewer's happy-looking avatar) will be more likely to attribute the review to product performance.

H4. The effect of the avatar's facial expression on the strength of intention to purchase the brand will occur only for the positive review such that, when the consumer review is positive, the reviewer's angry-looking avatar (vs the reviewer's happy-looking avatar) will have a greater impact on the intention to purchase the brand.

Further, previous research has found a mediating role of causal attributions on the effect of persuasive messages or tactics on persuasion (Freling and Dacin, 2010; Groza *et al.*, 2011; Laczniak *et al.*, 2001; Sen and Lerman, 2007). For example, Sen and Lerman (2007) found that causal attributions about the reviewer mediated the interaction effect of product type (utilitarian vs hedonic) and review valence on the attitude toward the consumer review. Based on the previous studies, we expect that the causal attributions will mediate the interaction effect of the facial expression of the reviewer's avatar and the review valence on purchase decisions. Specifically, we expect that a positive review along with an angry-looking avatar (i.e. disconfirmed expectancy) will be less (more) likely to be attributed to the reviewer's dispositional characteristic (the product's performance) than the positive review presenting with a happy-looking avatar (i.e. confirmed expectancy). The attribution toward the reviewer's dispositional characteristic (the attribution toward product performance), in turn, will influence consumer purchase decisions negatively (positively). However, the mediating roles of attributions will not occur when the consumer review is negative. Thus:

H5. Causal attributions will mediate the effect of the facial expression of the reviewer's avatar on purchase decisions only when the consumer review is positive such that, when the review is positive, consumers exposed to the reviewer's angry-looking avatar (vs the reviewer's happy-looking avatar) will be less likely to attribute the review toward the reviewer's dispositional characteristic. The attribution toward the reviewer's dispositional characteristic, in turn, will influence the strength of intention to purchase the brand negatively.

H6. Causal attributions will mediate the effect of the facial expression of the reviewer's avatar on purchase decisions only when the consumer review is positive such that, when the review is positive, consumers exposed to the reviewer's angry-looking avatar (vs the reviewer's happy-looking avatar) will be more likely to attribute the review to product performance. The attribution toward product performance, in turn, will influence the strength of intention to purchase the brand positively.

Method
To test the proposed hypotheses, a 2 (facial expression of the reviewer's avatar: happy vs angry) × 2 (valence of the consumer review: positive vs negative) between-subjects experimental design was used.

Participants
Overall, 166 college students were recruited from advertising, public relations, retailing, and telecommunication courses at a large Midwestern university in the USA and given extra course credit for their participation. Of that group, 21 students failed to complete the survey and thus were excluded from subsequent data analyses. The average age of

the participants was 21 (SD = 1.75), with the ages ranging from 19 to 31. There were more females (67 percent) than males. College students were considered appropriate for this study because the majority of college students surveyed indicated that word-of-mouth (WOM) was the most influential product information when making a purchase decision (WOMMA, 2005); and seeking WOM was the most preferred way to learn about new products or services (Youth Trends, 2007).

Stimuli development
Product selection. A pretest with 30 undergraduate students (different from the main study's participants) was conducted to select a stimulus product for this study. Participants showed high levels of interest in travel ($M = 6.7$, SD = 0.60 on a seven-point scale) and moderate levels of interest in using a packaged tour ($M = 4.5$, SD = 1.63). Thus, a packaged Europe tour was selected as the stimulus product for this study. A foreign brand name was used to represent the packaged tour agency in this study to avoid possible confounding effects of prior brand attitudes on participants' responses.

Valence of the consumer review. To develop two different versions of the consumer review (e.g. positive vs negative), four of the most frequently discussed attributes in existing consumer reviews regarding packaged tours were identified: itinerary, tour guide, transportation, and lodging. These four attributes were then incorporated into the stimuli consumer reviews. The two versions of the consumer review were almost identical except in their evaluative adjectives (see Appendix 1). In order to manipulate the positive review and the negative review, evaluative adjectives with opposite meanings were selected (e.g. "wonderful/awful," etc.).

Facial expression of reviewer's avatar. Female avatars in static form were created, using free avatar creation tools available on the Yahoo! Avatars web site. Researchers have suggested that a smiling or up-turned mouth tends to signal happiness (Keating *et al.*, 1981) and lowered midline eyebrows tend to communicate anger (Ekman, 1979). Based on these studies, two different versions of the avatar's facial expression were developed. In one version, the avatar had a happy facial expression with an up-turned mouth, while in the other version, the avatar had an angry expression with lowered midline eyebrows and a down-turned mouth (see Appendix 2).

Consumer review web site. Four different versions of the hypothetical consumer review web site were developed. All versions included menus for various product categories, a question posted by a person with a male avatar seeking consumer opinions about the packaged Europe tour brand, and an answer posted by a person with a female avatar providing a consumer review about the brand. All versions were identical except for two factors. First, in half of the versions, the review was positive, and in the other half, the review was negative. Second, half of the versions presented the reviewer's avatar as looking happy, while the other half presented the reviewer's avatar looking angry.

Procedure
The experiment was conducted online. Participants were given a URL to the experiment web site via an e-mail and asked to visit the site. On the experiment web site, the participants were asked to imagine that they were searching for a packaged Europe tour. The Java Script of the webpage randomly assigned each participant to one of four experimental conditions. After reading the consumer review about the packaged Europe tour, the participants were asked to answer questions regarding the consumer review and the reviewed brand.

Measures
Inference for reviewer's agreeableness. Inferences about the reviewer's agreeableness were measured by asking participants to indicate how they perceived the reviewer's agreeableness, with nine items (e.g. "someone who tends to find fault with others") on a seven-point scale ($\alpha = 0.85$) (John and Srivastava, 1999).

Causal attributions. Causal attribution toward the reviewer's dispositional characteristic was measured by asking participants to indicate their agreement to each of three statements on a seven-point scale: the reviewer wrote the review in this manner "because the reviewer is the type of person who always says positive (or negative) things about a person or a company," "because the reviewer does not tend (or tends) to find fault with others or companies," and "because the reviewer is always positive (or negative)" ($\alpha = 0.85$). These items were borrowed from previous studies (John and Srivastava, 1999; Laczniak *et al.*, 2001) and modified for this study.

Similarly, causal attribution toward product performance was measured with three statements: the reviewer wrote the review in this manner "because this travel agency's tour package is an excellent (vs a terrible) package," "because this travel agency's tour package is an outstanding (or an awful) package," and "because this travel agency's tour package provides the good (or bad) features that most people (or do not) want to have" ($\alpha = 0.84$). These items were borrowed from previous studies (Laczniak *et al.*, 2001; Lee and Youn, 2009) and modified for this study.

Strength of intention to purchase the brand. Following Mizerski's (1982) analysis for measuring attitude strength, intention to purchase the brand was first measured using three items (e.g. "unlikely/likely") on a seven-point scale ($\alpha = 0.98$) (Bearden *et al.*, 1984). Next, the scale was converted to scores ranging from -3 to 3. Each score was then transformed to produce a value ranging from 0 (the weakest intention) to 3 (the strongest intention).

Perceived avatar attractiveness. It is well known that attractive communicators are more persuasive than are unattractive ones (Joseph, 1982). To control for the influence of the perceived attractiveness of the reviewer's avatar, perceived avatar attractiveness was measured using five items (e.g. "unattractive-attractive") on a seven-point scale ($\alpha = 0.87$) (Ohanian, 1990).

Need for cognition. Participants with a high need for cognition (hereafter NFC) may elaborate more on why the reviewer wrote the consumer review in a specific manner than will those with a low NFC. To control for this influence, the participants' NFC was measured using 18 items on a seven-point scale ($\alpha = 0.80$) (Cacioppo *et al.*, 1984).

Frequency of reading consumer reviews. Prior experience with consumer reviews may influence how consumers process the consumer review in this study. To control for this influence, the frequency of reading consumer reviews was measured with five responses including, "never," "less than twice a month," "more than twice a month – less than once a week," "more than once a week – less than three times a week," and "more than three times a week."

The scores for each of the multi-item scales were averaged for subsequent analyses.

Results
Manipulation checks
Valence of the consumer review. To test the manipulation of the valence of the consumer review, participants were asked to respond to the question, "How positive or negative was the presented consumer review?" on an 11-point scale (-5 being "very negative" and

+ 5 being "very positive"). An analysis of variance (ANOVA) revealed the significant main effect of the review valence ($F(1, 141) = 1{,}290.95$, $p < 0.001$). Participants exposed to the positive review ($M = 3.97$, $SD = 1.20$) perceived that the review was more favorable than did those reading the negative review ($M = -3.78$, $SD = 1.38$). Additionally, the mean scores of perceived valence for both the positive and the negative review were almost equidistant from the scale midpoint. Thus, the manipulation of the review valence was successful.

Facial expression of the reviewer's avatar. The manipulation of the facial expression of the reviewer's avatar was tested by asking the participants to indicate their agreement to each of the two statements: "The reviewer's avatar looks happy" and "The reviewer's avatar looks angry," on a seven-point scale, with 1 being "extremely inaccurate" and 7 being "extremely accurate." ANOVAs revealed significant main effects of the facial expression on perceived happiness ($F(1, 141) = 1{,}638.66$, $p < 0.001$), and on perceived anger ($F(1, 141) = 1{,}247.89$, $p < 0.001$). Participants exposed to the happy-looking avatar ($M = 6.01$, $SD = 0.88$) were more likely to perceive that the avatar looked happy than were those exposed to the angry-looking avatar ($M = 1.24$, $SD = 0.52$). Additionally, participants exposed to the angry-looking avatar ($M = 6.51$, $SD = 0.85$) were more likely to perceive that the avatar looked angry than those exposed to the happy-looking avatar ($M = 1.62$, $SD = 0.82$). Thus, the manipulation of the facial expression on the reviewer's avatar was successful.

Hypotheses testing
Inference for reviewer's dispositional agreeableness. H1 predicted that consumers tend to make trait inferences about a reviewer based on the facial expression on the reviewer's avatar. An analysis of covariance (ANCOVA) with perceived attractiveness of the avatar as a covariate was conducted. Perceived avatar attractiveness ($F(1, 140) = 19.61$, $p < 0.001$) was a significant covariate, indicating that the more participants perceived the reviewer's avatar to be attractive, the more they perceived the reviewer as higher in agreeableness. As expected, the ANCOVA revealed a significant main effect of an avatar facial expression on agreeableness ($F(1, 140) = 4.71$, $p = 0.03$). Specifically, participants exposed to the reviewer whose avatar had the happy facial expression ($M = 4.44$, $SD = 0.80$) were more likely to perceive the reviewer as higher in agreeableness than did those exposed to the reviewer whose avatar had an angry facial expression ($M = 4.16$, $SD = 0.77$). Thus, *H1* was supported.

Interaction effect of avatar facial expression and review valence. H2 and H3 predicted interaction effects of the facial expression of the reviewer's avatar and the valence of the consumer review on causal attribution toward the reviewer's characteristic (*H2*) and causal attribution toward product performance (*H3*), respectively.

Not supporting the prediction in *H2*, an ANCOVA with avatar attractiveness, NFC, and frequency of reading consumer reviews as covariates revealed that the two-way interaction between the facial expression of the reviewer's avatar and the valence of the consumer review on causal attribution toward the reviewer's characteristic was not significant ($F(1, 136) = 2.41$, $p = 0.12$).

As expected, an ANCOVA with avatar attractiveness, NFC, and frequency of reading consumer reviews as covariates revealed a significant two-way interaction on causal attribution toward the product performance ($F(1, 136) = 5.14$, $p = 0.03$). No covariate was significant. Specifically, as shown in Figure 1, the contrast test indicated that when the review was positive, participants exposed to the reviewer's angry-looking avatar ($M = 5.43$, $SD = 0.90$) were more likely to attribute that positive review

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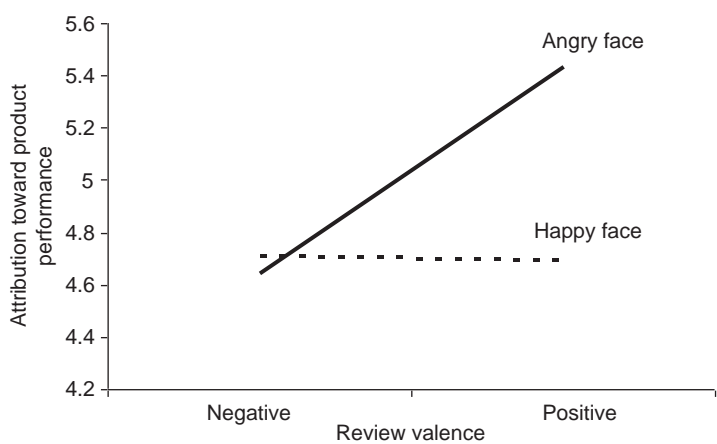
to the product's performance than did those exposed to the reviewer's happy-looking avatar ($M = 4.69$, SD $= 1.18$) ($F(1, 136) = 6.32$, $p = 0.01$). When the review was negative, however, the happy-looking avatar ($M = 4.71$, SD $= 0.99$) and the angry-looking avatar ($M = 4.64$, SD $= 1.03$) were similar in terms of causal attributions toward product performance ($F(1, 136) = 0.06$, $p = 0.80$). Thus, *H3* was supported.

H4 predicted an interaction effect of the avatar facial expression and the valence of the consumer review on strength of intention to purchase the brand. An ANCOVA was carried out with avatar attractiveness, NFC, and frequency of reading consumer reviews as covariates. Both avatar attractiveness ($F(1, 136) = 7.75$, $p = 0.01$) and frequency of reading consumer reviews ($F(1, 136) = 8.04$, $p = 0.01$) were significant covariates. Specifically, the more the reviewer's avatar was perceived to be attractive and the more frequently participants read consumer reviews, the greater the strength of intention to purchase the reviewed brand was.

As expected, the ANCOVA indicated that the two-way interaction was marginally significant ($F(1, 136) = 3.43$, $p = 0.07$). As shown in Figure 2, the contrast test indicated that when the consumer review was positive, the reviewer's angry-looking avatar
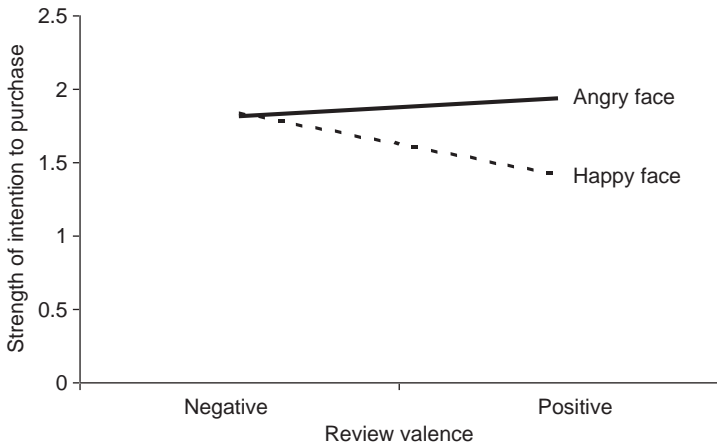
($M = 1.93$, SD $= 0.84$) had a greater effect on strength of intention to purchase the brand than did the happy-looking avatar ($M = 1.41$, SD $= 0.72$) ($F(1, 136) = 4.70$, $p = 0.03$). When the consumer review was negative, however, the happy-looking avatar ($M = 1.83$, SD $= 1.75$) and the angry-looking avatar ($M = 1.81$) were similar in terms of intention to purchase ($F(1, 136) = 0.01$, $p = 0.94$). Thus, *H4* was supported.

Mediating role of causal attributions. *H5* and *H6* predicted that causal attribution toward the reviewer's characteristic (*H5*) and causal attribution toward product performance (*H6*) would mediate the effect of the avatar facial expression on the strength of intention to purchase the brand only when the review is positive, respectively. These hypotheses involve a conditional indirect effect, which is defined as "the magnitude of an indirect effect at a particular value of a moderator" (Preacher *et al.*, 2007, p. 186). Thus, conditional indirect effect analyses were conducted using the MODMED SPSS macro (version 2.0; model 2) developed by Preacher *et al.* (2007).

The conditional indirect effect analysis with causal attribution toward product performance as a potential mediator indicated a significant interaction effect of the facial expression of the reviewer's avatar and the review valence on causal attribution toward product performance ($B = -0.82$, SE $= 0.36$, $t = -2.27$, $p = 0.03$). Additionally, causal attribution toward product performance influenced the strength of intention to purchase the brand positively ($B = 0.38$, SE $= 0.06$, $t = 6.32$, $p < 0.001$). Finally, the indirect effect of the facial expression of the reviewer's avatar on the strength of intention to purchase the brand through causal attribution toward product performance was significant when the consumer review was positive (the indirect effect $= -0.29$, SE $= 0.12$, $Z = -2.31$, $p = 0.02$, 95 percent bias-corrected and accelerated (BCa) confidence intervals (CIs) $= -0.5427$, -0.0617). When the consumer review was negative, however, the indirect effect was not significant (the indirect effect $= 0.03$, SE $= 0.10$, $Z = 0.25$, $p = 0.80$, 95 percent BCa CI $= -0.1752$, 0.1867). Thus, *H6* was supported (Figure 3).

However, the conditional indirect effect analysis with attribution toward the reviewer's characteristic as a potential mediator revealed that attribution toward the reviewer's characteristic did not mediate the interaction effect of the avatar facial
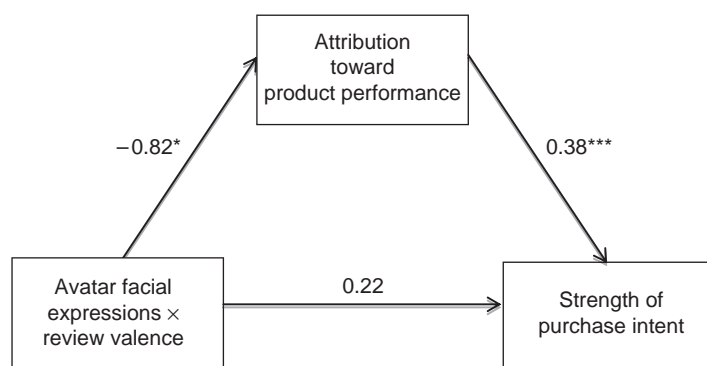
Notes: Indirect effect of the avatar facial expressions on strength of purchase intent through attribution toward product performance: for positive review (–0.29*), for negative review (–0.03); ***$p < 0.001$, *$p < 0.05$

Figure 3.
Conditional indirect effects

expression and the review valence on the strength of intention to purchase the brand. Thus, *H5* was not supported.

Discussion and conclusions
This study sought to explore how facial expressions of the reviewer's avatar and the valence of the consumer review interacted to influence consumer purchase decisions. The findings of this study demonstrate that the avatar facial expressions of the reviewer play a significant role in consumer processing of consumer reviews.

Specifically, this study found that participants inferred a reviewer's dispositional traits based on her avatar's facial expression to the extent that the reviewer with the happy-looking avatar was perceived as being higher in agreeableness than the reviewer with the angry-looking avatar. This finding is consistent with findings that people do form an initial impression of others based on their avatars' characteristics (Nowak, 2004; Talamo and Ligorio, 2001) and people do infer others' traits based on their facial expressions depicting emotion (Arya *et al.*, 2006; Montepare and Dobish, 2003).

Further, our findings demonstrated that, when the consumer review was positive, participants exposed to the reviewer's angry-looking avatar were more likely to attribute the positive review to the product's performance than did those exposed to the happy-looking avatar. The attribution toward product performance, in turn, influenced the strength of intention to purchase the brand positively. Consistent with attributional analyses in terms of expectancies (Eagly and Chaiken, 1975; Eagly *et al.*, 1978), this finding may have occurred because when participants were exposed to the positive review with the reviewer's happy-looking avatar, they might have perceived that the positive review was expected on the basis of the reviewer higher in agreeableness. Due to the confirmed expectancy, the positive review was less likely to be attributed to the product's performance, thus leading to a smaller impact on purchase decisions. When participants were exposed to the positive review with the angry-looking avatar, however, they may have perceived that the positive review was unexpected on the basis of the reviewer lower in agreeableness. Due to that disconfirmed expectancy, the positive review was then more likely to be attributed to the product's performance and in turn led to a greater impact on purchase decisions. When the consumer review was negative, however, the reviewer's facial expression did not appear to influence causal attributions toward product performance and the strength of intention to purchase the brand differently.

Unexpectedly, the proposed interaction effect of the facial expression of the reviewer's avatar and the review valence on causal attribution toward the reviewer's characteristic was not significant. It appears that, although participants inferred a reviewer's dispositional traits based on her avatar's facial expression, they tended not to attribute the consumer review toward the reviewer's characteristic very strongly (e.g. $Ms < 3.68$ for all conditions). This, in turn, might have led to a lack of statistical significance.

Previous research has demonstrated impacts of a consumer review on product evaluation and choice depending on the valence of the consumer review (Chevalier and Mayzlin, 2006; Sen and Lerman, 2007); the information quality of the consumer review (Cheung *et al.*, 2008; Park *et al.*, 2007); the type of the consumer review (e.g. attribute- vs benefit-centric) (Park and Kim, 2008); the platform where the consumer review appears (Lee and Youn, 2009); and receiver characteristics, such as preexisting brand image (Chiou and Cheng, 2003), similarity between the receiver's interest and the online forum members' interests (Prendergast *et al.*, 2010), and trust in online shopping malls (Lee *et al.*, 2011). Due to the anonymous nature of consumer reviews, source characteristics have been virtually

ignored in research on consumer reviews. This study contributes to the literature on consumer reviews by identifying an important source characteristic that consumers consider when processing consumer reviews – the avatar of the reviewer.

This study also extends the literature on avatars. Researchers in marketing have examined the effectiveness of various aspects of avatars, including attractive- vs expert-looking avatar salespersons (Holzwarth *et al.*, 2006); avatar salespersons with sincere/competent vs exciting personalities (Jin and Sung, 2010); avatar salespersons with task-oriented vs social-oriented interaction styles (Keeling *et al.*, 2010); and similarity between an avatar salesperson and an online buyer (Pentina and Taylor, 2010). This study emphasizes the importance of emotional facial expression of the reviewer's avatar on consumer processing of consumer reviews.

This study also contributes to the literature on emotional facial expressions and trait inferences. Previous studies in this area used photographs of target individuals to test the effect of a target person's emotional facial expression on trait inferences about that person (Hess *et al.*, 2000; Montepare and Dobish, 2003). This study provides empirical evidence that this effect occurs even when interacting with avatars.

Finally, this study contributes to the literature on attribution theory. Our findings demonstrate that the discounting and augmentation principles (Kelley, 1973) and the attributional analyses in terms of expectancies (Eagly and Chaiken, 1975; Eagly *et al.*, 1978) are robust theoretical frameworks that can also help researchers explain the phenomena of consumer reviews and avatars in the digital worlds.

The current study also has managerial implications. It has been reported that a growing number of marketers compensate consumers to write positive reviews about their products and post them on the internet (Blackshaw, 2006). The findings of this study suggest that marketers should advise their consumer agents to create or choose avatars in such a way that other consumers perceive the contents of the agents' consumer reviews to be unexpected on the basis of their avatars. Further, marketers should keep in mind that consumers try to infer why reviewers review products in a certain manner and make purchase decisions based on their causal inferences, and develop strategies that would make consumers attribute the agents' consumer reviews toward product performance. Finally, given that people can represent their ideal identity or try out different identities on the internet by creating an avatar (Vasalou and Joinson, 2009), the significant covariate effect of perceived avatar attractiveness on strength of purchase intention suggests that marketers should recommend their agents to create an attractive avatar to make their reviews more persuasive.

Limitations and future research
Although the findings of this study have important implications, limitations do exist. To create a situation where the facial expression of the avatar and the content of the consumer review do seem to match or they do not seem to match, this study focussed on two emotional expressions of the reviewer's avatar, anger and happiness, and the valence of the review. Although these two facial expressions, along with the positive and negative reviews, were deemed best in examining causal inferences in terms of expectancies, however, future research should examine interactions between other types of avatar facial expressions (e.g. surprise) and other characteristics of consumer reviews (e.g. review extremity) as well to more fully explore how the facial expression of the reviewer's avatar influences consumer processing of consumer reviews.

This study used a convenience sample of undergraduate students at a large Midwestern university in the USA. Students are not representative of all consumers

who read consumer reviews. Although the use of "a sample homogeneous on non-theoretical variables," such as students in our study, is preferred for theory testing (Calder *et al.*, 1981, p. 200), future studies should determine whether our findings can be replicated in other populations.

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Appendix 1

1. Positive consumer review

This past summer, my friend and I traveled Europe with the BRAND travel agency's Europe tour package. Our trip was wonderful.

Overall, the tour was very well organized and efficient. BRAND did a good job identifying the "must sees" for us. We would never have been able to see as much as we did if we were on our own. BRAND was true to the information provided in its brochure.

The tour guide was very good. I heard that BRAND travel agency's guides are required to have atleast three years of experience before BRAND will hire them. Our guide knew a lot about the history and culture of each of the locations. Also, the guide's friendly personality made the trip very pleasant.

During our trip, we traveled in motor coaches. The buses were spacious and very comfortable, and there was enough room for my legs. The overall quality of the hotels in all of the locations was very good, too. Of course, some were better than others, but none were less than three star-quality. Also, the hotels were centrally located so it was convenient to get around cities.

I would use this travel agency again next time.

2. Negative consumer review

This past summer, my friend and I traveled Europe with the BRAND travel agency's Europe tour package. Our trip was awful.

Overall, the tour was very unorganized and inefficient. BRAND did a poor job identifying the "must sees" for us. We would have been able to see more than we did if we were on our own. BRAND was not true to the information provided in its brochure.

The tour guide was very bad. I heard that BRAND travel agency's guides are not required to have previous experience before BRAND will hire them. Our guide knew little about the history or culture of any of the locations. Also, the guide's unfriendly personality made the trip very unpleasant.

During our trip, we traveled in motor coaches. The buses were tiny and very uncomfortable, and there was not enough room for my legs. The overall quality of the hotels in most locations was very poor, too. Of course, some were better than others, but none were more than three star-quality. Also, the hotels were located on the edges of cities so it was inconvenient to get around cities.

I would not use this travel agency again next time.

Appendix 2

Avatar looking happy

Avatar looking angry

Figure A1.
Avatar facial expressions

About the authors

Mira Lee (PhD, University of Minnesota-Twin Cities) is an Associate Professor of Marketing in the School of Business Administration at Chung-Ang University. Her research focuses on consumer responses to consumer-generated content on the internet and the use of entertainment games for advertising and marketing purposes. Her articles have appeared in *Journal of Advertising*, *Journal of Consumer Affairs*, *International Journal of Advertising*, *Journal of Communication*, *Cyberpsychology, Behavior and Social Networking*, *Journal of Current Issues and Research in Advertising*, *Journalism and Mass Communication Quarterly* among others. Mira Lee is the corresponding author and can be contacted at: miralee@cau.ac.kr

Mikyoung Kim (PhD, Michigan State University) is a Senior Research Manager in the Cheil Communication Sciences Institute at Cheil Worldwide, Seoul, Korea. Her primary research interests focus on effects of consumer-generated contents on brands and marketing communications in social media. Her research has appeared in *Journal of Consumer Affairs*, *International Journal of Advertising*, *Journal of Current Issues and Research in Advertising*, *CyberPsychology Behavior and Social Networking*, *Asian Journal of Communication*, and *Journal of Social Behavior and Personality* among others.

Wei Peng (PhD, University of Southern California) is an Assistant Professor in the Department of Telecommunication, Information Studies, and Media, Michigan State University. Her primary research interest is to understand how to better use interactive technologies to influence human behaviors. Her recent projects focus on using digital games for health promotion, health education, and social change. She is also studying social influence in the domain of user-generated content. Her recent publications appear in *Journal of Communication*, *Health Communication*, *Journal of Health Communication*, *Telemedicine and e-Health*, *Computers in Human Behavior*, *CyberPsychology, Behavior, and Social Networking*, and *New Media & Society*.