Arguing the Value of Product Quality Signaling in the Presence of Negative Publicity

Quey-Jen Yeh
National Cheng-Kung University, Taiwan

Drawing on argumentation and signaling theories, this study designs an escalating warrant model and examines the manner in which it connects to the influence of negative publicity. A parsimonious framework is developed for forming the multiple product warranties and assessment of the separate and simultaneous effects. The experiment shows that consumers do reason with sellers' product quality information, while they are easier to convince and infer a higher level of seller credibility when there are more types of warrant. However, this positivity can be reversed and cause significantly greater damage to the seller's standing in the face of negative publicity.

INTRODUCTION

Information asymmetry grants sellers better knowledge about the quality of their products than consumers have, especially for experience goods (Akerlof, 1970; Spence, 1974; Rap & Nergem 1992; Fang, Gammoh & Voss, 2013). Seeking to reduce their risk and avoid being cheated, consumers seek extrinsic market cues of unobservable product quality (Chatterjee, Kand & Mishra, 2005). In response, sellers issue product claims, from which consumers draw inferences and product quality predictions. By reasoning on the basis of the available data and evidence provided by sellers, consumers determine the argument in practice. Analyzing such claim–inference links to clarify the communication structure between two parties, such that one side seeks to interpret the claim and signals issued by the other party as credible or not in practice, is important (Toulmin, 2003). Yet insufficient empirical studies describe how consumers assess product quality cues from an argumentation perspective.

Signaling theory identifies multiple marketplace quality cues that high-quality sellers can use to distinguish their products from those of lower quality providers (Kirmani & Rao, 2000), such as advertising (e.g., Kihlstrom & Riordan, 1984), price (e.g., Bagwell & Riordan, 1991), brand, reputation (e.g., Erdem & Swait, 1998; Rao, Qu & Ruekert, 1999), warranties, and third-party certification (e.g., Wiener, 1985; Boulding & Kirmani, 1993; Chatterjee et al., 2005; Dewally & Ederington, 2006; Chu & Chintagunta, 2011; Akdeniz, Calantone, & Voorhees, 2012; Fang, Gammoh, & Voss, 2013). Although their marketing purposes differ, these signals are similar in their effects for reducing information asymmetry, because they enable consumers to make their own quality inferences about unobservable product features (Kirmani & Raom 2000). Sellers also provide multiple cues, including both marketing-related signals (e.g., packaging, advertising, warranties) and nonmarketing-associated ones (e.g., third-party reviews) (e.g., Akdeniz et al., 2012). In the food industry for example, sellers often provide warranties (e.g., "Money back if not satisfied") together with certification information (e.g., "USDA organic"). Third-party certifications differ from warranties in that they require upfront investments by the seller, to meet the standards for accreditation by a certifying institution (Rao et al., 1999). This additional

layer of complexity in the quality evaluation process demands further investigation, to explicate how the signals might combine to induce greater recognition (Akdeniz et al., 2012).

Therefore, this study seeks to address two key quality signaling research questions. First, drawing on Toulmin's (1958, 2003) arguments and Brockriede & Ehninger's (1960) warrant theory, we investigate if more different signals cause consumers to deem quality information more credible. We propose an escalating quality signaling model, which starts with product features, then adds signals pertaining to the warranty, insurance, and third-party certification, to test this notion. Second, drawing on negative publicity (Mizerski, 1982; Dean, 2004) and negativity effect (Herr, Kardes & Kim, 1991; Ahluwalia, 2002) theory, we consider perceived credibility changes of seller's standing that result from the influence of situational information, in interaction with consumers' quality concerns. To test this effect, we investigate a negative context, because adverse situations tend to have greater influences on consumption-related attitudes (Herr et al., 1991; Dean, 2004).

In turn, this study makes several contributions to quality signaling research. First, we provide a parsimonious conceptual framework for describing the presence of multiple product warranty signals and assessing their separate, simultaneous, and relative effects. Second, the related experiment reveals that more warrants result in greater perceptions of credibility-related information. However, this positive effect reverses and becomes significantly negative if a negative product incident prompts consumers to shift their focus away from the seller-provided signals and toward the negative information. Consumers also might be less tolerant of sellers that bluff and try to cheat them by issuing signals of quality but not genuine quality. We also show that consumers' sensitivity to quality, rather than price or convenience, moderates this negative effect.

ARGUMENT PATTERNS

In practice, people rarely apply highly disciplined logic, but a consistent argument model can explicate their implicit practical reasoning structures (Toulmin, 1953; 2003; Berente, Hansen, Pike & Bateman, 2011). Toulmin (2003) identifies six elements that constitute an argument in practice: claims, data, warrants, backing, qualifiers, and rebuttals. Thus an entity makes an explicit claim and substantiates it with data and warrants, to persuade others to accept it, while also anticipating counterclaims or disputes. A claim in this context refers to "the conclusion whose merits we are seeking to establish," and the data are "the facts we appeal to as a foundation for the claim" (Toulmin, 2003, p. 90). Warrants connect the claim with its supporting data, such that they reflect the principles of inference that indicate whether moving from the data to the claim is appropriate (Berente et al., 2011). Backing pertains to other assurances, without which the warrants would possess no authority (Whithaus, 2012).

This theory has been applied successfully in empirical studies in various contexts, including business ethics (Schmidt, 1986), classroom discourses (Jimenez-Alexiandre, Rodriguez & Duschl, 2000), Internet learning (Clark & Sampson, 2007), website Q&As (Savolainen, 2012), organizational studies (Green, Li & Nohria, 2009), and virtual worlds (Berente et al., 2011). Yet experiments based on argument theory still confront challenges. In particular, scholars have questioned how to distinguish objectively among the data, warrant, and backing elements (e.g., Clark & Sampson, 2007). The difficulty associated with differentiating data from warrant, and warrant from backing, can produce inaccurate results (Savolainen, 2012). In addition, because qualifiers serve as the boundary of a claim, and rebuttals envisage its objection, these two elements are not forms of evidence but rather are field-dependent actions that may alter the direction of an argument (Whithaus, 2012). Argumentation is not restricted to dealing with overt disagreements or establishing what is objectively true; it also can constitute the details of what a person considers to be true (Savolainen, 2012). Therefore, some limited models exclude qualifiers and rebuttals and employ only the first four elements—claim, data, warrants, and backing—to verify the claim–evidence relationship associated with an argument. Eeduran, Osborne & Simon (2005) also recommend collapsing data, warrants, and backing into a single "grounds" category that reflects the structural aspects of an argument. Fairclough (2003) instead suggests three core patterns: claim, grounds, and warrants, where grounds denote data or evidence, and warrants include backing. Savolainen (2012) instead applies a composite grounds category together with two new components, counterclaim and support, in his conceptual framework.

These diverse applications and models concur about the legitimacy of a limited version of Toulmin's (2003) model for everyday discourse though. A limited argument process, which moves the recipient from a naïve or unforeseen status to a claim, through the endorsement of various warrants, is analogous to the process by which sellers deliver product quality cues to consumers to relieve their doubts or increase their trust. Although the connections depend on the field, product feature descriptions tend to be explicit, similar to data, whereas warranties or certifications are implicit, similar to warrants assured by backing (Brockriede & Ehninger, 1960). Therefore, we focus on the composite category of warrants as factors that form the argument underlying quality claims.

STUDY 1: NUMBER OF WARRANTS AND THE ESCALATING EFFECT

Studies of signaling theory usually assume that the parties involved in a deal possess different amounts of information, and this difference in the information and the terms of deal between the parties, or information asymmetry, significantly affects the deal (Akelof, 1970; Spence, 1974). To achieve better balance, the parties that possess more information, such as sellers, send "warrants" to support the claims they make.

On the basis of the monetary costs incurred, Rao et al. (1999) identify two broad categories of quality signals: dissipative, such as certifications, which require upfront expenditures to meet accreditation standards, and nondissipative, such as warranties, which do not demand upfront investments but promise compensation for future losses if the quality claim fails. Kirmani & Rao (2000) refer to these two types as default-independent and default-contingent signals, because monetary detriments depend on whether firms default on their claims. Akdeniz et al. (2012), in comparing the moderating influences of brand reputation and third-party reviews, instead suggest labeling certifications as nonmarketing-controlled cues, whereas brand, price, and warranty represents marketing-controlled cues. With their focus on consumption behavior, Chatterjee et al. (2005) regard certifications as promotion focused and warranties as prevention focused, because consumers are motivated to seek some gain (certification) or avoid some loss (warranty). Across these different frameworks though, regardless of whether the purpose is financial or marketing, product quality cues serve as warrants for arguments, designed to inspire consumers to move from a sense of doubt toward trusting the seller's claim as appropriate.

Brockriede & Ehninger (1960), using Toulmin's (1958) theory, identify seven types of warrants: cause, sign, generalization, analogy, parallel case, authority, and principle. Berente et al. (2011) study discursive sensemaking by business professionals in a virtual word and recategorize the warrants into five modes of rationality, related to various theories associated with information, cognition, institution, and organizational values. For example, *causal* refers to rational sensemaking based on information processing and contingency theories; *analogy* and *parallel* constitute anchored sensemaking, in relation to experienced phenomena, reflecting theories of social representations and frames of reference; *sign* implies mimetic sensemaking generated through imitation; and *authority* relies on standards, founded on institutional and cultural norm theories.

We adopt Berente et al.'s (2011) warrant model of argumentation to design an escalating warrant model of product signals as claims. We assume equal effects across various warrants, even though some signals for some products may be more effective than others, which might depend on investment amounts (e.g., Chatterjee et al., 2005; Dewally & Ederington, 2006). Our model comprises four warrant arrays of different types, starting with product features (causal warrant), escalating in stages to a money-back guarantee (analogy warrant), insurance (authority warrant), and certification (authorized sign warrant). Because consumers often consider each product cue in reference to the others, we propose that consumers use sellers' claims of various warrants in product signaling to argue to themselves about the amount of warrants contained in the claim, as well as whether the warrants are comprehensive and useful for supporting that claim. Thus,

  H1: When there are more warrants of different kinds in a seller's product claim, consumers self-argue that the seller offers a stronger warrant and believe that the warrants are more comprehensive and useful to allow them to accept the claim.

H2: Consumers' perceptions of a seller's credibility increase with the number of warrants self-argued by consumers in support of the claim of the seller.

STUDY 2: INFLUENCE OF NEGATIVE INFORMATION ON WARRANTS

Marketers hope that their target consumers' positive impressions of product warrants enhance their brand's standing. However, problems can arise if the warrants are involved with negative publicity that damages the brand's public credibility. Despite the need for attention to this potential effect, academic literature seldom considers the influence of reversed credibility, in accordance with elaborations on warrant signaling.

Publicity is more influential than company-controlled activities (Bond & Kirshenbaum, 1998). A wealth of scholarly examples reveal its benefits and risks, including the outcomes for firm reputation, goodwill, and publicity (Decker, 2012); interactions of advertising coupled with positive and negative publicity (Kim, Yoon & Lee, 2010); anger and negative word of mouth due to crises that lower product purchases (Coombs & Holladay, 2007); the effect of negative publicity on celebrity endorsements (Thwaites, Lowe, Monkhouse & Barnes, 2012); and claims of corporate social responsibility in crisis communication, as a means to counter negative publicity (Vanhamme & Grobben, 2009). Most research affirms a stronger effect of negative information on people's beliefs and judgments compared with similar amounts of neutral or favorable information (e.g., Baumeister, et al., 2001; Kensinger & Corkin, 2003). People tend to weight negative information more than positive information in evaluating people, objects, and ideas (Mizerski, 1982). Because of its higher credibility and the negativity effect, popular media also prefer to report bad news (Dennis & Merrill, 1996).

On the basis of negativity effect theory, Louie & Obermiller (2002) show that after a negative event, consumers develop more unfavorable attitudes toward an endorser they perceive as responsible than one that they regard as irresponsible. White et al. (2009) go further and explain the phenomenon according to transference of affect theory, such that negative meaning becomes part of the endorser's bundle of meaning, and consumers metaphorically transform them into perceptions of the endorsed product. Thwaites et al. (2012) also show that negative publicity has the most damaging impact when a celebrity signal appears well matched with a product, in terms of the celebrity's credibility, but the impact is less severe when the celebrity's signal constitutes a poor match with the endorsed product. The better the match, the greater the discontent when the promised credibility gets damaged by negative information. Chatterjee, Kang & Mishra (2005) indicate that consumers associate a warranty or certification with judgments of power; consistent with their elevated expectations, they express greater dissatisfaction if the signal proves to be false. Similarly, consumers should perceive less credibility in a claim with multiple types of warrants than in one with fewer types when they confront negative information. Thus,

H3: Negative information negatively influences consumers' perceptions of a seller's credibility in relation to its claim of a product warrant; the magnitude of this negative influence increases with the number of different warrants signaled in the claim.

Signals attract consumers differently, depending on their tendency to engage spontaneously in effortful thinking (Cacioppo & Petty, 1982). Those who are more thoughtful are more likely to engage in complicated thinking and trace information cues. Chatterjee, Kang & Mishra (2005) assert that three issues likely moderate the relative persuasive power of signals to consumers: (1) need for cognition, which implies that cognitive sophistication is required to recognize relative signaling nuances (Cacioppo & Petty, 1982); (2) a motivation to seek gain or avoid losses, in line with regulatory focus theory (Higgins, 1997); and (3) information that conflicts with the signal, according to an information processing perspective (Maheswaran & Meyers-Levy, 1990), which asserts that consumers are more careful when processing negative information, because the publicized information does not come from the sellers, so they consider it more objective.

Previous research on the boundary conditions of negativity effects also identifies a difference between committed and non-committed consumers when they process the same negative information. Ahluwalia et al. (2000, 2002) show that committed consumers tend to counterargue against negative information about a beloved brand rather than passively accept it; non-committed consumers accept it.

Thwaites et al. (2012) study different levels of product involvement and their effects in moderating the influence of negativity on consumers' attitudes toward endorsers' credibility. Consumers who exhibit sophisticated thinking are less likely to take publicized negative information for granted. In turn, consumers who focus more on quality should be more likely to confirm the nature of the quality warrants, to which they pay routine attention. Thus, with regard to customers focused on quality or on other elements, we predict:

H4: Consumers' quality concerns moderate the influence of negative information on their perceptions of a seller's credibility in relation to its claim of a product warrant, such that the negative impact is weaker for consumers who have a stronger quality focus than among those with a weaker quality focus.

EXPERIMENTAL PROCEDURE

Quality Signaling Model of Escalating Warrants

To examine the research questions, we adopt an experimental approach with two hypothetical situations to measure changes in perceived credibility due to a negative publicity incident. Experimental approaches have been used widely to test the significance and implications of crisis management (Laufer et al., 2005; Lee, 2004; Siomkos & Kurzbard, 1994). In the first stage, we present the scenario design and the seller's quality signaling, with bubble tea as the focal product. This Taiwanese product refers to a wide variety of small, refreshing tea beverages that stores can serve cold or hot, with chewy, natural tapioca balls that consumers suck up through a fat straw. Its average price is about US$2 for each 400 cc cup (~TW$60). Taste, price, quality, and food safety are the central selection attributes. In addition, a series of well-publicized food safety incidents in Taiwan recently make this product setting appropriate (http://en.wikipedia.org/wiki).

As illustrated in FIGURE 1, Experiment 1 comprises four scenarios that tell a similar story but vary in their signals of quality warrants, escalating from one to four warrants of different types. The first scenario provides only the product attribute information as the warrant: "100% Natural Tea Drink, Absolutely Nothing Artificial!" The second scenario describes the same product attributes but also adds a warranty to induce a sense of gain if something bad were to happen, to facilitate risk avoidance: "Guaranteed Compensation of US$16 if Found Fake by Governmental Food Safety Regulation!" (i.e., eight times the original price). A third scenario goes further by adding a large, insured monetary compensation: "US650,000 Insurance to Cover All Losses!" (325,000 times of the original price, which makes the payback difficult to count). Finally, the fourth scenario included a third-party certification, with the statement, "International SGS Certification: No. VA/2013/57439," appearing next to a bright-colored, round logo with mark "ISO 9001 and SGS System Certification."
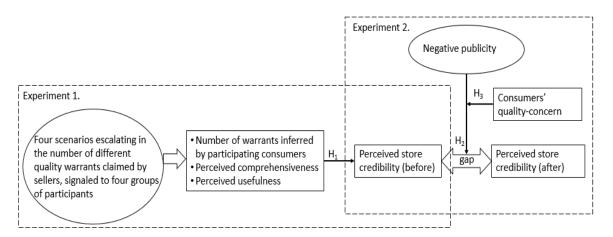
The story for Experiment 1 indicates that two friends walk by a tea store and see a machine that standardizes the amount of sugar included in the tea. They start talking about how well the machine could help the tea store and shorten customer wait times, thus improving the efficiency of the purchase process. During this conversation, they also see the store's claim of "warrants" for its tea products. Each participant then read one of the four escalating warrant scenarios, through a random assignment. Next, participants completed the first part of a questionnaire, which measured their awareness of the number of warrants signaled in the scenario, their perceptions of the comprehensiveness and usefulness of product quality information revealed in the scenario, and their overall perceptions of the credibility of the store. The respondents were 180 graduate and undergraduate students at a large university in Taiwan.

These same participants then continued on to Experiment 2, which presented a news report by a well-recognized consumer foundation that explains:

> Recently it has become popular for local tea stores to use a kind of sugar-giving machine in tea making (a picture of the machine is attached). Although it expedites the process, according to our recent tests, the machine seems unable to function with naturally made cane sugar, because it can only fully process thick liquid. Natural sugar instead is made of natural water and easily crystallizes at room temperature. Therefore, stores that use these machines probably are using non-natural sugar in their tea products. Consumers diagnosed with the following diseases should

avoid consuming too much artificial sugar: blood vessel disease, fat liver, high pressure, diabetes, dementia, etc.

After reading this news report, the participants completed the second part of the questionnaire, which featured the same store credibility measures and also asked for demographic data (gender, age, tea purchasing frequency), and ratings of the participants' personal attention to food safety in their daily practices (1 = very rare to 5 = very often).

FIGURE 1
THE RESEARCH FRAMEWORK

Measurements
Manipulation Check.
   To check the validity of the escalating warrant model, we used a single item and asked participants to indicate how many warrants they found in Experiment 1. Rebuttals are anticipated, and biases are possible in argument claims (Toulmin, 2003). Therefore, the number of warrants self-argued by participants should match the actual number of warrants signaled, to confirm validity.

Argument Comprehensiveness and Usefulness.
   These two measures pertain to consumers' sense of the comprehensiveness and usefulness of the information contained in the four escalating warrant scenarios. Argument comprehensiveness consists of three self-reported items pertaining to the completeness, sufficiency, and accuracy of the claim (Siegal, 2003; Bailey and Pearson, 1983). Information usefulness also comprises three items, asking participants if they perceive that the information is valuable, informative, and helpful (Siegal, 2003; Bailey & Pearson, 1983). Both measures use two-sided, seven-point, question-based option scales (e.g., incomplete– complete, insufficient–sufficient, not valuable– valuable). Thus, a rating at the midpoint of 4 implies a neutral evaluation. Confirmatory factor analyses indicated the discriminant and convergent validity of both measures. The Cronbach's alpha reliabilities were 0.911 for comprehensiveness and 0.901 for information usefulness.

Store Credibility Change due to Negative Publicity.
   We measured consumers' perceptions of the store's credibility, in response to the four escalating warrant scenarios, both before and after they read the negative publicity report. The six items include questions about whether the store is experienced, skillful, possessed of know-how, trustworthy, dependable, and honest (modified from Newell & Goldsmith, 2001). The first three items thus refer to professionalism, and the latter three are about reliability. The factor analysis suggested integrating these six items into one factor for both the pre- and post-publicity situations. Confirmatory factor analyses also revealed satisfactory discriminant and convergent validity; the Cronbach's alpha reliabilities were 0.884

and 0.893, respectively. The difference between the pre- and post-publicity ratings, "after minus before", indicated the changes in perceived store credibility, due to negative publicity.

RESULTS

Manipulation Check

TABLE 1 first verifies whether the escalating effects among the four warrant scenarios are recognized by the participating consumers using the following regression model:

Number of warrants inferred by consumers = $0.79^* \times$ Product features $+ 0.48^{**} \times$ Money back $+ 0.87^{***} \times$ Insurance $+ 0.72^{***} \times$ Certification [claimed by sellers]
(1)

where, as designed, each warrant is set as a (1, 0) binary variable in terms of the four warrant scenarios, starting with a simple description of the product features, then a warrant is added each time in the order of money back warranty, insurance compensation, and third-party certification ($^{***}p < 0.001$, $^{**}p < 0.01$, $^*p < 0.05$).

The model has a R^2 value of 0.532 and an F value of 27.903^{***}, and the four β coefficients are all significant, thus confirming the escalation. The higher significance of the β values in model (1) also suggests that the effects of the two warrants that are backed up by a third party, namely insurance (β = 0.87, p < 0.001) and certification (β = 0.72, p < 0.001), are more significant than the two self-supported warrants of product features (β = 0.79, p < 0.05) and a money-back guarantee (β = 47, p < 0.01).

Different Warrant Types Make the Information More Convincing

TABLE 1 also illustrates the standard errors associated with the β coefficients and the differences in the perceived usefulness and comprehensiveness of the information between the escalating warrant scenarios of the seller and the number of warrants inferred by the consumers. FIGURE 2 goes further to give a graphic interpretation of these variables. Together, these numerical and graphic data explain that the warrants inferred by consumers deviate from those that the sellers intend to deliver. Through self-argument, the participating consumers decide what they consider to be true regarding the claims of the sellers, and generate their own ideas regarding the information to argue for the quality. Apparently, according to the findings in TABLE 1 and FIGURE 2, when sellers claim more types—not just quantity—of warrants, consumers acknowledge a larger number of warrants and in turn find the information to be more comprehensive and useful. Thus, in support of H1, we conclude that consumers do argue with sellers' product cues, and that they are easier to convince when there are more types of warrants available.
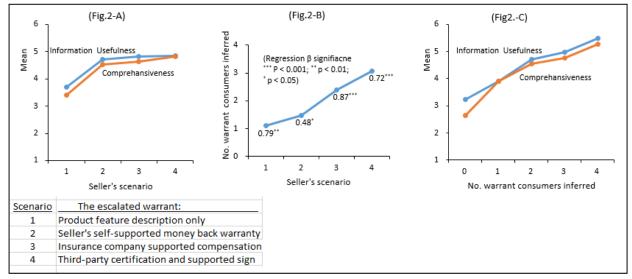
TABLE 1
SIGNIFICANCE OF THE FOUR WARRANT SCENARIOS, NO. OF WARRANTS INFERRED AND THEIR INFORMATION COMPREHENSIVENESS AND USEFULNESS

Scenario		No. of warrants inferred by consumers							Perception [b. c.]	
No. of warrant claimed by seller	The escalated warrant	0	1	2	3	4	Average	β [a. b.] coeff.	Useful ness	Compr ehensi veness
1 (N=40)	Product features only	8	20	12	0	0	1.0	0.79^*	3.7	3.4
2 (N=42)	Money back	5	18	13	6	0	1.5	0.48^{**}	4.7	4.5
3 (N=49)	Insurance	0	5	24	16	4	2.4	0.87^{***}	4.8	4.6
4 (N=49)	Certification	0	0	11	23	5	3.1	0.72^{***}	4.9	4.8
	Usefulness	2.7	3.9	4.6	4.8	5.2	F-value:$8.71^{***\ b.\ d.}$			

					F-value: $9.17^{***b.d.}$
Comprehensiveness	3.2	3.9	4.7	5.0	5.5	

a. Result of regression with each warrant set as (0, 1) binary

b. The model controlled the effects of sex, education, monthly allowance, and purchase frequency.

c. The differences are only significant between the first two.

d. The differences are significant between each pair of the four scenarios.

*** P < 0.001; ** p < 0.01; * p < 0.05

FIGURE 2
EXPLANAITON OF TABLE 1 IN TERMS OF DIAGRAMS

Scenario	The escalated warrant:
1	Product feature description only
2	Seller's self-supported money back warranty
3	Insurance company supported compensation
4	Third-party certification and supported sign

The More Inferred Warrants, the Higher the Store Credibility

Store credibility concerns the consumer-based perception of a store's overall standing, whereby its relations with particular product warrants are apparently not direct. Moreover, as addressed, due to argument deviation, the inferences of consumers often differ from those intended by the sellers. Thus, it is the consumers' interpretation of the sellers' cues that counts. This divergent and indirect relationship suggests that a seller's product cues affect store credibility through the consumers' inferences. A mediation approach, which considers the mediation of a consumer's inferred number of warrants and their usefulness and comprehensiveness for argument, is thus applied to solve the connection. Several criteria must be met to demonstrate that the value differences account for a mediator: first, the assumed mediator should predict the dependent variables; second, when the mediator and independent variables are simultaneously entered into a model to predict the dependent variable, the coefficient of the independent variables should decrease, and the coefficient of the mediator should be less affected (Baron & Kenny, 1986). The effects of the demographic variables are controlled.

Following these criteria, TABLE 2 shows the results of three models: Model 1 refers to the effect of a single warrant claimed by the seller, Models 2 insert the mediator of number of warrants inferred by consumers, and Model 3 inserts all variables, including information usefulness and comprehensiveness. Comparing these three models, it can be seen that the significant effect given by the single variable of a seller's claimed warrant in Model 1 disappears in Models 2, when the consumer's inferred number of warrants enters and has a significant effect. In Model 3, the consumer's inferred warrant and the perceived comprehensiveness of the argument are the two variables of significance. Thus, in support of H2, by arguing the claimed warrant and its comprehensiveness, consumers infer the store credibility, and the more warrants they infer, the higher the store's perceived credibility.

Influence of Negative Publicity: More Inferred Warrants Lead to More Credibility Loss
TABLE 3 shows the effect of negative publicity on consumers' perceived store credibility. As shown, before consumers are given the negative information, the perceived store credibility increases with the number of inferred warrants, but afterward the value becomes random. In particular, the difference between before- and after- the negative publicity, "the after minus the before," is negative and the magnitude increases with the number of warrants that consumers infer. Therefore, in support of H3, negative information has a negative influence on the consumers' perceived store credibility, and the magnitude of this negative effect increases with the number of different product warrants claimed.

TABLE 2
THE MEDIATION OF NO. OF WARRANTS INFERRED ON THE RELATIONSHIP BETWEEN SELLER'S WARRANT CLAIM AND PERCEIVED STORE CREDIBILITY [a.]

Dependent / Independent variables	Consumers' Perceived Store Credibility		
	Model 1	Model 2	Model 3
No. warrants claimed by seller	.24***	-.04	-.07
No. warrants inferred by consumers		.37***	.21*
Perceived comprehensiveness for argument			.37***
Perceived usefulness for argument			.11
Model F-value	4.25***	4.79***	11.37***
R^2	.11	.18	.35
ΔR^2 (Compared to Model 1)	---	.07***	.24***

a. All models controlled sex, education, monthly allowance, and purchase frequency.
*** $P < 0.001$; ** $p < 0.01$; * $p < 0.05$

TABLE 3
CHANGE OF PERCEIVED STORE CREDIBILITY DUE TO NEGATIVE PUBLICITY: AFTER-BEFORE DIFFERENCE

No. warrants inferred by consumers	Perceived store credibility		
	Before the negative publicity	After the negative publicity	After-before difference
0 (N=13)	3.39	2.55	-0.84
1 (N=43)	4.31	3.21	-1.10
2 (N=60)	4.49	3.02	-1.47
3 (N=46)	4.88	3.13	-1.74
4 (N=19)	5.09	3.33	-1.76
F-value [a.]	7.48***	1.28	3.58**

a. The effects of sex, education, monthly allowance, and purchase frequency are controlled.
*** $P < 0.001$; ** $p < 0.01$

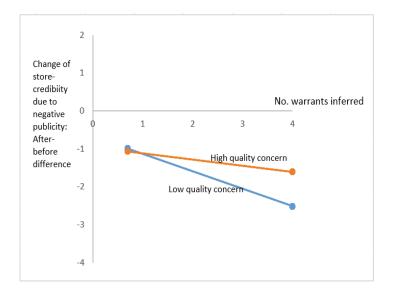**Consumers' Quality Concerns' Moderation of the Influence of Negative Publicity**

FIGURE 3 illustrates in graphical form how consumers' quality concerns affect the loss of store credibility due to negative publicity. It is drawn in line with the moderating regression model:

Loss of store credibility due to negative publicity: after-before difference = $-0.59^{***} \times$ Number of inferred product warrants $+ 0.10 \times$ High/low quality concern $+ 0.11^{+} \times$ Interaction of the two $+$ controlling of personaldata(insignificant) (2)

where $^{***}p < 0.001$, $^{+}p < 0.10$, and the effects of sex, education, monthly allowance, and tea milk purchasing frequency are controlled. The high- and low-quality concern groups are those who respectively rated above (N = 45) and below (N = 60) the medium score 3, excluding 3, of the 5-point product feature scale during daily food shopping. The significant positive correlation, $r = 0.37^{***}$, between this high/low grouping and the quality caring variable—product quality receiving the most care in shopping—verifies the appropriateness of this grouping procedure. The correlation test also shows that the high-quality concern group has a lower purchase frequency than the one of low concern ($r = -0.27^{**}$, $^{**}p < 0.01$). The consumers who are most concerned about high quality are more cautious in making purchases.

FIGURE 3 provides a visual depiction of the differences in the slope and intercept of this moderation model. It shows that, with a smaller negative slope, the high concern group accounts for less of the decrease in the store credibility. Stated another way, consumers who care less about product quality are more easily affected by negative publicity and are more likely to lower their previously good impression of a store. Thus, in support of H4, consumers' quality concerns moderate the influence of negative information, whereby a negative effect is larger with consumers who are less concerned about quality than among those who are more concerned.

FIGURE 3
THE MODERATING OF CONSUMERS' HIGH/LOW QUALITY CONCERN ON THE CHANGE OF PERCEIVED STORE CREDIBILITY DUE TO NEGATIVE PUBLICITY

DISCUSSION AND CONCLUSION

In the promotion of product quality, although the sellers initiate the signals, it is the consumers who evaluate the implications to make the final quality inference. However, in practice, people seldom use highly disciplined logic in processing information (Toulmin, 2003). Rather, they apply a range of

common sense justifications to argue the veracity of sellers' claims and decide whether they want to move to the claims based on the evidence provided. Thus far, the quality-signaling literature fails to consider this. Our findings add to the literature, through an explicit, consistent argument model, the ability to make consumers' implicit structures of practical reasoning on the simultaneous effects of multiple cues explicable for analysis.

Toulmin Model as Methodological Tool to Design Multiple Quality Signaling

Building on the literature, this study designs four product warrant scenarios, using a quality signaling model of escalating warrants. The first scenario contains only product feature information as the warrant because product information is the foundation of product quality. The second scenario increases a seller's self-supported money-back warranty. The third increases an insurance company's compensative support. The fourth increases a certification with authorization from a recognized third party. The experiment thus comprises four scenarios escalating from one to four warrants types, with each scenario randomly assigned to a group of participants for review and response. Our regression analyses show that each of these four warrants are significantly different in that each contributes significantly to the number of warrants they inferred. In other words, the types of warrant, rather than simply the total quantity, decide the simultaneous effects of multiple signaling.

However, given differences in the conceptual frameworks, these findings differ from the recent findings of Chu & Chintagunta (2011) and Fang et al. (2013) regarding the warranty as an informational signal in the automobile and electronic product markets. They find that when consumers are confident in a seller's brand, any further signaling, regardless of the type of signal added, is redundant in consumer-based quality inference. In fact, in contrast to their findings, we find that the last two warrants—an insurance company's compensation warranty and the third-party certified proof, both supported by an external institution—had a greater effect than the first two added-in, self-supported warrants, namely the product-feature statement and money-back guarantee. In particular, these contrasts, with minor deviations from the message the sellers intend to deliver, suggest that consumers do disagree on the warrant information claimed by the sellers. Further, the more warrant types they claim, the greater the amount of warrants consumers infer. Thus, in contrast to other experimented products, we attribute the distinction to our structure of signaling on Toulmin's argument patterns.

Specifically, it is consumers who evaluate sellers' quality claims along with informational cues. Berente et al. (2011) indicate that people make decisions from a smattering of perceptions, experiences, and motivations. They go further to suggest that, although this pragmatic position of reasoning allows varied forms of argument, the claim-ground-warrant model of Toulmin provides a tool whereby we could rigorously capture the implied logic without fitting the findings to preformed assumptions about human rationality. Particularly, Toulmin's model (2003) asserts that a human's argument pattern is determined by the warrant brought to bear. Built on various social theories, including information, cognition, institution, organization, and social values, Berente and colleagues indicate that the forms of sensemaking-oriented discourses match broadly with five types of warrant: causal, analogy, generalization, sign, and authority (Berente et al., 2011; Brockriede & Ehninger, 1960). Following these assumptions and characterizing different forms of warrant in a multiple quality-signaling model proves to be one of the key contributions of this study.

Influence of Negative Publicity and Consumers' Quality Concerns

The current mediation test reveals that through evaluation of the informational product warrants, consumers would go further to conclude the seller's credibility, and the connection is positive—the more warrants inferred, the higher the perceived seller credibility. However, further tests indicate that this positivity can be completely destroyed in the face of negative publicity. In light of publicized yet unverified negative information about its production process in this study, a seller's credibility was instantly reduced to an unsatisfactory level, regardless of any of the warrants. More interestingly, this reduced amount, the before- and after-publicity difference, appeared to have a significantly negative relationship with the consumers' inferred number of warrants. That is, the more warrants inferred, the larger the amount of credibility lost. Fortunately, consumers who are more concerned with quality than with price or other factors experience a smaller reduction in their perception of the seller credibility. Consumers who are more easily affected by negative information tend to care less about product quality.

Although there are differences in the subjects, our result regarding an increasing loss of credibility with the endorsed warrants, is in congruence with those of several studies (e.g., Louie & Obermiller, 2002; White et al., 2009; Thwaites et al., 2012), that note how the influence of negative information regarding an endorsement may extend to the endorsed product or brand. Above all, a small amount of negative publicity can reduce the public's perception, and the more warrants, the larger the negativity. The underlying consideration is that making a claim does not stop after the claim, but rather serves as a beginning to produce better products. A seller should carefully manage its claims of warrant, and should especially ensure that the claim will not go against any quality that is essential in the actual production process, such as the use of low-cost material against a claim of natural ingredients, or a dishonest description of product features against a claim of third-party certification. We also propose that sellers can argue, as a consumer, to see how the potential consumers might reflect upon their claims.

Limitations

We conclude this study by explaining several limitations and possible directions for feature research. First, although Toulmin' argumentation theory provides us clear guidance in building the seller-claim- warrant—consumer-reason-inference relationship model for analysis of the unseen conversation between sellers and consumers, the experiment is not without difficulty. Specifically, the means to objectively discern the elements of data, warrant, and backing, and whether the results thus derived are reliable, require further confirmation. For instance, we had difficulty discerning the boundary of a seller's money-back guarantee and the compensated amount of an insurance company in developing the escalating warrants. The clarification between the roles of insurance and certification was also an issue in the composition. Primarily, if based on a financial expenditure point of view, both insurance and certification are dissipative signals because their investments are made up front to meet certain accredited standards (Rao, Qu and Ruekert, 1999). However, if based on a marketing perspective, in which consumers may be motivated to avoid losses or to seek gains, then insurance illustrates a focus on prevention, and certification a focus on promotion (Chatterjee, Kand &Mishra, 2005). Currently, we define them as two equal warrants of different definitions—institutional (insurance) and authorized sign (certification), respectively—based on the argument warrant theory (Brockriede & Ehninger, 1960; Berente et al., 2011). Our findings confirm the equal significance of these two warrants in a multiple product-signaling model. Our purpose herein is not to compare the various theories, but to serve as a reminder of the caution required in the experiment of these theories.

Second, this study only examines the inferences of potential consumers on seller's claims of warrant, without checking further how and why there were deviations between their arguments and the scenarios delivered by the sellers. Although these minor discrepancies could attribute to the natural biases or anticipated rebuttals of a practical argument (Toulmin, 2003), future research would need to dissect the relative reasons at varying warrant levels. The use of a series of focus groups or in-depth interviews may allow a deeper understanding of exactly how and why the inferences are different in the same scenario.

Third, we also need to urge caution in interpreting the findings of increasing negative influence due to negative publicity because pretest-posttest research designs are often difficult to explain, and one can never be certain whether the differences are due to the independent variables measured or a lack of reliability in the measures (Thwaites et al., 2012). Moreover, the warrant is not self-validating. The use of alternative age groups would allow a comparison to uncover specific differences in attitudes across generations regarding different personal characteristics, which may provide an improved validity check for the data. Fourth, our experiment was carried out over a relatively short timeline, which may make the influence of negative publicity more apparent than in real life, even though we requested that "no retrospect" be considered in the experiment. A firm's reputation concerns the evolution of the firm's consistent communicating actions with its target consumers about its product quality and service over time (e.g., Nguyen &Leblanc, 2001). A longitudinal study over a period of time may be able to adjust the potential biases.

REFERENCES

Ahluwalia, R. (2002). How prevalent is the negativity effect in consumer environments? *Journal of Consumer Research*, 29, 270-279.

Akdeniz, M.B, Calantone, R. J. & Voorhees, C. M. (2012). Effectiveness of marketing cues on consumer perceptions of quality: The moderating roles of brand reputation and third-party information. *Psychology and Marketing*, 30, (1), 76-89.

Akerlof, G. (1970). The market for lemons: quality and the market mechanism. *Quarterly Journal of Economics*, 84, (3), 488-500.

Bagwell, K. & Riordan, M. (1991). High and declining prices signal product quality. *The American Economic Review*, 81, (1), 224-239.

Bailey, E. & Pearson, W. (1983). Development of a tool for measuring and analyzing computer user satisfaction. *Management Science,* 29, (5), 530-545.

Baron, R. M. & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, (6), 1173-1182.

Berente, N., Hansen, S., Pike, J.C. & Bateman, P. J. (2011). Arguing the value of virtual words: Patterns of discursive sensemaking of an innovative technology. *MIS Quarterly*, 35, (3), 685-709.

Bond, J. & Kirshenbaum, R. (1998). *Under the radar: Talking to today's cynical consumer*, New York: John Wiley & Sons.

Boulding, W. & Kirmani, A. (1993). A consumer-side experimental examination of signaling theory: Do consumers perceive warranties as signals of quality? *Journal of Consumer Research*, 20, 111-123.

Brockriede, W. & Ehninger, D. (1960). Toulmin on argument: An interpretation and application. *Quarterly Journal of Speech*, 46, 44-53.

Cacioppo, J.T. & Petty, R.E. (1982). The need for cognition. *Journal of Personnel Social Psychology*, 42, January, 116-131.

Chatterjee, S., Kand, Y.S. & Mishra, D.P. (2005). Market signals and relative preference: The moderating effects of conflicting information, decision focus, and need for cognition. *Journal of Business Research*, 58, 1362-1370.

Chu, J. & Chintagunta, P. (2011). An empirical test of warranty theories in the US computer server and automobile markets. *Journal of Consumer Psychology*, 7, (2), 131-158.

Clark, D.B. & Sampson, V. (2007). Personally-seeded discussions to scafford online argumentation. *International Journal of Science Education*, 29, (3), 253-277.

Coombs, W. T. & Holladay, S. J. (2007). The negative communication dynamic: Exploring the impact of stakeholder affect on behavioral intentions. *Journal of Communication Management*. 11, (4), 300-312.

Dean, D. H. (2004). Consumer reaction to negative publicity: Effects of corporate reputation, response, and responsibility for a crisis event. *Journal of Business Communication*, 41, (2), 192-211.

Decker, W. H. (2012). A firm's image following alleged wrongdoing: Effects of the firm's prior reputation and response to the allegation. *Corporate Reputation Review*, 15, (1), 20-34.

Dennis, E. E. & Merrill, J. C. (1996). *Media debates: Issues in mass communication*, White Plains, NY: Longman.

Dewally, M. & Ederington, L. (2006). Reputation, certification, warranties, and information as remedies for seller-buyer information asymmetries: Lessons from the online comic book market. *Journal of Business*, 79, (2), 693-729.

Erdem, T. & Swait, J. (1998). Brand equity as a signaling phenomenon. *Journal of Consumer Psychology*, 7, (2), 131-158.

Erduran, S., Osborne, J. & Simon, S. (2005). The role of argumentation in developing scientific literacy. In K. Boersma, M. Goedhart, O. de Jong, and H. Eijkelhof (Eds.), *Research and the quality of science education* (pp. 381-394). Dordrecht, Germany: Springer.

Fairclough, N. (2003). *Analyzing Discourse: Textual Analysis for Social Research*, London: Routledge.

Fang, X., Gammoh, B. S. & Voss, K.E. (2013). Building brands through brand alliances: Combining warranty information with a brand ally. *Journal of Product & Brand Management*, 22/2, 153-160.

Green, S.E., Li, Y. & Nohria, N. (2009). Suspended in self-spun webs of significance: A rhetorical model of institutionalization and institutionally embedded agency. *Academy of Management Journal*, 52, (1), 11-36.

Herr, P. M., Kardes, F. R. & Kim, J. (1991). Effects of word-of-mouth and product-attribute information on persuasion: An accessibility-diagnosticity perspective. *Journal of Consumer Research*, 17, 454-462.

Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychology*, 52, December, 1280-1300.

Jimenez-Alexiandre, M.P., Rodriguez, M. & Duschl, R.A. (2000). Knowledge producers or knowledge consumers? Argumentation and decision making about environmental management. *International Journal of Science Education*, 24, (11), 1171-1190.

Kensinger, E. A. & Corkin, S. (2003). Effects of negative emotional content on working memory and long-term memory. *Emotion*, 3, 378-393.

Kihlstrom R. E. & Riordan, M. (1984). Advertising as a signal. *Journal of Political Economics*, 92, June, 427-450.

Kim, J. Yoon, H. J. & Lee, S. Y. (2010). Integrating advertising and publicity. *Journal of Advertising*, 39, (1), 97-113.

Kirmani, A. & Rao, A. R. (2000). No pain, no gain: A critical review of the literature on signaling unobservable product quality. *Journal of Marking*, 64, 66-79.

Laufer, D. & Coombs, W. T. (2006). How should a company respond to a product harm crisis? The role of corporate reputation and consumer-based cues. *Business Horizons*, 49, (5), 379-385

Louie, T. A. & Obermiller, C. (2002). Consumer response to a firm's endorser (dis)association decision. *Journal of Advertising*, 31, 41-54.

Maheswaran, D. & Meyers-Levy, J. (1990). The influence of message framing and issue involvement. *Journal of Marketing Research*, 27, August, 361-367.

Mizerski, R. W. (1982). An attribution explanation of the disproportionate influence of unfavorable information. *Journal of Consumer Research*, 9, 301-310.

Newell S. J. & Goldsmith, R. E (2001). The development of a scale to measure perceived corporate credibility. *Journal of Business Research,* 52, 235-247

Nguyen, N. & Leblanc, G. (2001). Corporate image and corporate reputation in customers' retention decisions in services. *Journal of Retailing and Consumer Services*, 8, (4), 227-236.

Rao, A.R., Qu, L. & Ruekert, R.W. (1999). Signaling unobservable product quality through a brand ally. *Journal of Marketing Research*, 36, May, 258-268.

Savolainen, R. (2012). The structure of argument patterns on a social Q&A site. *Journal of the American Society for Information Science and Technology*, 63, (12), 2536-2548.

Schmidt, D. P. (1986). Patterns of argument in business ethics. *Journal of Business Ethics*, 5, 501-509.

Sussman, S. W. & Siegal, W. S. (2003). Informational influence in organizations: An integrated approach to knowledge adoption. *Information Systems Research*, 14, 47-65.

Siomkos, G. J. & Kurzbard, G. (1994). The hidden crisis in product-harm crisis management. *European Journal of Marketing*, 28, (2), 30 - 41.

Spence, M. (1974). Job market signaling. *Quarterly Journal of Economics*, 87, (3), 355-374.

Thwaites, D., Lowe, B., Monkhouse, L. L. & Barnes, B. R. (2012). The impact of negative publicity on celebrity ad endorsements. *Psychology & Marketing*, 29, (9), 663-673.

Toulmin, S. E. (2003). *The use of argument,* Cambridge, UK: Cambridge University Press.

Vanhamme J. & Grobben, B. (2009). "Too good to be true!". The effectiveness of CSR history in countering negative publicity. *Journal of Business Ethics*, 85, 273-283

White, D. W., Goddard, L. & Wilbur, N. (2009). The effect of negative information transference in the celebrity endorsement relationship. *International Journal of Retail & Distribution Management*, 37, 322-335.

Whithaus, D. (2012). Claim-evidence structures in environmental science writing: Modifying Toulmin's model to account for multimodel arguments. *Technical Communication Quarterly*, 21, 105-128.

Wiener, J. L. (1985). Are warranties accurate signals of product reliability? *Journal of Consumer Research*, 12, (2), 245-250.