**Are Third-Party Green-Brown Ratings Believed?:
The Role of Prior Brand Loyalty and Environmental Concern**

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Abstract

This study shows the role of consumers' prior brand loyalty and environmental concern in their responses to third-party green-brown ratings of a brand. The online quasi-experiment with a national sample of U.S. consumers revealed that the validity of third-party green-brown ratings is believed equally between consumers with high and low environmental concern, but the impact of the ratings on brand greenness perception was greater among consumers with high (vs. low) environmental concern. This study also shows that consumers who are loyal to a brand are more likely to accept the validity of the brand's green rating than that of its brown rating. Further, loyal consumers deny the relevance of the brown rating to the brand's greenness. These findings suggest biased assimilation of third-party green-brown rating information as a function of the consumer's prior brand loyalty and environmental concern. We discuss the theoretical and managerial implications of the findings.

Key Words: third-party ratings, validity, greenness, brand loyalty, environmental concern

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1. Introduction

Environmental concern and sustainability have gained increasing attention recently. Government and non-profit organizations (NPOs) work to educate consumers to elevate their concern for the environment and exert pressure on companies to accept greater responsibility for the environmental impact of their products (First & Khatriwal, 2010). This trend has led to companies' *environmental marketing* or *green marketing* and raised the profile of so-called green or eco-friendly products in the market (Ko, Hwang, & Kim, 2013). *Green* products minimize the use of natural resources and toxic materials as well as the emissions of waste and pollutants in their use and disposal, whereas *brown* products may have a negative impact on the environment. Launches and sales of products with a green claim have been steadily increasing during the last decade (Unruh & Ettenson, 2010; USDA, 2013).

Companies often use third-party green ratings and eco-seals from independent organizations (e.g., product testing laboratories, environmental standards organizations, government agencies, and non-profit advocacy organizations) as a means of verifying and communicating the greenness of their products or brands (Ottman, Stafford, & Hartman, 2006). Third-party endorsements tend to be considered more objective and lacking conflicts of interest, which should enhance source credibility and therefore believability of the company's green claims. However, with the increase of green marketing, organizations that offer eco-seals or green rating information have proliferated. Such organizations range from ones that award eco-seals or determine green ratings after conducting an assessment of the environmental impacts of a candidate brand or product based on an established set of criteria to ones that provide so-called

“green certification services” to companies without requiring any verification of the product or brand’s green claim (Bounds, 2009). According to ecolabelindex.com, there are more than 450 eco-labels globally in 197 countries and 25 industry sectors (Ecolabel Index, 2014). The proliferation of the number and kinds of eco-seals or green ratings has led to confusion and skepticism among consumers about their meanings. Further, some companies are accused of greenwashing, or the practice of green marketing using “vague, unsubstantiated and potentially misleading environmental claims” (Fernando, Suganthi, & Sivakumaran, 2014, p. 167), thereby undermining the credibility of green marketing claims. One survey revealed that more than half of consumers thought that green claims were fake and used only to make consumers pay higher prices (Yates, 2009). Hence, the effectiveness of third-party green-brown rating information may depend on consumers’ belief of the validity of such information.

Consumers’ personal characteristics also may affect their responses to third-party green-brown rating information. For example, consumers highly motivated to consume green products may exert more effort to determine which green ratings are credible and which are not. Further, consumers’ commitment to the brand may interfere with their accurate interpretation of the meaning of the brand’s green or brown rating. These individual factors need to be taken into account as firms determine the amount of effort to exert in utilizing (or not) third-party green ratings in their promotions or how to respond to a brown rating to minimize its negative impact on their brands. Therefore, the purpose of this study is to examine two key consumer characteristics, environmental concern and prior brand loyalty, and their relationship to consumer perceptions of the validity of third-party green-brown rating information and the brand’s greenness, when the information is communicated by a seemingly objective news source.

2. Theoretical Framework and Hypotheses

2.1. Biased Assimilation

The well-established theories of cognitive dissonance (Festinger, 1957) and cognitive consistency (Abelson et al., 1968) suggest that when people are exposed to new information inconsistent with their existing beliefs, a state of *cognitive dissonance* is created. Cognitive dissonance causes psychological discomfort, and thus individuals may engage in a variety of cognitive mechanisms to resist changing existing attitudes and to maintain cognitive consistency (Fishbein & Ajzen, 1981; Festinger, 1957). One mechanism used to regain cognitive consistency is *biased assimilation*, which refers to denying the validity of new information that is inconsistent with existing beliefs (e.g., Ahluwalia, 2000; Ditto, Scepansky, Munro, Apanovitch, & Lockhart, 1998; Lord, Ross, & Lepper, 1979). The validity of cognitively dissonant information can be discredited in many ways such as by questioning the trustworthiness of the information, by critically scrutinizing and reevaluating the information, or by looking for more consonant information from memory or the environment that can help adjust the meaning of the dissonant information (Ahluwalia, 2000; Ditto et al., 1998; Kunda, 1990). Through biased assimilation, people erroneously interpret dissonant information in a biased direction toward their existing cognitions so that the information is never established in their cognitions in a dissonant manner in the first place (Ahluwalia, 2000; Kunda, 1990).

Companies use green marketing claims to establish a green position of their product or brand in consumers' minds. However, not all consumers have the expertise to verify green claims. For example, one survey revealed that more than 60% of consumers admitted that they were not able to distinguish which products were better for the environment (Yates, 2009). This lack of consumer expertise, coupled with the varied and complex nature of green claims, often generates skepticism towards green claims (Unrush & Ettenson 2010). In an attempt to overcome

consumers' skepticism toward green marketing claims, companies frequently use third-party green ratings or eco-seals from independent organizations (Ottman et al., 2006). However, the overabundance of green ratings and their lack of clearly identifiable differences make it difficult for consumers to assess their credibility. From the perspective of biased assimilation, consumers' differential reactions to a brand's third-party green-brown rating information may be accounted for by their (1) biased perceptions of the validity of the green-brown rating (i.e., how believable consumers perceive the green or brown rating to be) and (2) biased encoding of the green-brown rating (i.e., how green or brown the rating is interpreted as being).

The literature shows that individuals' motivation to diminish dissonance and maintain consistency in their cognitions about an object or issue at hand is affected by their involvement with or commitment to the object or issue (Ahluwalia, 2000; Festinger, 1957; O'Keefe, 2002). The more involved with or committed to the object or issue, the greater the psychological discomfort caused by dissonance between prior beliefs and new pieces of information and therefore the more likely the person is to engage in consistency maintenance. We propose that two personal involvement factors affect consumers' responses to a brand's third-party green-brown rating information. One is the consumer's level of involvement with environmental issues, which is referred to as *environmental concern*, and the other is the level of commitment to the brand, operationalized in this study as *prior brand loyalty*. Subsequent sections discuss the literature and hypotheses (see Fig. 1), explaining how environmental concern and prior brand loyalty may affect consumers' responses to a brand's third-party green-brown rating information in light of the biased assimilation mechanism of cognitive consistency maintenance.

Insert Fig. 1 about here.

2.2. Environmental Concern

Environmental concern increasingly plays an important role in consumers' product and brand choice. Greater environmental concern leads consumers to develop greater knowledge of environmental topics (Arbuthnot & Lingg, 1975; Ellen, 1994) and greater interest in information about environmentally friendly products (Minton & Rose, 1997). Due to superior knowledge and interest, consumers who are more concerned about the environment are more likely to be familiar with various green ratings and make finer distinctions between them. Thus, consumers with high environmental concern may be more likely to recognize and value third-party green ratings based on rigorous standards, as compared with consumers with low environmental concern who are likely to have less knowledge of different standards among green ratings and thus may be more confused and suspicious about green ratings as a whole. Corroborating this idea, Kangun, Carlson, and Grove (1991) reported that consumers with less environmental knowledge were more likely to consider green advertising claims to be misleading and deceptive. Chang (2011) also argues that when consumers have conflicting attitudes toward environmental issues, high-effort green ad claims can be perceived as exaggerated so that the believability of the claims may be discounted. Thus, we propose that consumers' existing level of environmental concern biases their tendency to believe the validity of third-party green-brown ratings established on rigorous standards, thereby altering the effect of the rating information on their perceptions of greenness of the brand. When a third-party green-brown rating system is built on objective and valid criteria, consumers with high environmental concern are more likely to recognize the reputation of such a rating system, whereas consumers with low environmental concern are likely to have less motivation or ability to recognize the reputation of the rating system and thus view the rating information with greater suspicion. Therefore, the following

hypotheses are proposed:

Hypothesis 1: Consumers with high (vs. low) environmental concern perceive a brand's green-brown rating information from a credible third-party source (hereafter, "third-party green-brown rating information") to be more valid.

Hypothesis 2: Third-party green-brown rating information has a greater effect on a brand greenness perception among consumers with high (vs. low) environmental concern.

2.3. Prior Brand Loyalty

Brand loyalty has typically been defined in behavioral and attitudinal dimensions (Kandampully & Suhartanto, 2003; Reinartz & Kumar, 2002). The behavioral dimension of brand loyalty addresses consumers' actual behavior of purchasing or repurchasing products from a brand over other alternatives and distributing positive word-of-mouth about the brand (Dawes, 2014; Romaniuk & Nenycz-Thiel, 2013). The attitudinal dimension of brand loyalty addresses the positive attributes consumers associate with the brand and the psychological commitment that develops through cumulative satisfying experiences with the brand (Chang, Lv, Chou, He, & Song, 2014; Dick & Basu, 1994). In sum, consumers who are loyal to a brand have a favorable attitude toward the brand and behave toward the brand in a manner consistent with their favorable attitude. Therefore, we propose that consumers will show biased assimilation of third-party green-brown rating information for brands to which they are loyal, but not for brands to which they are not loyal. In other words, loyal consumers are likely to believe the validity of third-party rating information when it shows that the brand is green, but be skeptical about its validity when it indicates that the brand is brown. This proposition is consistent with research showing that consumers with high commitment to a brand are more likely to contradict negative brand information (Ahluwalia, Burnkrant, & Unnava, 2000), and those with strong, positive

brand image make a more lenient interpretation about the brand's product-harm crisis and the company's response to it (Dawar & Pillutla, 2000). Therefore, we expect the following:

Hypothesis 3: Loyal consumers perceive a higher validity of the brand's green rating than its brown rating, whereas non-loyal consumers perceive the brand's green and brown ratings to be equally valid.

Corroborating the human tendency of striving to achieve cognitive consistency through biased assimilation, the literature has demonstrated a plethora of evidence for the *halo effect* of favorable brands that interferes with consumers' accurate interpretations of individual product attribute information (e.g., Leuthesser, Kohli, & Harich, 1995). Halo effects of brands are manifested in diverse advertising contexts in that advertising effectiveness tends to be higher for brands with more favorable attitudes (Machleit & Wilson, 1988). For example, humor in advertisements is responded to more favorably when the advertisements are for brands toward which consumers have positive prior attitudes (Chattopadhyay & Basu, 1990). Thus, we expect that consumers will interpret a rating in a more positively biased manner for brands toward which they are loyal, resulting in a greener brand perception for loyal brands than for non-loyal brands, as hypothesized below:

Hypothesis 4: Perceived greenness of a brand after exposure to its third-party green-brown rating is higher among consumers who are loyal (vs. non-loyal) to the brand.

Finally, biased assimilation due to brand loyalty is also expected to moderate the relationship between the perceived validity of the third-party green-brown ratings and the perceived brand greenness. When a brand receives a green rating, the perceived validity of this rating is expected to relate positively to the consumer's perception of the brand's greenness (i.e., the more valid the green rating is seen to be, the greener the consumer perceives the brand to be);

whereas this relationship should be reversed when the brand receives a brown rating (i.e., the more valid the brown rating is seen to be, the less green the consumer perceives the brand to be). We, however, propose that in the presence of a brown rating, a negative relationship between perceived validity and perceived brand greenness will not occur for brand loyal consumers. For loyal consumers, the brown rating is dissonant information that is inconsistent with their favorable image of the brand. Thus, they may look at the brown rating score through a lens colored by their loyalty and actually interpret the meaning of the brown rating in a greener way than it actually is. Further, loyal consumers may adjust the meaning of the brown rating in a positively biased manner by looking for more consonant information from their own memories that counters the impact of the dissonant information (Ahluwalia, 2000). In doing so, loyal consumers may devalue the relevance of the brown rating to the brand's overall greenness. The following hypothesis reflects this discussion:

Hypothesis 5: Perceived validity of a third-party green rating positively influences perceived brand greenness among both loyal and non-loyal consumers. However, perceived validity of a third-party brown rating negatively influences perceived brand greenness among non-loyal consumers but not among loyal consumers.

3. Methods

3.1. Experimental Design and Stimuli

This study employed an Internet-based quasi-experiment with a 2 (Environmental Concern: high vs. low) x 2 (Prior Brand Loyalty: loyal vs. non-loyal) x 2 (Third-Party Green-Brown Ratings: green vs. brown rating) between-subjects design. Environmental concern and prior brand loyalty were operationalized using a median split method based on participants' scores in the respective construct described in the Measures section below. On the other hand,

third-party green-brown ratings were manipulated by mock news articles created using existing brands' green-brown ratings selected from a variety of sources considered to use relatively thorough assessment processes to issue their ratings. Four stimuli were created for each of the green and brown rating conditions. Each stimulus presented the green or brown rating of a given brand along with a description of the third-party rating organization (e.g., "Patagonia brand scored 4 leaves according to the Greenopia four-leaf rating system") and the criteria used by the rating organization to calculate the score (e.g., "In order to determine leaf scores..., Greenopia used six criteria including ... ") as well as further explanations that allude to the meaning of the rating (e.g., "Patagonia met Greenopia's standards in all criteria"). Table 1 lists the brands and their green-brown rating information used in the mock news article stimuli (see also the footnotes of Table 1 for full content of the Patagonia example).

Insert Table 1 about here.

To ensure unbiased brand selections in terms of existing brand greenness perceptions, a pretest was conducted with a convenience sample of 212 students from a Southeastern university who were asked to generate a list of brands they considered environmentally positive (i.e., green) and negative (i.e., brown). A total of 133 green brands and 110 brown brands were mentioned by at least one participant. Among the brands, we selected 21 most frequently mentioned as being either green or brown. We then examined third-party green-brown ratings of these brands from four sources including one government agency ("Design for the Environment" by United States Environmental Protection Agency), two non-profit organizations (Four-leaf rating system by Greenopia, Product Ratings by GoodGuide), and one media organization (Newsweek, 2009). Based on the availability of multiple ratings for each brand and the clear polarity of those ratings

(as green or brown), eight brands were selected. The brands were balanced such that four were perceived by the pretest sample and rated by the third-party sources as highly green and four as brown. Although prior green-brown brand image was not a variable of interest to this study, balanced inclusion of brands known to the public to be green and brown in each experimental condition was important to counter potential confounding effects of publicly known greenness of the brands featured in the stimuli. The eight brands also represented various product categories including apparel, beverages, retailers, and fast moving consumer goods.

3.2. Sample and Procedure

A U.S. national sample of 786 consumers (21-64 years old, mean age = 44.7 [SD = 10.8]; 301 men and 485 women) participated in the online experiment. A majority of the sample was non-Hispanic White (72.2%) and married (64.2%), and had at least some college or technical school education (84.4%). Participants represented diverse income levels with the median annual household income found in the \$60,000 to \$69,999 category. A majority (31.2%) described their occupation as professional or technical, followed by homemakers (14.5%), managers or administrators (11.5%), clerical workers (8.9%), and self-employed (8.1%). Respondents were dispersed across 49 states.

Participants were recruited via email sent from a marketing research firm to randomly selected members of its online consumer panel. The invitation email included a link to the online experiment information page, which contained a description of the study and a confidentiality and consent statement. After reading the study information, participants clicked on the link to the experiment website. On the experiment website, they first completed brand loyalty items. The questions about the specific brands of interest in this study were embedded in a longer questionnaire that asked respondents' opinions about a large group of brands. After responding

to these items and other filler items irrelevant to this study, respondents received a mock news article featuring the third-party green-brown rating information about one of the eight brands randomly assigned to them. After reading the news article, participants completed measures of perceived validity of the green-brown rating and perceived brand greenness. Finally, participants completed the environmental concern and demographic items and were thanked for their participation.

3.3. Measures

3.3.1. *Prior brand loyalty*

Prior brand loyalty was assessed using three items measuring attitudinal loyalty (brand attitude) and three items measuring behavioral loyalty toward the brand assigned to each participant. The attitudinal loyalty items were “[brand name] is pleasant,” “[brand name] is favorable,” “I like [brand name],” adapted from Kwon and Lennon (2009), and rated on a 5-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5). The behavioral loyalty items addressed how often participants purchased products from the assigned brand, how often they purchased from it even when its products were more expensive than similar products from other brands, and how often they recommended the brand to their friends and family; these were rated on a 5-point scale from *never* (1) to *very frequently* (5). Principal components analysis of the six loyalty items showed their unidimensionality in this study. Further, the loyalty items showed high reliability (Cronbach’s $\alpha = .91$). Thus, the six loyalty item scores were averaged into a single composite score, and a median split ($Md = 2.50$) was used to divide the sample into loyal and non-loyal groups.

3.3.2. *Environmental concern*

Environmental concern was measured using six Likert-scale items (1 = *strongly disagree*,

5 = *strongly agree*) adapted from the revised New Environmental Paradigm (NEP) scale (Steger, Pierce, Steel, & Lovrich, 1989). The original 12-item NEP scale was developed by Dunlap and Van Liere (1978, 1984) to tap into consumers' level of environmental concern. This scale has been used in many consumer sustainability studies in revised forms (e.g., Cordano, Welcomer, & Scherer, 2003; La Trobe & Acott, 2000). Adopting Steger et al.'s (1989) suggestion that a reduced set of six items was sufficient to capture the construct, this study employed three item worded pro-environmentally ("The balance of nature is very delicate and easily upset by human activities," "The earth is like a spaceship with only limited room and resources," and "Plants and animals do not exist primarily for human use") and three reverse-scored items ("Modifying the environment for human use seldom causes serious problems," "There are no limits to growth for nations like the U.S.," and "Humankind was created to rule over the rest of nature"). The six items were extracted into a single factor through principal components analysis and showed adequate reliability (Cronbach's $\alpha = .74$). Thus, scores of the first three items and reverse-coded scores of the latter three items were averaged into a composite score, with which a median split ($Md = 3.67$) was conducted to create high and low environmental concern groups.

3.3.3. Perceived validity and perceived brand greenness

A single question was used to measure each of the perceived validity of the third-party green-brown rating information ("How believable do you think the information about [brand name] presented above is?"; 1 = *not at all believable*, 5 = *completely believable*) and the perceived brand greenness ("Now that you have read the above information about [brand name], how green or brown would you rate [brand name]?"; 1 = *completely brown*, 7 = *completely green*).

4. Results

4.1. Manipulation Check

A series of t -tests confirmed that the loyal group showed significantly higher prior brand loyalty than the non-loyal group ($M_{\text{loyal}} = 3.52$, $SD_{\text{loyal}} = .64$; $M_{\text{non-loyal}} = 1.95$, $SD_{\text{non-loyal}} = .37$; $t_{784} = 42.996$, $p < .001$), and the high environmental concern group had a significantly higher environmental concern mean score than the low environmental concern group ($M_{\text{high EC}} = 4.31$, $SD_{\text{high EC}} = .37$; $M_{\text{low EC}} = 3.09$, $SD_{\text{low EC}} = .50$; $t_{784} = 38.754$, $p < .001$). Further, the brands depicted in the green rating condition stimuli were perceived to be significantly greener than those described in the brown rating condition stimuli ($M_{\text{green}} = 5.64$, $SD_{\text{green}} = 1.23$; $M_{\text{brown}} = 3.33$, $SD_{\text{brown}} = 1.64$; $t_{784} = 22.328$, $p < .001$).

4.2. Hypothesis Testing

4.2.1. Multivariate analysis of variance (MANOVA)

In order to test hypotheses 1 through 4, first, a $2 \times 2 \times 2$ between-subjects MANOVA was conducted for the two dependent variables (perceived validity and perceived brand greenness) with the three independent variables (third-party green-brown ratings, prior brand loyalty, environmental concern) as the fixed factors. MANOVA results revealed significant main effects of third-party green-brown ratings (Wilks' $\lambda = .56$, $F_{2,777} = 309.43$, $p < .001$, partial $\eta^2 = .44$), environmental concern (Wilks' $\lambda = .99$, $F_{2,777} = 3.09$, $p < .05$, partial $\eta^2 = .01$), and prior brand loyalty (Wilks' $\lambda = .90$, $F_{2,777} = 42.98$, $p < .001$, partial $\eta^2 = .10$) as well as significant two-way interaction effects of third-party green-brown ratings $\times$ prior brand loyalty (Wilks' $\lambda = .93$, $F_{2,777} = 28.92$, $p < .001$, partial $\eta^2 = .07$) and third-party green-brown ratings $\times$ environmental concern (Wilks' $\lambda = .98$, $F_{2,777} = 9.23$, $p < .001$, partial $\eta^2 = .02$), warranting further univariate analysis for each dependent variable. The two-way environmental concern $\times$ prior brand loyalty interaction (Wilks' $\lambda = .99$, $F_{2,777} = 1.03$, $p = .36$) and the three-way interaction (Wilks' $\lambda = 1.00$,

$F_{2,777} = 1.97, p = .14$) were not significant.

4.2.2. Univariate analysis of variance (ANOVA) for perceived validity (hypotheses 1 and 3)

Results from the follow-up univariate ANOVA for the perceived validity dependent variable (see Table 2) showed a non-significant main effect of environmental concern, rejecting hypothesis 1. Although the perceived validity mean was slightly higher among participants with high concern ($M = 3.31, SD = .90$) than low concern ($M = 3.26, SD = .98$) about the environment, consistent with the hypothesis, this mean difference was not statistically significant. None of the two-way and three-way interactions including environmental concern were significant, further evidence for rejecting hypothesis 1.

Insert Table 2 and Figure 2 about here.

The ANOVA results further showed significant main effects of third-party green-brown ratings and prior brand loyalty on perceived validity (see Table 2); participants tended to believe green ratings ($M = 3.33, SD = .95$) slightly more than brown ratings ($M = 3.24, SD = .94$), and brand loyal participants ($M = 3.46, SD = .90$) were more likely to believe the rating information than non-loyal participants ($M = 3.14, SD = .96$). However, these main effects are qualified by the significant ratings $\times$ prior loyalty interaction effect (see Table 2 and Fig. 2). Simple effect analyses within each of the loyal and non-loyal groups revealed that loyal consumers perceived the rating information to be significantly more valid when it indicated that the brand was green ($M = 3.68, SD = .88$) than brown ($M = 3.30, SD = .89; t_{361} = -3.97, p < .001$). However, non-loyal consumers showed no significant difference ($t_{421} = .62, p = .54$) in perceived validity between the green ($M = 3.12, SD = .93$) and brown ($M = 3.17, SD = .98$) ratings, statistically supporting hypothesis 3. However, given the low effect size of the interaction effect (partial η^2

< .02, Miles & Shevlin, 2001), caution is needed in interpreting the practical significance of the results.

4.2.3. Univariate ANOVA for perceived brand greenness (hypotheses 2 and 4)

Results from the ANOVA for the perceived brand greenness dependent variable (see Table 2) showed a significant main effect of third-party green-brown ratings ($M_{\text{green rating}} = 5.64$, $SD_{\text{green rating}} = 1.23$; $M_{\text{brown rating}} = 3.33$, $SD_{\text{brown rating}} = 1.64$) and a non-significant main effect of environmental concern ($M_{\text{high EC}} = 4.38$, $SD_{\text{high EC}} = 1.92$; $M_{\text{low EC}} = 4.58$, $SD_{\text{low EC}} = 1.78$). However, these main effect results are qualified by the significant ratings $\times$ environmental concern interaction effect. As demonstrated in Fig. 2, as compared to participants with low environmental concern, those with high environmental concern perceived their assigned brands to be greener when the rating was green ($M_{\text{high EC}} = 5.72$, $SD_{\text{high EC}} = 1.14$; $M_{\text{low EC}} = 5.56$, $SD_{\text{low EC}} = 1.30$) and perceived their brands to be browner when the rating was brown ($M_{\text{high EC}} = 3.02$, $SD_{\text{high EC}} = 1.56$; $M_{\text{low EC}} = 3.63$, $SD_{\text{low EC}} = 1.65$). This result supports hypothesis 2 which predicted third-party green-brown ratings would exert a greater effect on brand greenness perceptions among consumers with high (vs. low) environmental concern. The ANOVA results further supported hypothesis 4 which predicted a significant main effect of prior brand loyalty on brand greenness perceptions (see Table 2). The loyal group perceived their assigned brands to be significantly greener as compared to the non-loyal group ($M_{\text{loyal}} = 4.74$, $SD_{\text{loyal}} = 1.56$; $M_{\text{non-loyal}} = 4.26$, $SD_{\text{not loyal}} = 2.04$). Finally, the ANOVA showed a significant ratings $\times$ prior brand loyalty interaction effect (see Table 2), which was mainly due to significantly browner brand perceptions among the non-loyal group than the loyal group in the brown rating condition (see Fig. 2). This result, thus, provides further support for hypothesis 4.

4.2.4. Correlation analysis (hypothesis 5)

Hypothesis 5 predicted that the relationships between perceived validity and perceived brand greenness would vary depending on the consumer's prior brand loyalty and whether the third-party rating is green or brown. Pearson bi-variate correlations were run between perceived validity and perceived brand greenness for each of the four loyalty $\times$ rating groups. Results revealed support for hypothesis 5 in that when the third-party rating was green, the correlation was significant and positive for both the loyal ($r = .50, p < .001, n = 151$) and non-loyal ($r = .57, p < .001, n = 240$) groups; however, when the third-party rating was brown, the correlation was significantly negative for the non-loyal group ($r = -.27, p < .001, n = 183$) but non-significant for the loyal group ($r = .12, p = .074, n = 212$). These results suggest that even if the brown rating was believed, the loyal group's perception of how green the brand was unaffected.

5. Discussion

5.1. Theoretical Implications

Within the theoretical framework of cognitive dissonance and the underlying mechanism of biased assimilation, this study reveals the intricate mechanisms in which the two consumer involvement factors--prior brand loyalty and environmental concern-- alter consumers' reactions to third-party green-brown rating information about a brand. Specifically, this study focuses on how consumers' perceptions of the validity of the rating and the brand's greenness are affected by these personal involvement factors.

This study demonstrates that prior brand loyalty acts as a catalyst for the biased assimilation of third-party green-brown rating information. First, prior brand loyalty interacts with whether the third-party rating is positive (green) or negative (brown) to bias consumers' judgment of the information validity. Specifically, consumers are more likely to deny the believability of the rating when it indicates that the brand they are loyal to is brown (as opposed

to green), whereas they believe both green and brown rating information equally if it is about brands to which they are not loyal (hypothesis 3). This result indicates that brand loyal consumers consider information that corroborates their existing cognition (green rating) more believable than information that contradicts it (brown rating), a symptom of biased assimilation.

Second, prior brand loyalty further biases consumers by making them pay less attention to the truthfulness of the brand's brown rating (hypothesis 5). That is, loyal consumers maintain their perception of the brand's greenness even if they accept the validity of the third-party brown rating. This result may be because brand loyal consumers erroneously interpret the meaning of the brown rating to be greener than it actually is. For example, when a brand obtained two leaves according to Greenopia's four-leaf rating system (the more leaves, the greener), loyal consumers might think "Wow, they received two leaves!" instead of "What? They received only two leaves?" Alternatively, this result may be because while loyal consumers admit the brown rating is trustworthy according to the criteria set forth by the third-party rating system, they actively search further in their memories for evidence to support their belief that the brand is green in other ways. This proposed alternate "greenness" may result in downgrading of the significance of the given third-party brown rating information for judging the overall greenness of the brand. As compared to loyal consumers, non-loyal consumers do not have well-established attitudes towards the brand, and thereby lack the drive to either interpret the third-party rating in a biased manner or search for further evidence affirming or contradicting the rating information.

By denying the validity of the brand's brown rating information while enthusiastically accepting the validity of its green rating information, by mistakenly interpreting the brand's brown rating information to be greener, or by finding other reasons to believe the brand is green in the face of the brown rating, loyal consumers' strong attitudinal and behavioral commitments

to the brand ultimately color the lens of their eyes greener than that of non-loyal consumers, resulting in overall greener perceptions of the brand (hypothesis 4).

With regard to the role of environmental concern, this study reveals that environmental concern augments the effect of the third-party ratings on consumers' perceptions of the brand's greenness (hypothesis 2). The same third-party rating information results in more extremely green or brown brand perceptions among consumers with higher environmental concern. However, this is not necessarily because consumers with higher environmental concern believe the trustfulness of the rating information more, given the rejection of hypothesis 1, but probably because they take the rating information more to their hearts due to its personal relevance and meaningfulness and thus let it influence their thoughts about the brand to a greater extent. In this sense, environmental concern plays a different role from that of prior brand loyalty. Whereas prior brand loyalty colors the brand to be greener whether its third-party rating is green or brown, the influence of environmental concern on the biased assimilation of a brand's third-party rating is bi-directional, making green ratings perceived greener and brown ratings browner.

5.2. Managerial Implications

Findings of this study suggest that firms must be keen to their customer profile in terms of their environmental concern and brand loyalty in order to evaluate the relative return on investment in improving green ratings or earning green labels for the brands and taking actions in response to brown ratings. The roles of prior brand loyalty and environmental concern elucidated in this study with regard to consumers' responses to third-party rating information provide several managerial recommendations for brands with both green and brown ratings.

For brands rated to be green by third-party organizations and promoted as green brands, third-party green ratings can be effectively used in marketing messages targeting existing

customers to reinforce their brand loyalty. This is because third-party green ratings are more enthusiastically believed and more favorably reflected in brand greenness perceptions among loyal consumers than non-loyal consumers. However, in order to attract new customers, brands should carefully evaluate the use of third-party green ratings because even though non-loyal customers consider third-party ratings to be valid, these ratings may not enhance their brand greenness perceptions, especially if they have low environmental concern. Thus, to attract new customers, marketing messages that incorporate additional anecdotal information such as tangible stories regarding a brand's involvement with the environment may be beneficial. Anecdotal details may promote the persuasiveness of the numerical evidence of the third-party rating and enhance the vividness of the green claim (Small, Loewenstein, & Slovic, 2007) for new, not-yet-loyal consumers.

Further, in the current study where the third-party green-brown rating information was presented to participants in the form of a news article instead of the brand's ad claim, the rating information was perceived as equally valid regardless of consumers' environmental concern levels. This result may appear to contradict existing literature in which consumers with less environmental knowledge were found to consider green ad claims as more misleading and deceptive (e.g., Chang, 2011; Kangun et al., 1991). However, the literature also suggests that consumers rely on third-party endorsements as a means to simplify the task of determining product quality, such that third-party endorsements enhance perceived quality (Chen & Xie, 2005), and that third-party endorsements are considered more credible in the absence of advertising (De Maeyer & Estelami, 2011). Therefore, to prevent the skepticism of consumers, especially those with low environmental concern, and maximize the positive impact of the green rating, firms that desire to utilize a green rating from a third-party organization in their marketing

may be wise to get the words out to consumers through independent third-party sources (e.g., news articles) rather than through their own advertising.

On the other hand, firms with a brown rating from a third-party organization may need to minimize its potential negative effect by taking actions customized for different consumer groups. This study suggests that a brown rating may not be as detrimental to loyal customers as to non-loyal consumers, even if the validity of the rating is accepted. Non-loyal consumers are more likely to believe a brand's brown rating and generate a browner brand perception. This study also shows that brown ratings produce browner brand perceptions among more environmentally concerned consumers. These two findings, combined, suggest that when a firm expands to a new market with a brand with a brown rating, they need to take strategic actions to curtail the potential negative impact of this brown rating even if greenness is not the brand's major selling point. This is especially important if the brown rating information is widely known to consumers via third-party sources such as news articles. With consumers increasingly focused on sustainability, the chances are that any new markets will consist of a significant number of consumers with high environmental concern. Thus, even if a brand does not make a green claim, it may need to consider providing counter-arguments that can cast suspicion on the validity of the brown rating to restrict its effect on consumers' brand perception.

5.3.Limitations and Recommendations

Although our findings provide valuable insights regarding consumer responses to third-party green-brown ratings, some cautionary notes are warranted. First, this study used a quasi-experiment with stimuli containing existing third-party ratings of existing brands. Although this design enhances the external validity of the findings, a fully counter-balanced brands $\times$ green-brown ratings design would eliminate any potential confounding effects. Second, the quasi-

experiment set up also limited the control over participants' characteristics and environments in which they participated in this study. Future research examining this topic could use a more controlled experiment that allows manipulation of subjects' level of attention to environmental issues and/or prior image of the brand could generate additional evidence for the internal validity of the findings. Next, this study used mock news articles to communicate third-party green-brown ratings to participants. As discussed earlier, the use of news articles might have produced different results as compared to using other communication contexts (e.g., ad messages, word-of-mouth, social networking sites). Future research should compare the effects of a variety of message sources on how consumers respond to third-party green-brown ratings. Fourth, the third-party green-ratings used in this study were descriptive and based on scores on a set of evaluative criteria, but did not make any overall recommendations. However, existing ratings often use a recommendation format that selects winners among competitors (Chen & Xie, 2005). Recommendation format ratings may have an affective appeal due to their more personal tone. Future research can probe possible differential effects of diverse types of ratings. Fifth, this study used third-party rating sources assumed to be relatively well-known for their fairness and rigor. However, whether such an assumption held true among the study participants was not verified. Future research that investigates the role of source awareness or source reputation along with environmental concern and other variables from this study will be useful. Next, perceived validity and perceived brand greenness were measured in this study using single-item scales. Future research is warranted to develop more detailed measures of these variables. Finally, this study addressed how third-party green-brown ratings lead to consumer perceptions but not their purchase behavior. A controversy exists as to whether investment in green ratings can translate into market performance. Therefore, research addressing the effect of third-party ratings on

consumers' purchase behavior and contextual or individual moderating variables for this effect is needed.

5.4. Conclusion

Sustainability has become one of the key areas of interest among various stakeholders. A cursory consideration of third-party green-brown ratings suggests that they can be effective indicators of environmental responsibility and may be linked to profitability. However, this study reveals that third-party green-brown ratings, consumers' perceived validity of those ratings, and their resulting brand greenness perceptions do not always correlate with each other. Personal involvement factors such as brand loyalty and environmental concern can produce differential acceptance and interpretation of third-party green-brown ratings.

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Fig. 1. Conceptual model and hypotheses

Fig. 2. Mean scores. EC = environmental concern

Table 1.

Brands and green-brown rating information used in the experimental stimuli (mock news articles)

Condition	Brand	Green-Brown Rating Information ^a
Green Rating	Method ^b	Obtained U.S. Environmental Protection Agency's Design for the Environment label and a GoodGuide rating of 8.7 (out of 10)
	Patagonia ^c	Obtained 4 leaves from Greenopia on a four-leaf rating system (4 = meeting most stringent criteria)
	Nike	Scored 93.28 points (out of 100) in the total green score, ranked 1st in the consumer products sector according to Newsweek Green Rankings 2009.
	Walmart	Scored 80.38 points (out of 100) in the total green score and 100 points (out of 100) in the reputation survey score according to Newsweek Green Rankings 2009.
Brown Rating	Coca-Cola	Obtained 2 leaves from Greenopia.
	Gap	Obtained 1 leaf from Greenopia.
	Nescafe ^b	Obtained 0 leaf from Greenopia.
	Kraft ^b	Obtained 4.3-4.7 points (out of 10) from GoodGuide.

^a All rating information was as published on the source agencies' websites as of April 10-12, 2010.

^b These brands operate in multiple product categories, so a selected product category was provided for each of these brands in the mock news article along with the brand name (i.e., Method for glass cleaner, Nescafe for instant coffee, Kraft for instant mac and cheese products),

^c Full content of an example mock news article (Green rating-Patagonia):

Patagonia brand scored **4 leaves** according to the **Greenopia** (<http://www.greenopia.com>) **four-leaf rating system** as of April 11, 2010. Greenopia publishes product and business ratings according to their four-leaf rating system to provide consumers with high quality information about the overall greenness of products or businesses and help consumers reduce (negative) impact on the environment through their daily purchasing decisions. Businesses with **4 leaves meet Greenopia's most stringent criteria**, while businesses with **1 leaf meet their minimum qualifying standards**. In order to determine leaf scores for retailers such as Patagonia, Greenopia used 6 criteria including green building design, sustainable supply chain, recycling/take-back programs, the percentage of green products carried by the retailer, sustainability reporting, and the use of green power. **Patagonia met** Greenopia's standards in all criteria.

Table 2.

ANOVA results

Dependent Variable	Source ^a	<i>MS</i>	<i>F</i> (1,778)	<i>p</i>	partial η^2
Perceived validity of a brand's third-party green-brown rating information	GBR	4.78	5.64	.018*	.007
	EC	1.28	1.50	.221	.002
	PBL	22.72	26.71	.000***	.033
	GBR $\times$ EC	.35	.41	.524	.001
	GBR $\times$ PBL	8.95	10.52	.001**	.013
	EC $\times$ PBL	.92	1.08	.299	.001
	GBR $\times$ EC $\times$ PBL	2.82	3.32	.069	.004
Perceived brand greenness	GBR	1095.66	611.29	.000***	.440
	EC	6.20	3.46	.063	.004
	PBL	133.17	74.30	.000***	.087
	GBR $\times$ EC	28.99	16.18	.000***	.020
	GBR $\times$ PBL	65.57	36.58	.000***	.045
	EC $\times$ PBL	2.51	1.40	.237	.002
	GBR $\times$ EC $\times$ PBL	2.40	1.34	.248	.002

^a GBR = third-party green-brown ratings (green vs. brown), EC = environmental concern (high vs. low), PBL = prior brand loyalty (loyal vs. non-loyal). * $p < .05$, ** $p < .01$, *** $p < .001$