Communicating Market Scarcity: The Role of Information Congruity in Shaping the Persuasiveness of Time Restriction

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Abstract

This study is part of a research program investigating the persuasive effect of market scarcity. In the experiment reported here, the impact of market scarcity, operationalized as time restriction, on information processing and product evaluation was examined at different levels of product message and task importance. The results rejected a personal-involvement perspective to scarcity but supported an information congruity theory. It was the incongruity between the value inferred from scarcity cue and the worth derived from product message, especially under low task importance, that led to extensive processing of product message and attenuated the persuasive effect of scarcity cue. This research indicated the importance of incorporating congruity into persuasion research and marketing communication for better understanding and implementation of scarcity appeals.

Key Words: market scarcity, time restriction, information congruity, persuasion

1. Introduction

Market scarcity, such as imposing time restriction (e.g., today only) on a product, is widely used in retail advertisements (Howard & Kerin, 2006). A leading view regarding the effect of scarcity appeals focuses on the heuristic implications of scarcity, arguing that it signals expressive benefits such as uniqueness (Snyder & Fromkin, 1980) and more importantly instrumental values such as quality (Wu & Hsing, 2006). As would be predicted by contemporary persuasion theories such as the elaboration likelihood model (ELM) (Petty & Cacioppo, 1986) or the heuristic-systematic model (HSM) (Chaiken, 1987), high scarcity should lead to higher purchase likelihood than low scarcity when a consumer is not motivated to process additional product information (Lynn, 1992).

Nevertheless, other researchers contend that a product does not necessarily become more appealing under high restriction conditions than under low restriction conditions. A recent study indicated that an "available-today-only" high time restriction led to more sales of a cinnamon twist, a fast food item generally of low customer interest, than an "available-all-year" low time restriction when the product information was strong, but the high restriction resulted in less sales than the low restriction when the information was weak (Brannon & Brock, 2001). This significant strong-weak message differentiation effect at the high restriction level suggests that scarcity may actually function like personal involvement, and high scarcity, similar to high personal involvement, motivates consumers to scrutinize product information and make decisions based on the true merits of the product especially when they are initially not motivated to process the product information (Brannon & Brock, 2001).

However, this personal involvement approach still cannot fully account for the impact of scarcity on purchase behavior. For example, consumers in real life enjoy an abundance of choices, so limiting their access to one particular product is more likely to encourage product switching rather than inducing a strong motivation to know more about the scare product (Gierl, Plantsch, & Schweidler, 2008). Furthermore, this approach does not explain why scarcity would lose its information value as a heuristic cue. Given the prevalence of scarcity-based decision-making in daily life (Cialdini, 2001), it seems quite unlikely that the respondents, who were lowly involved with the subject matter in the fast-food study (Brannon & Brock, 2001), did not use the scarcity information to make inferences about the quality of the cinnamon twist when considering purchasing the food item. An information congruity theory (Chaiken, Liberman, & Eagly, 1989), developed from the HSM, provides a promising alternative perspective to the persuasive effect of market scarcity.

According to this theory, message recipients, especially those who are initially lowly involved with an information processing task, will be motivated to scrutinize the message content of a persuasive communication if there is clear contradiction between the heuristic cue and message content in the communication. Arguably, the high restriction decreased sales when paired with the weak message (Brannon & Brock, 2001) because good quality of the cinnamon twist inferred from the restriction was disconfirmed by the subsequent weak message about the food item. The incongruity discredited the information value of the restriction cue and prompted the consumers to scrutinize the message content, which substantially decreased favorability toward the food item. The high restriction increased sales when paired with the strong message because the inferred good quality from the restriction cue was congruous with the strong message, and both of them should increase the purchase of the food item.

This article attempted to empirically test the validity of applying the information congruity theory to market scarcity research. Time restriction, the most frequently used scarcity appeal in print advertisements (Howard & Kerin, 2006), was the market scarcity in this study. The remainder of the article includes a literature review of both the information congruity theory and the personal involvement perspective to market scarcity, an experiment that tested competing hypotheses regarding the persuasive effect of market scarcity, and a discussion about the theoretical and managerial implications of this study.

2. Literature Review and Hypotheses

2.1. Information Congruity

The information congruity theory is built upon two unique assumptions of the HSM. One is co-occurrence of heuristic and systematic processing when a persuasive communication contains both heuristic cue and message content, and the other is a sufficiency principle of attitudinal judgment (Chaiken, et al., 1989). According to the co-occurrence perspective, minimal amount of systematic processing still exists even when message recipients are lowly involved with an information processing task and primarily engage in heuristic processing. This minimal processing is best described as encoding message content into a general impression as positive or negative (Bless, Mackie, & Schwarz, 1992). Similarly, heuristic cue is still considered even when message recipients engage in systematic processing. According to the sufficiency principle, message recipients will primarily rely on the less effortful and more efficient heuristic processing if this mode renders sufficient judgment confidence, but they will be motivated to engage in greater amount of systematic processing if heuristic processing does not provide sufficient judgment confidence. One of the circumstances under which message recipients step up systematic processing is when they receive conflicting information from heuristic cue and message content.

A typical HSM or ELM study features a factorial experiment with two levels of message content (i.e., strong vs. weak arguments) and two levels of a heuristic cue such as expertise (i.e., expert vs. non-expert), and this design inadvertently introduces an additional manipulation of information congruity (Chaiken, et al., 1989). In two of the four cells, message content and heuristic cue complement each other when, for example, an expert/non-expert delivers strong/weak arguments. Nevertheless, in the other two cells, the two factors contradict each other when an expert/non-expert delivers weak/strong arguments. From an information expectancy perspective (Maheswaran & Chaiken, 1991), heuristic cue, which is often given prior to message content in HSM/ELM studies, establishes expectancies about message validity. Subsequent message content may either maintain these expectancies if the value inferred from the heuristic cue is confirmed by the worth derived from the message content, or violate these expectancies if the value from the heuristic cue is disconfirmed by the worth from the message content (Maheswaran & Chaiken, 1991).

Drawing on the finding that expectancy-incongruent information is better processed and recalled than expectancy-congruent information (Stern, Marrs, Millar, & Cole, 1984), researchers argue that conflicting information from heuristic cue and message content should have a substantial influence on motivation of information processing particularly under low personal involvement or task importance conditions (Maheswaran & Chaiken, 1991). Respondents in these conditions would feel it highly insufficient to continue relying on the heuristic cue after it is discredited by the message content, and they should be motivated to deeply process the information in the message content for better attitudinal judgment. In the experiment reported below, respondents received both scarcity information that indicated high or low time restriction on a new soft drink and a product message that described the soft drink in strong or weak terms.

Because higher restriction implies better product (Lynn, 1992), incongruity was likely to occur under high restriction/weak message and low restriction/strong message conditions, and congruity was likely to happen under high restriction/strong message and low restriction/weak message conditions. The major prediction was that incongruity would enhance systematic processing among the respondents who were led to believe that their information processing task and judgments were unimportant. The respondents' heuristic processing of high/low restriction should produce positive/negative evaluation of the soft drink brand. In the congruity condition, minimal systematic processing would confirm the heuristic-based evaluations, so there would be little incentive for these respondents to engage in further systematic processing and their product evaluation would be ultimately determined by the heuristic inference of the restriction. In the incongruity condition, however, the minimal processing of the message would undermine respondents' confidence in their heuristic-based judgments. To attain sufficient confidence, these respondents would increase their systematic-processing efforts and eventually evaluate the product according to its true merits described in the message. It was therefore proposed:

H1: Low-task-importance respondents would exhibit less confidence in product evaluation under the incongruity condition than under the congruity condition.
H2: Low-task-importance respondents would exhibit more extensive cognitive processing of message content under the incongruity condition than under the congruity condition.
H3: Low-task-importance respondents would exhibit more reliance on message content but less reliance on restriction in product evaluation under the incongruity condition than under the congruity condition.

While half of the respondents were told that their information processing task and judgments were unimportant, another half of the respondents were informed that their information processing task and judgments were important. Theoretically speaking, incongruity would further enhance systematic processing among the high-task-importance respondents, but this effect might be largely undetectable due to an overall high rate of systematic processing among these respondents (Maheswaran & Chaiken, 1991). It was therefore proposed:

H4: High-task-importance respondents would exhibit extensive cognitive processing of message content, and the level of processing would be the same between the congruity and incongruity conditions.

Low-task-importance respondents might follow the sufficiency principle of attitudinal judgment and choose to deeply process message content when losing confidence in the accuracy of their heuristic-based judgments, but high-task-importance respondents did not have to make a choice between sufficiency and accuracy and would be motivated to process both message content and heuristic cue. Under the high-importance incongruity condition, any persuasive impact of the restriction cue would be attenuated by its conflict with the product message, and only the product message would have a main effect on attitudinal judgment. Nevertheless, it has also been observed that under the high-importance congruity condition, both heuristic cue and message content exerted a significant impact on attitudinal judgment (Maheswaran & Chaiken, 1991). It was therefore proposed:

H5: High-task-importance respondents would exhibit more reliance on message content than restriction in product evaluation under the incongruity condition, but they would exhibit reliance on both message content and restriction in product evaluation under the congruity condition.

2.2. Personal Involvement Perspective to Market Scarcity

The idea that market scarcity may increase personal involvement in information processing stems from a "liberalizing" revision of commodity theory. According to the original commodity theory, when a persuasive message, i.e., the commodity, is subject to scarcity, which refers to restricted access to the message, it will be valued to a greater extent, resulting in greater persuasion toward the position advocated in the message (Brock, 1968). Commodity theory therefore clearly presents a "silver bullet" or heuristic cue view of scarcity (Bozzolo & Brock, 1992). Nevertheless, the "liberalizing" revision of commodity theory, through its integration with the ELM, abandons the heuristic cue approach but proposes an elaborative account. Specifically, the new version posits that restricted access to a message can effectively increase personal involvement with the message particularly among those whose involvement is initially low, and this increased personal involvement in turn enhances the motivation to process the message, resulting in greater persuasion toward the position in the message if the message is strong than if the message is weak (Bozzolo & Brock, 1992). There is indeed empirical evidence that supports the liberalized commodity theory.

In an experiment modified from the classic senior comprehensive exams study (Petty, Cacioppo, & Goldman, 1981), low-involvement respondents did exhibit deeper cognitive processing when they were told that the message about the exams was confidential and unavailable to the public than when they were told that the message was available to the general public, and their attitudes toward the exams did indicate a more pronounced strong versus weak message differentiation effect under the confidential condition than under the available condition (Bozzolo & Brock, 1992). The above-mentioned cinnamon twist study reported the same message strength differentiation effect when the supply of the cinnamon twist was subject to scarcity, and this seemed to suggest that the liberalized commodity theory, although originally a theory of message scarcity, was well applicable to market scarcity (Brannon & Brock, 2001). However, it should be noted that the manipulations of the two types of scarcity differed from each other substantially. In the senior comprehensive exams study, it was the message about the exams rather than the exams per se that was subject to scarcity. By sharp contrast, in the cinnamon twist study, it was the cinnamon twist rather than the message about the cinnamon twist that was subject to scarcity. More importantly, the extent of cognitive processing was not directly measured but inferred from the differences in sales across experimental conditions in the cinnamon twist study. These issues make it questionable to apply the liberalized commodity theory to market scarcity. It could be flawed to think that all types of scarcity universally enhance personal involvement that is initially low and increase the depth of cognitive processing. To directly assess the validity of the personal involvement perspective to market scarcity, it was hypothesized:

H6: Low-task-importance respondents would exhibit more extensive cognitive processing of message content under the high restriction condition than under the low restriction condition.

3. Method

3.1. Experimental Design

A 2 (task importance: high or low) × 2 (time restriction: high or low) × 2 (message content: strong or weak) factorial between-subjects design was used to test the proposed hypotheses. A total of 240 male and female undergraduate students participated in the experiment, and they were randomly assigned to one of the eight conditions. The respondents learned that the study was about their opinions on a new soft drink brand known as Sunblast. Half of the respondents were told that their opinions were unimportant whereas another half of the respondents were told that their opinions were important. Next, the respondents received one print advertisement of Sunblast, which was adopted from a previous information processing study (Mano, 1997). A "one week only" or "six months only" time restriction was added at the top of the advertisement (See Appendix 1 for more details). After viewing the print advertisement, the respondents were instructed to complete a questionnaire that assessed dependent measures similar to those in the original information congruity study (Maheswaran & Chaiken, 1991).

3.2. Independent Variables

3.2.1. Task Importance. Low-task-importance respondents were told that the manufacturer was surveying large samples of consumers for opinions and their individual opinions were unimportant because they would be averaged with those of many others; whereas high-task-importance respondents were told that the manufacturer was surveying small samples of consumers to decide whether to distribute the product on the local market and their individual opinions would weigh heavily in this decision (Maheswaran & Chaiken, 1991).

3.2.2. Time Restriction. Prior to the experiment reported below, a pretest was conducted to ask 40 participants how short/long it would take to make them think that a time restriction was really/not really a restriction. A majority (53%) of the respondents reported that one-week-only was really a time restriction, and a plurality (36%) of the respondents indicated that they felt little restriction if the length was six-month-long and above. As a result, high restriction was set at one-week-only, and low restriction was set at six-month-only.

3.2.3. Message Content. The strong message was composed of favorable product attributes such as low calories, more natural ingredients, and strong blind taste test results; whereas the weak message was composed of less favorable product attributes such as high calories, fewer natural ingredients, and weak blind taste test results (See Appendix 1 for more details).

3.2.4. Information Congruity. The congruity manipulation was jointly created by the time restriction and message content manipulations. In the congruity condition, respondents were exposed to high time restriction and strong product message or low time restriction and weak product message.

In the incongruity condition, respondents were exposed to high time restriction and weak product message or low time restriction and strong product message.

3.3. Dependent Variables

3.3.1. Manipulation Checks. The task-importance manipulation was assessed by asking respondents to indicate their motivation to read the product message on two 9-point (-4 to 4) scales (not interested — highly interested, not involved — highly involved) (Maheswaran & Chaiken, 1991). Responses were averaged to form a task importance index (α = .82). The time restriction manipulation was checked by having respondents rate the perceived availability of the product on one 10-point scale ranging from 1 (very unavailable) to 10 (very available) (Brannon & Brock, 2001). The message content manipulation was assessed by asking respondents to indicate their perception of the product message on five 5-point (1 to 5) bipolar scales (very uninformative — very informative, very unbelievable — very believable, very uninteresting — very interesting, very unpersuasive — very persuasive, and very weak — very strong) (Mano, 1997). Responses were averaged to form a message content perception index (α = .86).

3.3.2. Cognitive Processing. Respondents were asked to list their thoughts in response to the print advertisement, and then asked to code their thoughts as product attribute related or time restriction related (A, R) and as expressing positive, negative, or neutral evaluation toward the brand (+, -, 0). The valence of attribute-related thinking (A+ - A- thoughts) and the valence of restriction-related thinking (R+ - R- thoughts) were used as supplementary checks on message content and time restrictions manipulations, respectively (Maheswaran & Chaiken, 1991). Two independent coders, unaware of the purpose of the study, judged whether the respondents' thoughts were discrepancy-related or not, and this was intended as a manipulation check of information congruity (Maheswaran & Chaiken, 1991). Inter-coder agreement achieved 96%, and disagreements were resolved through discussion.

3.3.3. Evaluation Confidence. Respondents were asked to rate how certain they were in their evaluation of Sunblast on one 9-point scale (-4 to 4) (Maheswaran & Chaiken, 1991).

3.3.4. Product Evaluation. Respondents indicated the extent to which they would consider buying Sunblast, their favorability toward Sunblast, and the extent to which they regarded the product as useful and as good on four 9-point scales (-4 to 4) (Maheswaran & Chaiken, 1991). Responses were averaged to form a product evaluation index (α = .90).

4. Results

Unless otherwise stated, the data were processed with three-way Task Importance × Time Restriction × Message Content analyses of variance (ANOVAs). Gender difference was not detected in preliminary analyses.

4.1. Manipulation Checks

4.1.1. Task Importance. The ANOVA yielded a task-importance main effect on the two-item task-importance index. Respondents in the high importance condition were more motivated to read the product attributes than those in the low importance condition (M_{high} = 2.92 vs. M_{low} = 0.10; $F(1, 232) = 302.46$, $p < .001$). The task importance manipulation was successful.

4.1.2. Time Restriction. The ANOVA yielded a time-restriction main effect on the perceived availability. Respondents in the high restriction condition rated Sunblast as less available than those in the low restriction condition (M_{high} = 4.48 vs. M_{low} = 6.87; $F(1, 232) = 48.30$, $p < .001$). In addition, the valence of respondents' restriction-related thoughts was more favorable toward Sunblast when the restriction was high than when it was low (M_{high} = .17 vs. M_{low} = -.07; $F(1, 232) = 4.44$, $p < .05$). The time restriction manipulation was successful.

4.1.3. Message Content. The ANOVA yielded a message-content main effect on the five-item message-perception index. Respondents in the strong message condition rated the message as stronger than those in the weak message condition (M_{strong} = 3.77 vs. M_{weak} = 1.84; $F(1, 232) = 491.98$, $p < .001$). In addition, the valence of respondents' attribute-related thoughts was more favorable toward Sunblast when the message was strong than when it was weak (M_{strong} = 1.06 vs. M_{weak} = .15; $F(1, 232) = 14.55$, $p < .001$). The message content manipulation was successful.

4.1.4. Congruity Perception. The ANOVA yielded a time restriction by message content interaction effect on the number of discrepancy-related thoughts that participants listed, ($F(1, 232) = 36.21$, $p < .001$).

It was not surprising that only the interaction effect was detected because the congruity variable was jointed created by time restriction and message content. As evidenced in a follow-up congruity-based *t*-test, respondents listed more discrepancy-related thoughts when time restriction and message content were incongruent than when they were congruent ($M_{incongruent}$ = .46 vs. $M_{congruent}$ = .03; $t(1, 238) = 6.09$, $p < .001$). In other words, the information congruity manipulation was successful.

4.2. Evaluation Confidence

The ANOVA yielded a time restriction by message content interaction effect on evaluation confidence, ($F(1, 232) = 105.06$, $p < .001$). As stated above, the manipulations of time restriction and message content jointly created information congruity, and the interaction suggested a significant relationship between information congruity and evaluation confidence. A congruity-based *t*-test indicated that respondents in the incongruity condition indicated less confidence in their product evaluation than those in the congruity condition ($M_{incongruent}$ = .95 vs. $M_{congruent}$ = 2.58; $t(1, 238) = -10.22$, $p < .001$), and the results supported Hypothesis 1.

4.3. Cognitive Processing

The ANOVA yielded a task-importance main effect on both restriction-related and attribute-related thoughts, respectively. Respondents in the high importance condition listed fewer restriction-related thoughts than those in the low importance condition (M_{high} = 1.04 vs. M_{low} = 1.28; $F(1, 232) = 4.45$, $p < .05$), but they listed more attribute-related thoughts than their counterparts in the low importance condition (M_{high} = 2.55 vs. M_{low} = 2.27; $F(1, 232) = 4.37$, $p < .05$). The evidence indicated that the task-importance manipulation exerted its expected effect on cognitive processing. The ANOVA also yielded a time restriction by message content interaction effect ($F(1, 232) = 4.90$, $p < .05$). As stated above, the interaction suggested a significant relationship between information congruity and attribute-related thoughts, and this was confirmed in a congruity-based *t*-test ($M_{incongruent}$ = 2.56 vs. $M_{congruent}$ = 2.26; $t(1, 238) = 2.13$, $p < .05$).

More importantly, the ANOVA yielded a task importance by time restriction by message content interaction effect on attribute-related thoughts ($F(1, 232) = 15.49$, $p < .001$). Table 1 reported the means of attribute-related thoughts in the eight cells of the three-way ANOVA. A visual inspection of the values suggested that the impact of congruity on cognitive processing was more evident under the low task importance condition than under the high task importance condition. Two separate congruity-based *t*-tests were conducted for each of the two importance conditions, and it was confirmed that the effect of congruity was more pronounced under the low importance condition ($M_{incongruent}$ = 2.68 vs. $M_{congruent}$ = 1.85; $t(118) = 4.59$, $p < .001$) than under the high importance condition ($M_{incongruent}$ = 2.43 vs. $M_{congruent}$ = 2.67; $t(118) = -1.16$, $p = .25$). The significant difference between the two levels of congruity under the low importance condition supported Hypothesis 2, and the insignificant difference between the two levels of congruity under the high importance condition supported Hypothesis 4.

Table 1: Major Dependent Measures as a Function of Task Importance, Time Restriction and Message Content

	High task importance			
	High Restriction		Low Restriction	
Dependent Measures	Strong Message	Weak Message	Strong Message	Weak Message
Attribute-Related Thoughts	2.73 (1.36)	2.57 (1.04)	2.30 (1.02)	2.60 (.97)
Product Evaluation	2.07 (.85)	-.12 (.89)	2.03 (1.88)	-.38 (.85)
	Low task importance			
	High Restriction		Low Restriction	
Dependent Measures	Strong Message	Weak Message	Strong Message	Weak Message
Attribute-Related Thoughts	1.83 (.99)	2.43 (1.14)	2.93 (.91)	1.87 (.90)
Product Evaluation	1.73 (.80)	.53 (.82)	.79 (1.03)	.88 (1.07)

Note: Standard deviations are reported in parentheses.

On the other hand, the ANOVA did not yield a time-restriction main effect on attribute-related thoughts (M_{high} = 2.39 vs. M_{low} = 2.43; $F(1, 232) = .06$, $p = .81$). Two separate two-way Time Restriction × Message Content ANOVAs were conducted for each of the two importance conditions, but the tests did not indicated any main effect of restriction on attribute-related thoughts either under the low importance condition (M_{high} = 2.13 vs. M_{low} = 2.40; $F(1, 116) = 2.19$, $p = .14$) or under the high importance condition (M_{high} = 2.65 vs. M_{low} = 2.45; $F(1, 116) = .98$, $p = .33$). The results, therefore, rejected Hypothesis 6 that predicted the enhancement function of high restriction on cognitive processing under low importance from the personal involvement perspective of scarcity.

4.4. Product Evaluation

The ANOVA yielded a message-content main effect on product evaluation, and respondents in the strong message condition reported more favorable product evaluation than those in the weak message condition (M_{strong} = 1.65 vs. M_{weak} = .23; $F(1, 232) = 105.27$, $p < .001$). This main effect was qualified by a two-way interaction between message content and task importance ($F(1, 232) = 39.31$, $p < .001$) and a three-way interaction between message content, time restriction, and task importance ($F(1, 232) = 7.29$, $p < .01$) .

Two separate two-way Time Restriction × Message Content ANOVAs were conducted for each of the two importance conditions. The ANOVA under the high importance condition yielded a message-content main effect on product evaluation (M_{strong} = 2.05 vs. M_{weak} = -.25; $F(1, 116) = 110.24$, $p < .001$). The ANOVA under the low importance condition also yielded a message-content main effect of product evaluation (M_{strong} = 1.26 vs. M_{weak} = .70; $F(1, 116) = 10.47$, $p < .01$), but the effect size was smaller than that under the high importance condition. Alternatively speaking, message content had a stronger differentiation effect on product evaluation under the high importance condition than under the low importance condition.

In addition, there was a significant time restriction by message content interaction effect on product evaluation under the low importance condition ($F(1, 116) = 13.85$, $p < .001$). As shown in Table 1, the strong-weak message differentiation effect on product evaluation under the low importance condition was much more salient in the high restriction cells than in the low restriction cells. Although the pattern was identical to that in the previous study (Brannon & Brock, 2001), the rejection of Hypothesis 6 regarding the personal involvement perspective of scarcity meant that the message differentiation effect on product evaluation under low importance was not caused by enhanced cognitive processing of message content due to time restriction, but the congruity/incongruity between message content and time restriction.

Nevertheless, a direct test on how message content and time restriction influenced product evaluation under congruity/incongruity, as proposed in Hypotheses 3 and 5, could not be performed with the three-way Task Importance × Time Restriction × Message Content ANOVA. The reason was simple: The congruity/incongruity conditions were jointly created by time restriction and message content manipulations, and time restriction and message content were therefore perfectly confounded within the two levels of congruity (i.e., high-strong or low-weak in the congruent condition and high-weak or low-strong in the incongruent condition).

A regression method has been proposed to avoid such a confounding problem in testing the impact of heuristic cue and message content on product evaluation under congruity/incongruity conditions. Specifically, manipulation checks of heuristic cue and message content are treated as proxy terms of heuristic cue and message content, and product evaluation is regressed on the proxy terms under congruity/incongruity conditions (Maheswaran & Chaiken, 1991). The same approach was employed in this study.

4.5. Regression

As explained above, the independent variables in the regression analyses were two proxy terms of time restriction and message content, respectively, and the regression was conducted across both the congruity and importance conditions. Because perceived availability as well as valence of restriction-related thoughts was used to check the manipulation of time restriction, they were viewed as proxy terms of time restriction. For the same reason, both perception of message content and valence of attribute-related thoughts were regarded at proxy terms of message content. Nevertheless, perceived availability was determined to be the proxy term for time restriction and valence of attribute-related thoughts to be the proxy term for message content because they were not significantly correlated with each other across the congruity and importance conditions (r = -.07 for the congruity and low importance condition; r = -.04 for the incongruity and low importance condition; r = -.14 for the congruity and high importance condition; r = .07 for the incongruity and high importance condition).

The results of the low-importance regression analyses indicated that perceived availability was a significant predictor of product evaluation under the information congruity condition (b = -.43, p < .001), but its impact was insignificant under the information incongruity condition (b = .16, p = .20). On the other hand, valence of attribute-related thoughts was a significant predictor of product evaluation under the information incongruity condition (b = .41, p < .01), but its impact was insignificant under the information congruity condition (b = .07, p = .57). Hypothesis 3 was supported.

The results of the high-importance regression analyses indicated that both perceived availability (b = -.36, p < .01) and valence of attribute-related thoughts (b = .45, p < .001) were significant predictors of product evaluation under the information congruity condition, but the impact of perceived availability was insignificant (b = .06, p = .62) whereas valence of attribute-related thoughts remained significant (b = .53, p < .001) under the information incongruity condition. Hypothesis 5 was supported.

5. Discussion

5.1. Summary

Contrary to the proposition that market scarcity influences motivation of information processing in a way similar to personal involvement (Brannon & Brock, 2001), the experiment reported here indicated that market scarcity, in the form of time restriction, had no impact on the motivation in question. The results in fact strongly supported an information congruity theory of market scarcity. In addition, the restriction did serve as a heuristic cue as evidenced by the significant regression coefficient of time restriction under the information congruity and low importance condition, and the negative sign of the coefficient confirmed their informational function as to signal higher value through lower availability. These findings have significant theoretical and managerial implications.

5.2. Theoretical Implications

It is often assumed that message recipients in the low importance/involvement condition have little motivation to systematically process message content and primarily rely on values readily inferred from heuristic cues when forming attitudes. But this assumption fails to explain why some message recipients in this condition appear to actively process message content in making their attitudinal evaluation. Researchers therefore argue that some long considered heuristic cues, such as market scarcity, can actually increase motivation of information processing like personal involvement and lead to message content-based judgment (Brannon & Brock, 2001), but this perspective creates another conceptual question as to why the heuristic cues are not heuristic in nature any more.

These puzzles are now well solved by the information congruity theory. First, it is inaccurate to assume that low importance/involvement always lead to low motivation of information processing and dependence on heuristic cues. Pairing two levels of message content with two levels of a heuristic cue actually creates two additional levels of information congruity, and information incongruity under low importance/involvement conditions can effectively increase the motivation of information processing. Second, heuristic cues still function as heuristic cues rather than personal involvement. Their heuristic function is simply attenuated by their contradiction with message content. Discredited heuristic cues are perceived insufficient to form accurate attitudes, and this generates enough motivation for a scrutiny of message content.

Although the ANOVA is typically used in HSM/ELM studies, it may be an inadequate method to assess the impact of heuristic cue and message content on attitudinal judgment, particularly with the inclusion of information congruity/incongruity in this line of research. As shown in the analyses above, due to the confounding error between time restriction and message content, it was inappropriate to apply the ANOVA to congruity-related effects although these effects exist in virtually all HSM/ELM-based experiments. The regression model reported here, in which product evaluation was regressed on the cognitive responses to the restriction and message manipulations by the two levels of congruity, is therefore a better alternative to examine the impact of interest.

5.3. Managerial Implications

Strong scarcity appeals or high time restrictions are prevalent in the category of mass merchandise (Howard & Kerin, 2006), with which consumers in general are lowly involved. But a strong scarcity cue is not necessarily a guaranteed sell even when consumers do primarily rely on heuristics to judge the value of a product.

Positive inferences from scarcity cues can be easily discredited by negative impressions from product information. The contradiction motivates a deeper processing of the negative product information, and further decreases product evaluation and purchase likelihood. In other words, imposing scarcity on an inherently poor product will eventually hurt the sales of the product. Scarcity will be an effective promotional tool only if the promoted product is indeed of high quality. Nevertheless, some retailers may choose to emphasize scarcity cues and provide little product information when communicating to consumers. This should be considered unethical. The retailers simply take advantage of consumers' initial reliance on heuristic cues, and attempt to trap them into believing that an average product is an excellent product. To protect consumer rights and fair competition, it is highly recommended to implement a public policy that requires full disclosure of product information in advertisements that feature scarcity appeals.

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Appendix 1: Sample Advertisements

A

B

A: High time restriction with strong message content
B: Low time restriction with weak message content