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Decision-contextual and individual influences on scarcity effects

Hsuan-Hsuan Ku
Department of International Business, Soochow University, Taipei, Taiwan
Chien-Chih Kuo
Department of Psychology, Chung-Yuan Christian University, Chung Li, Taiwan
Yi-Ting Yang
Advanced Product Sourcing, hTC, Taoyuan, Taiwan, and
Tzu-Shao Chung
Logistic Support, hTC, Taipei, Taiwan

Abstract

Purpose – This study aims to examine the relative effectiveness of demand-related and supply-related explanations of the scarcity of a product, and specifically the extent to which decision context and individual factors moderate purchase intention in response to those explanations.

Design/methodology/approach – The first of two formal experiments examines the effects of the two kinds of scarcity on participants' purchase intentions with respect to utilitarian and hedonic product types. The second tests for self-monitoring differences in participants' relative susceptibility to scenarios characterizing scarcity as either demand-generated or supply-generated, when their decisions are either private or subject to third-party scrutiny.

Findings – Experiment 1 shows that participants shopping for a utilitarian product are more inclined to respond positively to what they understand to be demand-generated scarcity, and less inclined to do so if the scarcity was attributed to limited supply; whereas the converse holds true for a hedonic product. Experiment 2 shows that for high self-monitors, increased purchase intention was the outcome of matching the alleged reason for scarcity to the demands of the decision context; low self-monitors were ready to consider demand-scarce products regardless of whether they knew that their consumption decisions would be subject to third-party scrutiny or private.

Originality/value – The paper identifies contextual and individual factors that explain and predict the extent to which one type of scarcity appeal may be more effective than another in influencing consumers' purchasing decisions.

Keywords Scarcity effects, Utilitarian and hedonic products, Public versus private consumption, Self-monitoring, Demand management, Product planning, Buying behaviour

Paper type Research paper

Introduction

The scarcity effect is a powerful social-influence phenomenon, harnessed by marketers as a means to increase the subjective desirability of products (Cialdini, 1993; Jung and Kellaris, 2004). As scarcity appeals have become an important element of marketing communications strategy in many practical situations, prediction of consumers' acceptance of product scarcity has emerged as a major research focus for both practitioners and academics.

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Scarcity can arise from changes in demand or supply (Gierl *et al.*, 2008). Demand scarcity arises when supply fails to meet market demand. Advertisers may present this limited availability in positive terms by means of such headline claims as "only while stocks last". Supply scarcity occurs when a vendor limits the number of units available to customers. The classic marketing strategy in that case is to promote a "limited edition" of the product.

Both forms of scarcity can increase product desirability, but generate distinct inference processes. Consumers interpret demand that has outstripped supply as evidence of the quality of the product in question (Worchel *et al.*, 1975; Van Herpen *et al.*, 2009). Since limited supply is taken to imply exclusivity, consumers value the possession of rare products as a means to emphasize their own "uniqueness" (Snyder, 1992) and attain social status (Lynn, 1992).

Previous studies have examined types of scarcity and the mechanisms explaining the effects of demand-generated versus supply-generated scarcity. They have concluded, in particular, that consumers may prefer products that are scarce due to excess demand if they are pursuing a goal of conformity, whereas they should be more likely to diverge from the majority in domains that others use to infer identity (Berger and Heath, 2007; Van Herpen *et al.*, 2009). However, researchers have so far paid relatively little attention to the conditions under which concerns about conformity or individuality are at stake, and consumers either do or do not climb on the bandwagon, as Van Herpen *et al.* (2009) put it. To fill that gap in the body of knowledge, the study reported here examines the relative effectiveness of retailers' demand-related and supply-related explanations of the scarcity of a product, and specifically the extent to which the context of the purchasing decision and consumers' personal attributes moderate purchase intention in response to those explanations.

Consumer choices are driven by both utilitarian and hedonic considerations. Although the consumption of many goods involves both dimensions to varying degrees (Batra and Ahtola, 1990), there is little doubt that consumers characterize some products as primary utilitarian and others as primary hedonic (Dhar and Wertenbroch, 2000). The former emphasize function or performance; the latter, pleasure or self-expression (Park and Moon, 2003). Utilitarian consumer behavior has been described as task-related and rational, whereas the hedonic alternative is more subjective and personal, reflecting fun and playfulness as the motivation, rather than task completion (Babin *et al.*, 1994). Previous researchers have suggested that advertising appeals that match the type of attitude object will lead to enhanced persuasion effects (Johar and Sirgy, 1991). Based on this principle of compatibility, the persuasive impact of demand-scarcity versus supply-scarcity appeals may depend on product type.

Consumer choices may be made in private or may be open to scrutiny by third parties. As consumption decisions are driven by utilitarian and hedonic considerations, so observers' evaluations of individuals' decisions are either rational or emotional. This distinction may lead consumers to focus relatively more or less on affective information, and result in differences in their susceptibility to reasons for scarcity that are framed in terms of either supply or demand.

However, there are individual differences in the extent to which individuals are willing to tailor their behavior to the demands of different situational contexts, for the sake of social appropriateness (Bearden *et al.*, 1989). This phenomenon has been defined by Snyder (1974) as "self-monitoring": a personality variable reflecting the

relative influence of internal versus external cues on personal behavior. The higher the predisposition to self-monitoring the greater is their "concern for the situational appropriateness of their expressive behavior" (Gangestad and Snyder, 2000). The "state-action orientation" described by Kuhl (1981) similarly addresses this personal characteristic. State-oriented individuals are more susceptible to contextual influences, whereas the behavior of action-oriented individuals may be governed by control mechanisms, which may make them less responsive to competing contextually-derived action tendencies that interfere with original intentions (Babin and Darden, 1995). It is thus logical to predict that high self-monitors' responses to an explanation that scarcity is either demand-generated or supply-generated will be moderated by their expectation of evaluation of their decision by third parties, and that the same will not apply to low self-monitors.

In conclusion, the investigation reported here exams whether the effectiveness of statements about reasons for scarcity varies according to their relative fit with the consumer's major goals, as triggered by the decision context. Specifically, the first of two formal experiments examines the effects of the two kinds of scarcity on participants' purchase intentions with respect to utilitarian and hedonic product types. The second tests for self-monitoring differences in participants' relative susceptibility to scenarios characterizing scarcity as either demand-generated or supply-generated, when their decisions are either private or subject to third-party scrutiny.

In the next section, the theoretical foundations of this research study are presented, and the two experiments described and discussed. The article concludes by discussing the experimental findings, identifying the managerial implications and suggesting the directions for further research.

The effects of demand-generated versus supply-generated scarcity

Research has focused on a variety of psychological mechanisms related to consumers' perceptions and reactions with respect to scarcity effects. One such is individuals' desire for "uniqueness and distinctiveness" (Snyder, 1992), provided that the scarcity they perceive is caused by short supply rather than high demand (Eisend, 2008). The effect of demand scarcity is driven by what Cialdini and Goldstein (2004) call a "social-proof mechanism," in which consumers rely on others' opinions as a clue to the value of a product.

To gain further insights into the two types of scarcity effect, and the dual motives of following the lead of others versus making independent choices, several authors have studied contextual or individual influences on the two distinct responses. Verhallen and Robben (1994) found that the effects of limited availability on book-buyers' choices varied according to their perceptions of social constraints. Van Herpen *et al.* (2005) related the two scarcity effects to consumers' "need-for-uniqueness". More recently, the same authors illustrated that the preference for a scarce product with high prior demand reverses when individuality is threatened by the proximity of fellow consumers (Van Herpen *et al.*, 2009). Gierl *et al.* (2008) examined the effects of supply scarcity, demand scarcity, and temporal scarcity on the desirability of products respectively associated with normal and conspicuous consumption patterns. Similarly, Gierl and Huettl (2010) investigated the interaction between the supply-related and demand-related reasons for scarcity given by retailers and a product's suitability for conspicuous consumption.

Table I summarizes the research studies reported in the literature that investigate the relative effects of demand-generated versus supply-generated scarcity. Their key findings suggest that scarcity effects can be moderated by contextual or individual factors. The study reported here cross-references those variables to product type (utilitarian or hedonic), the nature of individuals' decision-making ("private", rational or emotional), and the individual's propensity to self-monitor.

Decision-contextual influences and scarcity effects

Effect of product type

The empirical work of previous researchers has shown that products can be classified into two product types (Hirschman and Holbrook, 1982; Batra and Ahtola, 1990; Dhar and Wertenbroch, 2000). Consumption of the utilitarian type is typically cognitively driven, instrumental and goal-oriented, and accomplishes a functional or practical task. In contrast, the consumption of hedonic products is primarily characterized by emotional satisfaction and self-expression (Strahilevitz and Myers, 1998; Park and Moon, 2003; Ryu *et al.*, 2006). Products that are high on utilitarian value are likely to be subject to cognitive or reasoned preference, and those high on hedonic value subject to affective or emotional preference. Dhar and Wertenbroch (2000) state this distinction in terms of products one believes one "should" prefer versus those one "wants" to possess.

Rossiter *et al.* (1991) linked product type to buying motives, arguing that purchasers of utilitarian products were motivated to seek information, whereas the motivation of those choosing hedonic products was transformational. Similarly, Chernev (2004) has since suggested that utilitarian products may help to attain prevention goals, and

Article	Scarcity message	Moderator	Findings
Verhallen and Robben (1994)	Supply scarcity, demand scarcity and "accidental" scarcity	Social constraints	The effects of product availability on consumer's preference for recipe books varied according to whether or not the presence of other consumers is emphasized
Van Herpen *et al.* (2005)	Supply scarcity and demand scarcity	Need for uniqueness	This moderator enhances quality inferences only when scarcity is attributed to limited supply
Gierl *et al.* (2008)	Supply scarcity, demand scarcity and temporal scarcity	Conspicuous or non-conspicuous consumption	The product category is a relevant factor, influencing the direction of scarcity effects on product desirability
Van Herpen *et al.* (2009)	Supply scarcity and demand scarcity	Store location	The preference for a scarce product with high prior demand reverses when individuality is threatened by the proximity of fellow consumers
Gierl and Huettl (2010)	Supply scarcity and demand scarcity	Conspicuous or non-conspicuous consumption	The existence of a positive scarcity effect depends on the product's suitability for conspicuous consumption

Table I.
Summary of empirical research on the effects of demand-generated versus supply-generated scarcity

hedonic products to satisfy promotion goals. Kaltcheva and Weitz (2006) refer to utilitarian motivation as "task-oriented motivational orientation", and its hedonic counterpart as "recreational motivational orientation".

Recent studies have increasingly recognized the importance of goals and motives in shaping consumer behavior (Kaltcheva and Weitz, 2006; Chernev, 2004; Pham and Avnet, 2004; Zhou and Pham, 2004), specifically with respect to the influence of those factors on susceptibility to persuasion by advertising. Demand-scarcity appeals tend to invoke "social proof" by claiming that a product is a top seller, or at least especially popular, in the expectation that consumers will interpret this reason for scarcity as evidence of product superiority (Van Herpen *et al.*, 2009; Gierl and Huettl, 2010), on the grounds that the probability of so many people buying a bad product ought to be rather small (Gierl *et al.*, 2008). Since items of high utilitarian value are likely to be subject to reasoned preferences, based on "information" rather than "transformation" (Rossiter *et al.*, 1991), consumers will wish to have the kind of information that allows them to form an accurate judgment of product performance. Demand-scarcity appeals in which the basis of the popularity is compatible with the consumer's major goals related to utilitarian products will convey a sense of greater choice.

By contrast, supply-generated scarcity of utilitarian products may not be an appropriate basis for the stimulation of intention to purchase, since it provides no clue as to the buying behavior of others. Consumers are unlikely to be able to deduce that detail for themselves, and will place less weight on the marketing messages focused on scarcity appeals.

Different decision tasks are presented by the non-tangible attributes of hedonic products and the experiential needs they fulfill (Micu and Chowdhury, 2010). Since the evaluation of each stimulus will depend on "affective preferences" (Dhar and Wertenbroch, 2000), consumers will place more emphasis on "emotional" information (Drolet *et al.*, 2007) in pursuit of goals that are "transformational" (Rossiter *et al.*, 1991) or "promotional" (Chernev, 2004), and will be persuaded by the symbolic appeals of a product (Micu and Chowdhury, 2010). In a situation of scarcity, when the number of potential purchasers of the same product is intentionally limited, possession can evoke a feeling of being somehow special, and thereby enhance consumer responses. Lynn (1991) has suggested that the need for a sense of personal individuality might be expected to produce stronger effects in response to supply-generated scarcity in the case of products that are typically valued for their symbolic and self-defining properties. Similarly, Aggarwal *et al.* (2011) have very recently found that that scarcity messages will interact significantly with the brand concept, in that a restricted offer will have a stronger effect on purchase intentions for a symbolic brand than for a functional brand.

Conversely, excess demand implies that the product is popular, but by definition not exclusive. The appropriateness of the scarce product as a status symbol is therefore decreased. Furthermore, a greater sense of uniqueness can no longer be achieved by purchasing this product (Gierl *et al.*, 2008). On the contrary, consumers who do so will associate themselves with many other owners of the same product (Worchel, 1992), and those governed by affective-emotional preferences can be expected to reject it. Thus, demand scarcity can be assumed to have a negative effect in the case of hedonic products (Gierl *et al.*, 2008). Van Herpen *et al.* (2009) have demonstrated that relative scarcity due to excess demand can result in "bandwagon" effects that cannot be accounted for by uniqueness theory. This preference for a scarce product with high prior demand

reverses, however, when that uniqueness is threatened. Similarly, Berger and Heath (2007) found that in identity domains, participants avoided the options preferred by majorities. On the basis of the preceding discussion, it is hypothesized that:

H1a. For utilitarian products, purchase intention increases as a result of demand-generated scarcity, and decreases as a result of supply-generated scarcity.

H1b. For hedonic products, purchase intention increases as a result of supply-generated scarcity, and decreases as a result of demand-generated scarcity.

Effect of public versus private consumption and self-monitoring

Studies comparing "public" and "private" product choices have shown that, in general, the degree to which consumers believe their consumption of a product to be socially visible appears to increase the effect of social influence on purchase intentions (Graeff, 1996; Kulviwat *et al.*, 2009). That influence is manifested as a higher likelihood of conforming with relevant social norms when consumption is a public act (Ratner and Kahn, 2002), the motives being to win the social approval of others, build rewarding relationships with them, and in the process to enhance self-esteem.

This phenomenon of self-monitoring has attracted growing attention from social psychologists and consumer-behavior researchers since being first described by Snyder (1974). Slama and Celuch (1995) argued that self-monitoring is important in understanding marketplace behavior because it relates to interpersonal influence, which is itself an important consumer-behavior issue. Puccinelli *et al.* (2007) have since noted that its importance in the marketing context is underscored by its robust effect on behavior.

"High self-monitors" are individuals who regulate their self-presentation for the sake of public appearance. They are highly responsive to social and interpersonal cues concerning situationally appropriate behaviors and are concerned with personal "impression management" (Harnish and Bridges, 2006). They may employ "protective self-presentation" and "impression enhancement" behavior to keep others from forming negative images of them (Fuller *et al.*, 2007). "Low self-monitors", by contrast, lack the ability or motivation to regulate their self-expression, allowing their behaviors to be determined by internal rather than external factors (Puccinelli *et al.*, 2007).

It follows that high self-monitors' expectations of how others will evaluate their decision will influence their consumption decisions. Perceived third-party pressure to appear rational will induce them to evaluate products on the basis of their potential to perform their intended function, and to be sensitive to rational arguments concerning product quality. Demand-scarce products thus become an attractive means for enhancing self-image. On the contrary, the emphasis of supply-scarcity appeal on product uniqueness may have a negative effect on high self-monitors, who are less likely to match the responses of others to justify their choice and obtain social approval. It is therefore hypothesized that:

H2a. High self-monitors' intention to purchase increases as a result of demand-generated scarcity, and decreases as a result of supply-generated scarcity, when their decisions are subject to perceived third-party pressure to make rational decisions.

Perceived third-party pressure to make decisions on an emotional rather than rational basis will prompt high self-monitors to evaluate products on the basis of their potential to enhance feelings and emotions. Since supply-scarce products can deliver symbolic benefits to such affect-driven consumers, they may be expected to be more responsive to supply-scarcity appeals. In contrast, demand-scarcity suggests that a large number of others already have the product, which decreases its ability to communicate symbolic meanings. It is therefore assumed that the expectation of third-party pressure to favor emotional decision-making may make high self-monitors feel uncomfortable about choosing demand-scarce products. Accordingly, it is hypothesized that:

H2b. High self-monitors' intention to purchase increases as a result of supply-generated scarcity, and decreases as a result of demand-generated scarcity, when their decisions are subject to perceived third-party pressure to make emotional decisions.

When individuals' decisions are private, there is no evaluation by any third party, and therefore no need to monitor and regulate one's self-presentation for the sake of appearance. High self-monitors would be expected to be less likely to engage in conscious and deliberate attempts to gain social approval, and would therefore be less sensitive or responsive to either demand or supply scarcity. Thus:

H2c. High self-monitors' intention to purchase is not affected by scarcity ascribed to either excess demand or limited supply, when their decisions are not subject to perceived third-party pressure.

Research studies have found that low self-monitors judged product quality on the basis of performance (Johar and Sirgy, 1991; DeBono, 2000) and were convinced more by rational information about how well the product functioned than by emotional concerns (Snyder and DeBono, 1985). Given that high consumer demand implies that the product must be good, low self-monitors can thus interpret demand-generated scarcity as a signal of intrinsic benefits, and as a reason for intending to purchase it.

Low self-monitors are less likely than high self-monitors to adjust their self-presentation on the perceived demands of the situation, not having acquired a concern for their social image (Kavak *et al.*, 2009). Therefore, they can be expected to be unlikely to choose items in public that they do not favor in private, in order to make others think they are more inclined to make emotional decisions. The marketing appeals based on supply-generated scarcity would thus be less relevant than those based on demand-generated scarcity. Accordingly, it is hypothesized that:

H3. Low self-monitors' intention to purchase increases as a result of demand-generated scarcity, and is not affected by supply-generated scarcity, whether their decisions are subject to either kind of perceived third-party pressure or are private.

Experiment 1

Design and sample

This experiment tested *H1*, which predicts that:

- consumers' intention to purchase utilitarian products increases when scarcity is attributed to heavy demand and decreases when it is attributed to short supply; and

- the relationship between purchase intention and demand-related or supply-related scarcity is reversed in the case of hedonic products.

Two between-participant factors were manipulated in a 3 × 2 design that consisted of a scarcity appeal condition (none, demand-generated or supply-generated) and a product-type factor (utilitarian or hedonic). The experimental subjects were 262 undergraduate students enrolled in management or business courses at a large university in Taiwan, with an average age of almost 21 years, of whom 65 percent were female. The methodological justification for a student sample is presented in the General Discussion.

Pretest

A pretest was conducted to assess the relevance to the student sample of the products chosen as test objects and distinguish those that they would regard as either more utilitarian or more hedonic.

A sample of 30 undergraduates rated the personal relevance of each of five generic products – sunscreen, chocolate, perfume, a drinking tumbler and an alcoholic beverage – on three seven-point scales proposed by Drolet *et al.* (2007). The respective scale anchors were: "irrelevant/relevant to me", "unimportant/important to me", and "means nothing/a lot to me". The participants in the pretest were also asked to categorize their buying decisions with respect to the same five products by responding to five statements on a scale anchored at 1 = "absolutely no" and 7 = "absolutely yes", adopted by Park and Moon (2003) from an original proposed by Vaughn (1986) on the basis of think-feel dimensionality. The statements were: "buying decision-making is made logically and objectively"; "buying decision-making is primarily based on a functional perspective"; "buying decision-making is primarily based on feelings"; "buying decision-making reflects the buyer's personality"; and "buying decision-making is primarily based on appearance, taste, touch, smell, or sound."

Analysis of the resulting scores showed that sunscreen was seen as the most utilitarian type of product and chocolate as the most hedonic, and that those two of the five products were roughly equal in terms of their perceived relevance to the participants.

Stimuli

Written scenarios were used to manipulate the types of scarcity and product, adapted from Jung and Kellaris (2004). They evoked a relatively hedonic or utilitarian item that was either scarce or plentiful, in a hypothetical buying situation, as follows:

> Imagine that you go to a shop to buy some chocolates [or some sunscreen] and find Product X on display. The sales assistant mentions [either that] there are only two of them left in stock as a result of limited supply [or excess demand]; [or that] there are plenty of them in stock. He also recommends Product Y as an alternative for your consideration, which has a similar taste [or a similar sun-protection performance] and costs slightly less, and also in plentiful supply though not on display.

Procedures

Self-administered questionnaires were distributed and completed during regular class sessions. Participants were assigned randomly to an experimental scenario, provided with detailed instructions, and asked to work independently without talking or looking at the responses of other participants.

Section 1 of the questionnaire presented one of six possible scenarios, accompanied by a purchase intention scale. With the measurement of the dependent variable completed, several items designed to check on the manipulation of scarcity and product type were deployed. To verify that the first of these had been successful, participants were instructed to respond to a statement adopted from a study by Eisend (2008), "How available do you think Product X is", on a seven-point scale anchored by "rather inadequate" and "rather adequate". In both demand- and supply-generated scarcity conditions, participants who perceived the availability of the product to be relatively inadequate (score < 4) were further asked to identify the stated cause of the scarcity: heavy demand or limited supply. Verification of the manipulation of product type used the same scale as in the pretest. Section 2 of the questionnaire gathered gender and age data for a demographic description of the sample.

Measures

Based on the scales developed by Dodds *et al.* (1991), purchase intention was measured by responses on seven-point scales anchored at very low and very high to items relating to the participant's willingness to buy Product X, the likelihood of purchasing it, and the probability of considering buying it. The Cronbach's alpha coefficient for this scale was 0.95, very well above the generally accepted threshold of 0.70.

Results

The success of the scarcity manipulation was tested by pairwise comparisons. Both the limited-edition scenario ($M_{\text{supplyscarcity}} = 2.23$) and heavy-demand scenario ($M_{\text{demandscarcity}} = 2.42$) led to a significantly lower perception of the level of availability of the product than did the no-scarcity condition ($M_{\text{nonscarcity}} = 5.69$; F (1, 174) $= 791.66$, $p < 0.001$ and F (1, 172) $= 705.86$, $p < 0.001$ respectively). Furthermore, no difference was found between the perceived availability for the two scarcity appeals (F (1, 172) $= 2.20$). All participants in both the demand-generated and supply-generated scarcity conditions correctly identified the reasons for product scarcity.

As expected, participants viewed sunscreen as offering more utilitarian satisfaction than chocolate ($M_{\text{sunscreen-utilitarian}} = 5.02$ versus $M_{\text{chocolate-utilitarian}} = 3.39$, $F(1, 260) = 142.85$, $p < 0.001$), while chocolate was perceived to be relatively more hedonic than sunscreen ($M_{\text{sunscreen-hedonic}} = 3.94$ versus $M_{\text{chocolate-hedonic}} = 5.39$, $F(1, 260) = 182.00$, $p < 0.001$).

A 3×2 (scarcity appeal $\times$ product type) ANOVA indicated the significant interaction (F (2, 256) $= 49.80$, $p < 0.001$, $\eta^2 = 0.261$) shown in Figure 1[1]. Contrast analysis found that, in the case of the sunscreen, participants expressed higher purchase intentions when they knew that it was scarce on account of heavy demand than when there was no scarcity ($M = 5.19$ and 3.93 respectively, t (84) $= 4.62$, $p < 0.001$), whereas their purchase intentions in the presence of supply-scarcity information were substantially lower ($M = 3.16$, t (79) $= 2.59$, $p < 0.05$). In the case of the chocolate product, by contrast, the heavy-demand scenario resulted in significantly lower purchase intentions than when there was no scarcity ($M = 4.02$ and 4.60 respectively, t (86) $= 2.01$, $p < 0.05$), whereas the limited edition claim increased participants' purchase intentions from 4.60 to 5.86 (t (93) $= 5.44$, $p < 0.001$). These findings offer support for *H1*.

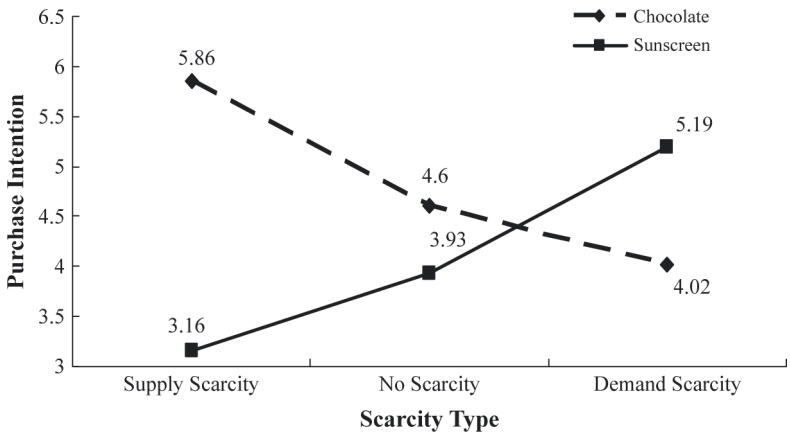

Figure 1.
Interaction of scarcity type and product type

Discussion

The results of experiment 1 confirm that the effect of scarcity appeals on purchase intentions depends on product type. Specifically, participants were found to be more inclined to adopt the utilitarian product when its scarcity was said to be due to heavy demand, and less inclined to do so if the scarcity was attributed to limited supply. In contrast, their purchase intentions with respect to the hedonic product increased in response to supply-generated scarcity, and decreased in response to demand-generated scarcity.

To summarize, the results of experiment 1 show that participants were more susceptible to scarcity appeals that were congruent with the utilitarian or hedonic nature of the product type. In experiment 2, further manipulation of rational versus emotional decision-making motives was undertaken, in order to confirm that the stronger purchase intentions found in experiment 1 were attributable to compatibility between the major goals triggered by the decision context and the appeal of the specific scarcity tactic. Experiment 2 also examines the psychological and contextual boundary conditions within which the scarcity effect operates.

Experiment 2

Design and sample

This second experiment addressed *H2a*, *H2b* and *H2c*, and *H3*. Specifically, it examined the relative susceptibility to demand-scarcity versus supply-scarcity scenarios exhibited by individuals with respectively high and low propensities to self-monitor, when they were told their consumption decisions would be either subject to third-party scrutiny or would remain private.

Three between-participant factors were manipulated in a $3 \times 3 \times 2$ design that consisted of a scarcity appeal condition (none, demand-generated or supply-generated), an evaluation condition factor (private, rational or emotional), and a self-monitoring propensity factor (low or high). While the scarcity appeal and evaluation conditions were manipulated experimentally, self-monitoring was measured using the eighteen-item Self-Monitoring scale developed by Snyder and Gangestad (1986). Sample items from the self-monitoring scale include: "In different situations and with different people, I often act like very different persons," "I am not particularly good at

making other people like me," and "I have trouble changing my behavior to suit different people and different situations". Categorization of respondents as high or low self-monitors was determined by the value of their individual scores being above or below the median split of all scores, as suggested by Graeff (1996) and Harnish and Bridges (2006). The outcome was that 51 percent of the sample were high self-monitors and 49 percent low self-monitors, around a median score of 8.00. The experimental subjects were 1,067 undergraduate and graduate students ($n_{\text{highself-monitors}} = 541$, $n_{\text{lowself-monitors}} = 526$) with an average age of 21 years, of whom 62.5 percent were female, enrolled in management or business courses at a large university in Taiwan. The methodological justification for a student sample is again presented in the general discussion.

Procedures

The procedure followed that of experiment 1, with one modification: the rational-emotional nature of participants' decision making was manipulated in terms of third-party scrutiny rather than product type. Experiment 2 therefore focused on products that had been judged equally hedonic and utilitarian, to rule out the influence of product type. Based on the pretest already described, a drinking tumbler was chosen as the target product.

Self-administered questionnaires were distributed and completed during regular class sessions. Participants were randomly assigned to one of the three experimental conditions: a single "private" condition, in which they were told that their decision would not be made known to anyone else, and two in which they knew that their choices would be evaluated by someone else. Those evaluations would be either of how rational their decision was or how emotional it seemed to be. This procedure is similar to that in a study of "private" versus "public" consumption by Ratner and Kahn (2002).

After the procedures had been explained to the participants, they were asked to read a written scenario, in which they were purchasing a new tumbler, and afterwards complete a questionnaire that included the items related to the dependent variable, plus the manipulation-check questions about scarcity appeals and the self-monitoring questionnaire. The intention-to-purchase scale was the same as in experiment 1; the Cronbach's alpha coefficient was 0.94, very well above the generally accepted threshold of 0.70. Gender and age data were also collected, for a demographic description of the sample.

Results

The manipulation checks for scarcity appeals mirror those from experiment 1. The test results showed that participants exposed to the "limited edition" scenario perceived the product be significantly more scarce than did those whose scenario pictured the product as plentiful ($M_{\text{supplyscarcity}} = 2.40$, $M_{\text{nonscarcity}} = 4.97$, F (1, 722) = 1405.97, $p < 0.001$). Similarly, those who had read the scenario evoking demand-generated scarcity ($M_{\text{demandscarcity}} = 2.50$) rated the product as less available than those reacting to the no-scarcity scenario (F (1, 733) = 1415.97, $p < 0.001$). Furthermore, there was no significant difference in the mean availability scores between participants assigned to the demand-generated and limited-edition scarcity conditions (F (1, 673) = 2.70). The reason for product scarcity was identified correctly by all participants in both conditions.

A 3 × 3 × 2 (scarcity appeal × evaluation condition × self-monitoring) ANOVA[2], with purchase intention as the dependent variable, indicated significant interaction between scarcity appeal and self-monitoring (F (2, 1049) = 8.74, $p < 0.001$, $\eta^2 = 0.015$) and between scarcity appeal and evaluation condition (F (4, 1049) = 10.68, $p < 0.001$, $\eta^2 = 0.036$). The three-way interaction effect was also significant (F (4, 1049) = 7.66, $p < 0.001$, $\eta^2 = 0.026$).

Beyond these F-test results, more significant conclusions can be drawn from examination of the pattern of differences in purchase intention among the scarcity appeals for each evaluation condition[3]. Figure 2 shows that there is a crossover moderating effect between the emotional and rational alternatives. Specifically, when participants were told that their consumption decisions would be subject to third-party pressure to appear rational, high self-monitors recorded higher intention-to-purchase scores in the demand-generated scarcity condition ($M = 5.13$, t (124) = 4.53, $p < 0.001$) than in the no-scarcity condition ($M = 4.07$) and lower scores in response to supply-generated scarcity ($M = 3.59$, t (132) = 2.27, $p < 0.05$). These results provide support for *H2a*. The opposite effect was found when participants had been told that the third-party pressure would be to have made an emotional decision: high self-monitors expressed higher intention to purchase when they had been told that the scarcity of the product was due to limited supply than when they had not been told that it was scarce ($M = 4.93$ and 4.24 respectively, t (124) = 2.85, $p < 0.01$), and substantially lower intentions when they believed the scarcity to be demand-generated ($M = 3.58$, t (143) = 3.35, $p < 0.01$). *H2b* is thus also supported.

When decisions were private, high self-monitors' intention-to-purchase scores were not affected by the attribution of the scarcity to either demand ($M_{\text{demand-scarcity}} = 4.23$,

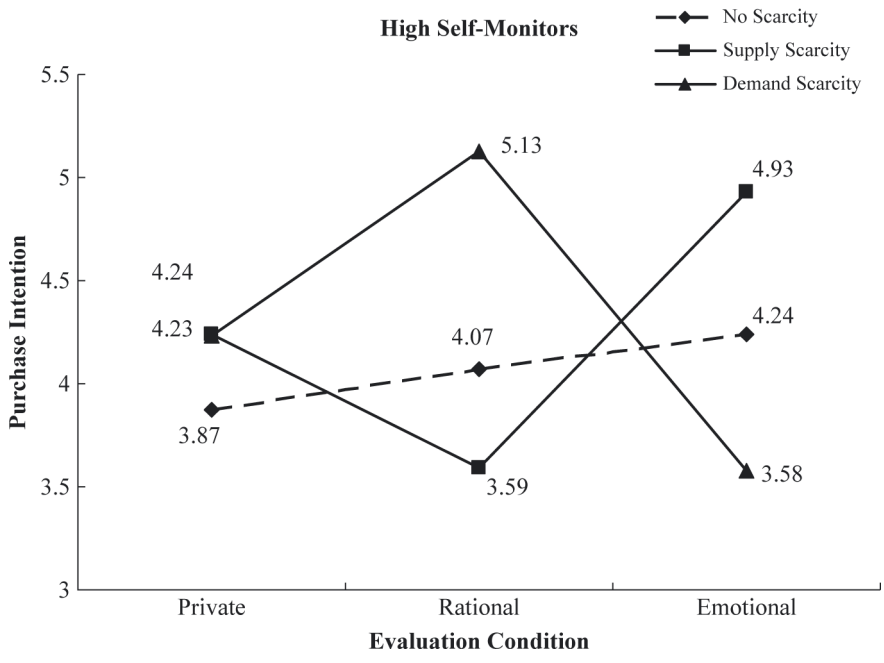

Figure 2.
Interaction of scarcity type and third-party evaluation, for high self-monitors

$M_{nonscarcity} = 3.87$, t (110) = 1.54) or supply ($M_{supply\text{-}scarcity} = 4.24$, t (93) = 1.54). This result supports *H2c*. Compared to perceived third-party pressure to appear rational or emotional, high self-monitors whose decision were not subject to third-party pressure would be less sensitive or responsive to either demand or supply scarcity. There was thus an ordinal moderating effect between private and rational/emotional decision making.

Figure 3 shows that low self-monitors' purchase intentions were found to increase as a result of demand-generated scarcity and were unaffected by supply-generated scarcity, whether participants were informed that their decision-making would be evaluated by other participants as rational or emotional, or that their decisions would be made in private. In the rational-decision condition, the mean scores were 5.14 for demand-scarcity, 4.10 for supply-scarcity, and 3.99 for non-scarcity; the t-test results were t (126) = 5.61, $p < 0.001$ for demand-scarcity versus no scarcity, t (128) = 0.44 for supply-scarcity versus no scarcity. In the emotional-decision condition, the mean scores were 4.83 for demand-scarcity, 3.99 for supply-scarcity and 4.02 for non-scarcity; the t-test results were t (116) = 3.45, $p < 0.001$ for demand-scarcity versus no scarcity and t (126) = 0.12 for supply-scarcity versus no scarcity. When decisions were made in private, the mean scores were 4.85 for demand-scarcity, 4.21 for supply-scarcity, and 3.98 for non-scarcity; the t-test results were t (104) = 3.61, $p < 0.001$ for demand-scarcity versus no scarcity and t (109) = 1.01 for supply-scarcity versus no scarcity. These results support *H3*.

Discussion

Experiment 2 provides support for the argument that expectations of how others will evaluate their decision moderate high self-monitors' evaluations of demand-generated

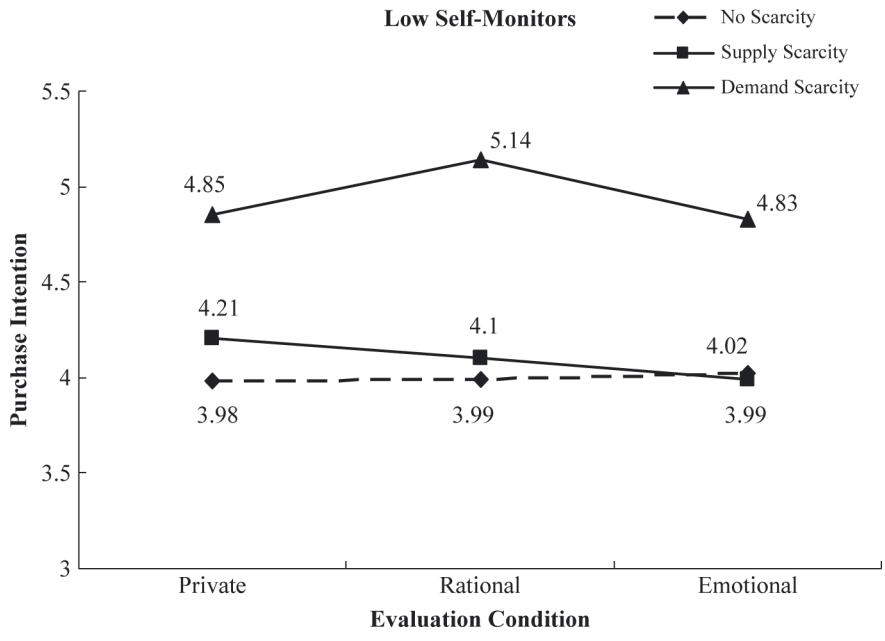

Figure 3.
Interaction of scarcity type and third-party evaluation, for low self-monitors

versus supply-generated scarcity, but not those of low self-monitors. Specifically, the image-conscious high self-monitors are susceptible to demand scarcity when they think observers will be judging how rational their choices are, whereas they are driven by a desire to present themselves as emotional decision-makers by choosing a supply-scarce option. These results provide evidence that persuasion occurs when appeal and motive match. When decisions are private, high self-monitors are not influenced by either form of scarcity. The behavior of low self-monitors is more consistent across situations. In the experiment, they were convinced more by demand-generated scarcity than by the image-based messages that scarcity is supply-generated, whether their decisions were subject to third-party pressure to appear rational or emotional, or were private.

General discussion

Scarcity due to excess demand can result in bandwagon effects that uniqueness theory cannot account for, and thus operates in a different way than scarcity due to limited supply. To date, investigations of product scarcity have mainly examined the mechanisms explaining the effects of demand-generated versus supply-generated scarcity. This study has identified contextual and individual factors that explain and predict the extent to which one type of scarcity appeal may be more effective than another in influencing consumers' purchasing decisions, which have until now not been examined in detail.

The results of experiment 1 show that the effectiveness of a message linking scarcity to a shortfall in supply was enhanced if the product had a dominantly hedonic rather than utilitarian nature. Conversely, the persuasive impact of demand-generated scarcity is greater for a product offering utilitarian satisfaction rather than hedonism. Evidence from experiment 1 supports the propositions in the literature that purchasers of utilitarian products are motivated to seek information and satisfy their prevention goals, and those who buy hedonic products by a transformational motive and promotion goals. Intention to purchase is thus enhanced by scarcity messages that either signal product popularity or promise symbolic benefits compatible with the prospective purchaser's informational versus transformational motives or their prevention versus promotion goals.

This finding supplements those of Berger and Heath (2007) and Van Herpen *et al.* (2009), who found that consumers are more likely to diverge from the majority in the case of product classes that are seen as symbolic of identity. In a related stream of research, Babin and Babin (2001) found that changes in consumers' categorization of retail stores by type can affect reactions that contribute to a firm's success or failure. Specifically, a typical store produces a positive direct impact on purchase intention, producing increased utilitarian shopping value through the positive purchase intentions, whereas consumers expect that the excitement experienced in patronizing an atypical store makes for a more personally gratifying experience.

Consumers' purchase intentions are influenced not only by the product type but also by their expectations of how others will evaluate their decision, and by their propensity to self-monitor. As predicted, when participants in the experiments were concerned about how rational their decision-making made them appear to others, they were inclined to choose demand-scarce items and to avoid supply-scarce items. Conversely, one cause of greater willingness to choose a supply-scarce product over a

demand-scarce one, when the decision was transparent, was the expectation that other parties would want the choice to be made on the basis of emotions. In the particular case of high self-monitors, neither form of scarcity had any effect on purchase intentions if they knew that their decision would not be evaluated by a third-party.

Confirming a finding of Snyder and DeBono (1985), participants who were low self-monitors were more persuaded by appeals to reason than by image-based appeals. A heightened desire to make a rational decision led low self-monitors to be more responsive to messages invoking demand-scarcity than to those invoking supply-scarcity. They were furthermore less willing to put on a show to please those around them, preferring instead to adhere to their intrinsic beliefs and feelings. The results of experiment 2 thus provide further support that high and low self-monitors exhibit different behavior. For high self-monitors, who are image-conscious, an increase in purchase intention is the outcome of matching the alleged reason for scarcity to the demands of the decision context. Low self-monitors, who are more concerned with principles, are ready to consider demand-scarce products whether or not they know that their consumption decisions will be either private or subject to third-party scrutiny.

Managerial implications

The findings of the two experiments reported in this paper are particularly interesting for marketers in two ways. First, the study shows that scarcity has neither an overall positive effect nor an overall negative effect on purchase intentions. The strength and direction of the effects depend on the messages received about the cause of the scarcity and on the type of product concerned. If a marketer wants to promote the sales of a utilitarian product by sending out a signal about scarcity, it is advisable to attribute it to demand, not to a shortfall in supply. If the product is of the hedonic type, the reverse applies: emphasizing that it is in short supply can be advantageous, while signaling high demand as the cause of the scarcity may be detrimental.

Second, the conclusions of this study suggest that marketers who know that customers' purchase choices will be made in public should deploy the supply-generated explanation in their promotional messages, to convince potentially highly self-monitoring customers that others will assess their decisions as being based on affects and emotions. This strategy does not apply if customers are likely to be low self-monitors, who are not similarly susceptible to third-party influence. If, on the other hand, target consumers are either high self-monitors who feel third-party pressure to be rational in their decision-making or low self-monitors predisposed to rationality, attributing scarcity to high demand is the most appropriate strategy. Explaining the scarcity in terms of supply may simply not be worth the effort and expense.

Limitations and suggestions for future research

The findings of the experiments, and their managerial implications, must be considered in the light of certain limitations. Each of those in turn represents an opportunity for further research.

The participants in experiment 1 reacted to a single example of each of two product types: utilitarian sunscreen and hedonic chocolates. However, there could have been other kinds of difference between the two products, which could have determined the observed experimental effects. To investigate the moderating effect of product type on

scarcity effects more fully, future experiments should include a wider range of examples of both types.

Experiment 2 tested predictions that an individual's propensity to self-monitor moderates the effects of expected third-party evaluation on the effects of the two types of scarcity. Future studies could test the influence of other variables as potential moderators of the desire to modify one's behavior to match a social situation, such as individualism versus collectivism.

The study investigates the effects of scarcity on consumer choice with respect to fictitious brands, and caution is required in generalizing findings to well-known brands. It is acknowledged that scarcity may not always induce interest in and desire for familiar brands because existing attributes may serve as important inputs to judgments and decisions.

Lastly, the participants in both experiments were students enrolled in management or business courses at a university in Taiwan. Though the products featured in the experimental scenarios, were relevant to that target market, due caution must be exercised in generalizing the findings to broader socio-demographic or geographic contexts.

Notes

1. A check was made for the potential effect of age and gender on participants' responses to the dependent variables. ANCOVA showed that these two consumer characteristics were not significant determinants.
2. As in experiment 1, the data were checked for significant influences of age and gender on participants' responses to the dependent variables; none was found.
3. Spotlight analysis yields nearly the same results as those reported in the paper.

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About the authors

Hsuan-Hsuan Ku is a Professor of Department of International Business, Soochow University, Taiwan. She holds a PhD in marketing from National Taiwan University. Her research interests include consumer behavior and marketing communication. She has published in *The Service Industries Journal, Industrial Marketing Management, Psychology and Marketing, Journal of Management* (in Chinese), *Management Review* (in Chinese), *NTU Management Review* (in Chinese), *Sun Yat-Sen Management Review* (in Chinese) among others.

Chien-Chih Kuo is an Associate Professor of Department of Psychology, Chung-Yuan Christian University, Taiwan. He holds a PhD in psychology from National Taiwan University. His research interests include industrial marketing strategies, organizational culture and Chinese indigenous psychological research. He has published in *The Service Industries Journal, Industrial Marketing Management, Psychology and Marketing, Journal of Management* (in Chinese), *Management Review* (in Chinese), *NTU Management Review* (in Chinese), *Sun Yat-Sen Management Review* (in Chinese), *Chinese Journal of Psychology* (in Chinese) among others. Chien-Chih Kuo is the corresponding author and can be contacted at: cckuo@cycu.edu.tw

Yi-Ting Yang holds an MBA with a specialization in international business from Soochow University, Taiwan. Her research interests include consumer behavior and marketing strategies.

Tzu-Shao Chung holds an MBA with a specialization in international business from Soochow University, Taiwan. Her research interests include consumer behavior and marketing strategies.