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When Less Sells More and When it Does Not: The Impact of Product Scarcity on Preference and Choice

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When Less Sells More and When it Does Not:
The Impact of Product Scarcity on Preference and Choice

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Whereas product scarcity is generally thought to enhance product preference and choice, this research distinguishes two different mechanisms of scarcity effects and reveals that scarcity can also decrease choice. Scarcity due to limited supply signals exclusivity, whereas scarcity due to excess demand signals popularity. This provides social comparison information about the social status and appropriateness of consumption of the scarce product. When the need to be unique is activated, and products may be owned by relevant others, scarcity due to excess demand in fact reverses the preference for scarce products.

Scarcity is omnipresent and profoundly influences consumer behavior (Inman, Peter, and Raghurir 1997; Lynn 1991). Natural resources such as oil and water and products such as paintings by Picasso and the Playstation Portable can all be scarce. Confronted with an abundance of products to choose from (Schwartz 2004), relative scarcity of one product compared with others may guide preference formation and choice (Cialdini 2001). How extreme the effects of scarcity can be is illustrated by Rao's Restaurant in New York, which has only ten tables and is infamous for being difficult to get in to. Co-owner Frank Pellegrino reveals that people from across the country are willing to change their holiday plans to obtain a reservation (Burns 1999).

Consumers often encounter information concerning the scarcity of a product compared with alternatives. For instance, Amazon.com mentions the number of books remaining in stock, the reservation signs in adjacent restaurants indicate how many tables are occupied, and store shelves are incompletely filled with products. Because scarcity is determined by the difference between supply and demand, the relative scarcity of one product could be due to a more limited supply or a higher demand than other products.

Generally, scarce products are found to be more liked, preferred, and chosen than abundant products, and this effect has been investigated in economics (Becker 1991; Stock and Balachander 2005), psychology (Brock 1968; Lynn 1991), and marketing (Amaldoss and Jain 2005; Inman et al. 1997). A meta-analysis of prior research on scarcity found a reliable positive effect of scarcity on value (Lynn 1991). Despite these robust findings, however, we conjecture that there are common situations in which scarcity does not increase product preference and choice, but even decreases these. The present research aims to contribute to a better understanding of scarcity effects, by examining two different mechanisms through which

scarcity may promote choice: through inferences of popularity (when scarcity is due to excess demand) and through inferences of exclusiveness (when scarcity is due to limited supply). We intend to demonstrate that product choice critically depends on these inferences and that scarcity due to excess demand may decrease choice when relevant others may have bought the same product. When a product has become scarce because many others have bought it, also buying this product implies running the risk of appearing identical to these others. For many common products that express a consumer's individuality and image, such as clothing, jewelry, and cars, this is undesirable. Especially when relevant others, that is, people close to the consumer, may have bought the scarce product, consumers refrain from buying the scarce product.

The present research is, to our knowledge, the first to clearly separate the two mechanisms of scarcity. Rather than predicting universal positive effects of scarcity, it aims to specify conditions upon which consumers do or do not prefer scarce products. The next sections provide the conceptual background and predictions, which are tested in two experiments. The first experiment investigates the two proposed mechanisms and demonstrates that these differ by showing moderating effects of need-for-uniqueness for supply-caused scarcity but not for demand-caused scarcity. The second experiment shows that the possibility that relevant others own the product can reverse the effect of scarcity when scarcity is due to excess demand but not when scarcity is due to limited supply.

COMMODITY THEORY

According to commodity theory, anything that is useful to its possessor and can be conveyed to another person, that is, any commodity, "will be valued to the extent that it is unavailable"

(Brock 1968, 246). Although commodity theory was primarily developed to examine selectivity in the reception and transmission of information, its potential application to the consumption of scarce products was recognized from the start (Brock 1968). The general idea that unavailability leads to a more positive evaluation inspired research (Lynn 1991), across tangible and intangible objects, and objects with and without explicit economic value. In support of the premise, consumers indeed appear to prefer scarce products in diverse contexts, ranging from psychedelic experiences (Fromkin 1970) to pornographic materials (Zellinger et al. 1975), and from cooking books (Verhallen and Robben 1994) to fast moving consumer goods (Inman et al. 1997).

Surprisingly, commodity theory to date has emphasized scarcity effects due to supply reasons such as limited production quantities (Lynn 1989), time restrictions (Fromkin 1970), age restrictions (Zellinger et al. 1975), and purchase restrictions (Inman et al. 1997). As a consequence, much is known about the effects of supply-caused scarcity, but far less about the effects of scarcity caused by excess demand. Although effects on product preference appear similar at first sight (Verhallen and Robben, 1994), it is still an open issue whether the preference implications of supply-caused and demand-caused scarcity parallel, which the present research examines. In one of the few studies examining demand-caused scarcity, Worchel, Lee, and Adewole (1975) reduced the number of chocolate chip cookies available for their participants under the guise of high demand from another experiment in an adjacent room. As a result, the cookies became more desirable, which suggests parallel preference implications for supply-caused and demand-caused scarcity. However, the inferences about supply-caused and demand-caused scarcity should differ, and so may their preference effects. That is, whereas supply-caused scarcity communicates exclusiveness of the commodity (Amaldoss and Jain 2005), scarcity due to excess demand does not, and this is crucial. We predict that scarcity will not uniformly

increase product preference and choice. Specifically, the consumer's sense of individuality and uniqueness may be challenged when owning a commodity that is scarce due to excess demand, which may actually decrease evaluation of and preference for the scarce product. Thus, product scarcity conveys information about the choices that other consumers have made, conveying either that the product can not be obtained by many others (supply limitations) or that it has been previously obtained by many (excess demand). This information is likely to instigate social comparison processes that can increase or decrease product preference and choice, which we examine next.

SOCIAL COMPARISON IN SCARCITY

Consumers compare their abilities and opinions to others, as well as the products they own and use (Bearden and Rose 1990; Festinger 1954; Mussweiler 2003). To make these comparisons, consumers use information about the evaluations and choices of others, which can be obtained through communication with others, direct observation of others' behavior, and indirect observation, that is, by observing the traces of others' behavior. Social comparisons can thus affect evaluation and decision processes, even without interacting with other consumers or when other consumers are not even physically present (Dahl, Manchanda, and Argo 2001). One trace of other consumers' behavior that may be used in comparison processes is the product inventory level in stores, and the relative scarcity that may result from it (Razzouk, Seitz, and Kumar 2002). Low levels of inventory can indicate that many others have bought a product (demand-caused scarcity) or that only few others can potentially buy it (supply-caused scarcity). We argue that consumers use this information in their product evaluation.

Specifically, consumers assess their beliefs about a product (“is this product good?”) and predict their product preferences (“will I like this product?”) through comparisons with others (Suls 2000; Suls, Martin, and Wheeler 2000). Regularly, these comparisons are made with a general group of unspecified others (Cohen and Golden 1972; Reingen 1982). The behavior of these others can be a source of product information. For instance, which products other consumers use provides information on the appropriateness of consuming specific products, likely reactions by others to one’s own consumption, and one’s relative position or status when consuming certain products (Bearden and Rose 1990; Helgeson and Mickelson 1995). Thus, the relative scarcity of products provides clues about the appropriateness of consuming and the social status provided by these products. When demand is exceptionally high, others apparently find the product useful. By following the choice of these others, consumers may improve their own situation. Conversely, when supply is low, buying this product that only few others can obtain may increase consumers’ social status. Together this points to two distinct scarcity mechanisms.

Excess demand: the bandwagon effect

The behavior of others is informative, especially when consumers are uncertain about what is the appropriate behavior in a particular situation. Bystanders in an ambiguous emergency situation, therefore, look to one another to define the situation (Latané and Nida 1981) and less informed investors in financial markets base their expectations on the behavior of other investors (Lux 1995). This informative value of others’ behavior is also high for products, where consumers can use information on product choices of others to define their own product evaluations (Bearden

and Rose 1990; Burnkrant and Cousineau 1975). Excess product demand can thus provide social information and validation, and in this way can stimulate product choice because consumers follow others under the impression that ‘the crowd’ knows what is best (Banerjee 1992; Bikhchandani, Hirshleifer, and Welch 1998). The demand for a product increases due to others consuming the same product, a so-called bandwagon effect (Corneo and Jeanne 1997; Leibenstein 1950), and the mechanism for demand-caused scarcity operates through inferences of product popularity. We hypothesize:

H1: Product scarcity caused by excess demand promotes inferences of product popularity.

Limited supply: the snob effect

When scarcity is caused by limited supply, it is prestigious to be one of the happy few to own the scarce product (Fromkin 1970; Snyder 1992). Scarce products can be more expensive than regular products (Lynn 1989, 1992) and may be status symbols in and of themselves. Veblen (1899, 132) observed that the consumption of rare goods is evidence of pecuniary strength, stating that “... a beautiful article which is not expensive is accounted not beautiful.” By conspicuously consuming luxuries, consumers can demonstrate their identity and sense of uniqueness, and even their superiority relative to others (Bagwell and Bernheim 1996). Yet, scarcity also stimulates preference when scarce products are not expensive. This increase in product demand caused by others not consuming the same product is referred to as the snob effect (Corneo and Jeanne 1997). Snob effects occur merely because consumers want to be different from others, irrespective of product prices (Amaldoss and Jain 2005). Products in

limited editions should be preferred over regular products, even when prices are the same. Because not everybody can own them, they exhibit the uniqueness of the owner. Inferences of exclusiveness thus operate for a product that is scarce due to limited supply:

H2: Product scarcity caused by limited supply promotes inferences of product exclusiveness.

The need to be unique

Consumers compare themselves to others to assess their similarity to and distinctiveness from these others, because of the opposing needs to be included in social groups and to be distinctive from others (Hornsey and Jetten 2004). Thus, consumers want to feel *similar* to others, to be part of the group (MacDonald and Leary 2005). In wanting to belong (Baumeister and Leary 1995), consumers compare themselves to others and tend to revise their beliefs and evaluations to reduce discrepancies between themselves and others (Forsyth 2000). One way to emphasize the similarity with others can be through buying similar products as others have. Consumers also have a strong need to be *different* from others (Hornsey and Jetten 2004) and they can use products to attain this (Belk 1988; Solomon 1983). This need for uniqueness is defined as “an individual’s pursuit of differentness relative to others that is achieved through the acquisition, utilization, and disposition of consumer goods for the purpose of developing and enhancing one’s personal and social identity” (Tian, Bearden, and Hunter 2001, 50). Such pursuit of differentness is the basis for uniqueness theory (Fromkin 1970), which argues that consumers respond aversely to threats to their uniqueness and individuality. Overall, consumers have to balance their needs to be similar and to be different (Brewer 1991; Hornsey and Jetten 2004).

Threats to uniqueness should raise consumers' preference for scarce experiences (Fromkin 1970), and consumers who value uniqueness more should be more attracted towards scarce products than consumers who value uniqueness less (Lynn 1991; Snyder 1992). Individual differences in consumers' need for uniqueness (NFU) may thus moderate the influence of product scarcity on product preference although empirical results are limited and inconsistent (Lynn and Harris 1997). Yet, NFU may not always stimulate preferences for scarce products. Even though the effect seems uncontroversial for supply-caused scarcity, it is *not* for demand-caused scarcity. After all, when scarcity is due to excess demand the product is not exclusive at all because others have already bought it. Preference for such a product, we argue, relies on a different mechanism: the product's popularity signals its superiority to alternative products and stimulates its purchase. There is no reason to assume that consumers with a high NFU are more attracted towards this product than consumers with a low NFU. It is also unlikely that consumers with a high NFU will automatically reject the product due to its popularity, especially not when they are uncertain about product quality. The excess demand shows that others think that the product is superior, and even consumers with a high NFU will probably take this information into account. Although they want to be unique, they probably also want to avoid buying an inferior product, and they are therefore likely to follow the preferences of others when they are uncertain about product quality. We hypothesize that:

H3: Need for uniqueness increases the preference for a product when its scarcity is due to limited supply, but does not influence the effect of product scarcity due to excess demand.

Although a high NFU may not lead consumers to reject a product with excess demand, there may be situations in which consumers dislike a product's popularity enough to overcome its

presumably higher quality, which we explore next. Excess demand implies that others have bought the product, which is important information for social comparisons, and which can have a negative effect on consumer preferences.

Social comparison information can sometimes be threatening to the self (Argo, White, and Dahl 2006; Brickman and Bulman 1977). Because product purchase and consumption are important ways in which consumers create their personal identity (Belk 1988; Richins 1994), the ownership of superior products by relevant others can have negative self-evaluative consequences (Tesser, Millar, and Moore 1988). Interestingly, the ownership of identical products may have negative self-evaluative consequences as well. Although consumers want to be *similar* to others, they do not want to be *identical* to them (Brewer 1991; Brickman and Bulman 1977). Because it undermines the distinctiveness of the self from others, owning the exact same product as relevant others can threaten a consumer's identity (Fromkin 1970; Snyder 1992). Hence, consumers may reject products that are possessed by others.

Comparisons with similar others are generally more meaningful than comparisons with divergent others, and comparison effects are therefore usually larger when the comparison target is relevant or psychologically close (Argo et al. 2006; Childers and Rao 1992; Pelham and Wachsmuth 1995). Consumers should thus feel more threatened when close others own the same product than when more distant others, outside of their immediate social circle, own this product. Importantly, the threat that relevant others may own an identical product is pertinent to demand-caused but not to supply-caused scarcity. When consumers believe that relevant others, rather than more distant or unknown others, had the opportunity to buy a product that is now scarce due to excess demand, they may avoid choosing this scarce product. This threat to the consumer's sense of uniqueness undermines, and potentially reverses, the bandwagon effect. In the case of

supply-caused scarcity, the limited supply of the valued product restricts the potential threat to the consumer's identity, even when relevant others have had the possibility to buy it. Hence, we hypothesize:

H4: Possible ownership by relevant others decreases the preference for a scarce product when scarcity is due to excess demand, but does not influence the effect of product scarcity due to limited supply.

Combined support for these hypotheses would show (1) that both excess demand and limited supply influence product preference, (2) that the mechanisms of these effects differ, as evidenced by a different response to trait (NFU) and state (ownership by relevant others) factors that reflect the consumer's need to be unique, and (3) when scarcity can actually decrease preference. Then, rather than uniformly raising preferences for products, the occurrence of bandwagon and snob effects due to scarcity would be contingent on consumers' chronic and temporary needs to be unique. This is likely to hold across many product categories, as long as several conditions are met. Scarcity provides useful information to consumers when choices are complex and involving, and consumers are uncertain about the qualities of competing products. Furthermore, product ownership by other consumers matters when this is visible and relevant, that is, when products are publicly consumed and important for identity communication. Two experiments consequently test the hypotheses under these conditions.

EXPERIMENT 1: SCARCITY AND NEED FOR UNIQUENESS

This experiment examines demand and supply sources of scarcity, as well as the moderating influence of NFU, testing hypotheses 1, 2, and 3. We expect that NFU increases preference for

scarcity due to limited supply, but not for scarcity due to excess demand.

Method

Participants and design. Wine was chosen as the product category, because scarcity is especially informative in complex and involving choice situations with high quality ambiguity and incomplete brand preferences, for which reason wine has also been selected in previous research (Lynn 1989). Participants were screened on wine involvement and only participants with a moderate or high involvement (measured on a three-item scale) were selected in the experiment. Consequently, 115 students were randomly assigned to a situation with demand-caused or supply-caused scarcity and evaluated both a scarce and a non-scarce wine. The design was a 2 (scarcity cause: demand vs. supply) \times 2 (scarcity: scarce vs. non-scarce product) mixed design, with repeated measures on the second factor.

Procedure. The experiment was administered on personal computers using the program authorware (Kellogg and Bhatnagar 2002). The cause of scarcity was manipulated by referring to excess demand or limited supply in the introductory text. In the demand-caused scarcity condition, participants ($N = 59$) read the following instruction:

Imagine: you want to cook an Italian meal this evening. This calls for an Italian wine. You go to the wine store to buy one. The store is full of customers. You ask an employee for help, and he shows you two Italian wines that meet your demands. He explains that the inventory level of one is low, because this wine is in demand and he has sold several.

In the supply-caused condition, participants ($N = 56$) read a similar instruction, in which no other customers were in the store and the instruction indicated that an employee explained the low inventory as “it is difficult to obtain this wine because the inventory of small wine growers is low.” Then, participants viewed a picture of a shelf with two wines, one fully stocked (six facings with a second row of bottles visible behind the first) and one not fully stocked (two facings with a second row visible behind the first), as shown in figure 1. Prices were indicated and identical for both products, as recommended by Lynn (1992). Additional information about the wines concerned the type of grape (Sangiovese or Verdicchio), aroma (classical aroma or pleasant aroma), experience (splendid tension arch or playful with pleasant tannins), and taste (full taste or round taste). These were derived from actual wine descriptions and pretested to provide equally attractive and general information. Order of products on the shelf and all information about the wines was randomized across participants.

Insert figure 1 about here

Measures. Participants chose one of the two wines. For both products, they also responded to semantic differential items on nine-point scales, about product popularity (two items: ‘not popular – popular’ and ‘not sought after – sought after’, average $\alpha = .81$), exclusiveness (three items: ‘not exclusive – exclusive’, ‘normal – special’, and ‘not unique – unique’, average $\alpha = .90$), and preference (three items: ‘would not like to try – would like to try’, ‘not for me – for me’, and ‘do not want to buy – want to buy’, average $\alpha = .79$).

Six items assessed need for uniqueness, based on the first NFU dimension identified by Tian

et al. (2001), ‘creative choice counterconformity’, which is most relevant here. A high score on this dimension indicates a desire to buy products that are approved by others, but cannot be obtained by all, which is exactly when a snob effect is expected to occur. The items were: ‘I have sometimes purchased an unusual product or brand as a way to create a distinctive personal image’, ‘I often look for one-of-a-kind products, so that I can create a style that is all my own’, ‘When buying merchandise, it is important for me to find something that communicates my uniqueness’, ‘The products and brands that I like best are the ones that express my individuality’, ‘I often try to find a more interesting version of regular products, because I enjoy being original’, and ‘I’m often on the lookout for new products or brands that will add to my personal uniqueness’ ($\alpha = .89$). Participants completed the experiment in 10 minutes on average and received a snack product for their participation.

Results and discussion

Inferences of popularity and exclusiveness. Table 1 provides means and standard deviations. Participants indeed evaluated the scarce product to be more popular compared with the alternative product when scarcity was caused by excess demand than when it was caused by limited supply, as shown by the significant scarcity \times scarcity cause interaction ($F(1, 113) = 12.4; p < .01, \eta_p^2 = .10$). This supports hypothesis 1. Furthermore, in support of hypothesis 2, the perceived exclusiveness of the scarce product compared with the non-scarce product also depended on the cause of scarcity ($F(1, 113) = 18.7, p < .001, \eta_p^2 = .14$): the scarce product was perceived to be more exclusive than the non-scarce product when scarcity was due to limited supply ($M_{\text{scarce}} = 6.34$ and $M_{\text{non-scarce}} = 4.24; F(1, 55) = 43.1, p < .001, \eta_p^2 = .44$), not when

scarcity was due to excess demand ($F(1, 58) = 0.2, NS$).

Insert table 1 about here

Product preference and propensity to choose the scarce product. More importantly, preference for the scarce product exceeded preference for the non-scarce product ($M_{\text{scarce}} = 6.63$ and $M_{\text{non-scarce}} = 6.12$; $F(1, 113) = 8.2, p < .01, \eta_p^2 = .07$). The interaction with the cause of scarcity was not significant ($F(1, 113) = 2.1, NS$), which is as expected. Thus, irrespective of whether scarcity was caused by excess demand or limited supply, the scarce product was preferred over the non-scarce product. In addition, 78 participants of 115 in the sample (67.8%) chose the scarce product, which was more than if choice would have been random (binomial test, $Z = 3.8, p < .001$).

Next, NFU was included in the model, to test its moderating influence. Hypothesis 3 specified that NFU increases preference for the scarce product for supply-caused scarcity, but not for demand-caused scarcity, and this is what we found. The three-way interaction of scarcity, cause of scarcity, and the NFU scale was significant ($F(1, 111) = 4.0, p < .05$). Further and as expected, NFU was a moderator for the limited supply condition ($F(1, 54) = 7.0, p < .05, \eta_p^2 = .11$), but not for the excess demand condition ($F(1, 57) = 0.2, NS$). Figure 2 provides a graphical illustration of the interaction effect. It shows that the scarce product is consistently preferred in the excess demand condition, regardless of the level of NFU, but not in the limited supply condition. When scarcity is caused by limited supply, consumers with a higher NFU show a preference for the scarce product, whereas consumers with a lower NFU do not.

Insert figure 2 about here

In sum, both demand and supply sources of scarcity were shown to increase product choice. Yet, the consumers' inferences differ between the two causes, with inferences of popularity for excess demand and inferences of exclusiveness for limited supply. Individual differences in need for uniqueness only moderated the effect of scarcity due to limited supply, where product preferences are higher for consumers with a high NFU than for consumers with a low NFU. The absence of this effect of NFU for scarcity due to excess demand corroborates our distinction between the two scarcity mechanisms.

EXPERIMENT 2: SCARCITY AND PURCHASES OF RELEVANT OTHERS

Experiment 1 shows that demand-caused and supply-caused scarcity can both increase product preference and choice, and that the need to be unique moderates the scarcity effects of supply-caused scarcity. This second experiment examines a specific situation in which the need to be unique is actually expected to *decrease* preference and choice. It tests hypothesis 4, which predicts that the possible ownership of the scarce product by relevant others reverses the scarcity effect due to excess demand. We chose the product category of shirts for this experiment, because clothing is important in expressing a person's identity and is consumed socially (Davis 1985; Solomon 1983). Except in highly regulated situations (school uniforms, team sport clothing), encountering someone with an identical product threatens one's sense of uniqueness

and is therefore generally undesirable in this category.

Method

Participants and design. Two hundred undergraduate students participated in a 2 (scarcity cause: demand vs. supply) \times 2 (store location: nearby vs. distant) \times 2 (scarcity: scarce vs. non-scarce product) mixed design with repeated measures on the third factor.

Procedure. Participants read a description of a visit to a clothing store, where they needed to choose between two shirts, one of which was scarce. The possibility of ownership by relevant others was manipulated by either locating the store in the students' university town (a small town with few clothing stores aimed at students) or another university town at the other side of the country. Cause of scarcity was manipulated by having a salesperson mention excess demand or limited supply for the minimal inventory level. The instruction was:

Imagine: you are visiting a clothing store in [name of the university's home town vs. a distant town] to buy a shirt. Because the store is [familiar vs. unfamiliar] among local students, you have [regularly vs. almost never] seen students wearing the clothes that are sold here. You notice two nice shirts in the clothing store. Of one shirt there are only two items in the rack, whereas there are plenty of items of the other shirt. The shirts have the same price, but differ in material and design. Both shirts suit you. The saleswoman tells you that the store has so few of the one shirt because [this shirt was produced in low quantities vs. this shirt has been sold a lot].

Measures. Participants indicated which shirt they would buy, and responded to semantic differentials on product popularity (two items), exclusiveness (three items), and preference (two items; all items similar to those used in experiment 1).

Results and discussion

Inferences of popularity and exclusiveness. Table 2 provides means and standard deviations. In support of hypothesis 1, inferences of popularity depended on the cause of scarcity ($F(1, 196) = 128.1; p < .001, \eta_p^2 = .40$): participants inferred that the scarce product was more popular than the non-scarce product for demand-caused scarcity ($M_{\text{scarce}} = 7.64$ and $M_{\text{non-scarce}} = 3.58; F(1, 95) = 462.5, p < .001, \eta_p^2 = .83$) but not for supply-caused scarcity ($F(1, 101) = 0.4, \text{NS}$). Store location did not affect inferences of popularity ($F(1, 196) = 1.0, \text{NS}$), indicating that participants perceived excess demand as a sign of popularity, irrespective of whether this demand came from their peers or from more distant and unknown others.

Inferences of exclusiveness also depended on the cause of scarcity ($F(1, 196) = 245.7; p < .001, \eta_p^2 = .56$), with participants inferring that the scarce product was more exclusive than the non-scarce product for supply-caused scarcity ($M_{\text{scarce}} = 6.56$ and $M_{\text{non-scarce}} = 3.53; F(1, 101) = 204.2, p < .001, \eta_p^2 = .67$), but inferring that the scarcity product was *less* exclusive than the non-scarce product for demand-caused scarcity ($M_{\text{scarce}} = 3.33$ and $M_{\text{non-scarce}} = 4.95; F(1, 95) = 62.4, p < .001, \eta_p^2 = .40$). Hence, inferences differed depending on the cause of scarcity, thereby showing the operation of two distinct scarcity mechanisms. Store location also affected inferences of exclusiveness ($F(1, 196) = 7.8, p < .01, \eta_p^2 = .04$): in the nearby store, the scarce product was seen as less exclusive than in the distant store.

Insert table 2 about here

Product preference and propensity to choose the scarce product. Importantly and as we hypothesized, participants' preference for the scarce product compared with the non-scarce product depended on the interaction between the cause of scarcity and store location (three-way interaction, scarcity \times scarcity cause \times store location; $F(1, 196) = 4.8, p < .05$). For supply-caused scarcity, participants had a preference for the scarce product ($M_{\text{scarce}} = 6.38$ and $M_{\text{non-scarce}} = 4.87$; $F(1, 101) = 43.1, p < .001, \eta_p^2 = .30$), irrespective of store location ($F(1, 101) = 0.2, \text{NS}$). For demand-caused scarcity, however, preference for the scarce product depended on store location ($F(1, 95) = 9.5, p < .01$). Participants appeared indifferent between the scarce and non-scarce product in the distant store ($F(1, 52) = 0.4, \text{NS}$), but disliked the scarce product in the nearby store ($M_{\text{scarce}} = 4.43$ and $M_{\text{non-scarce}} = 6.50$; $F(1, 43) = 21.7, p < .001, \eta_p^2 = .34$). In other words, the possible ownership by relevant others of the same product (because of the nearby store) decreased the attractiveness of the scarce product, when scarcity was caused by excess demand, but not when it was caused by limited supply. This reveals how the two proposed scarcity mechanisms differ. Figure 3 provides a graphical illustration.

Insert figure 3 about here

Overall, 117 participants of 200 in the sample (58.5%) choose the scarce product, which is more

than expected if choice would have been random (binomial test, $Z = 2.4$, $p < .05$). As expected, the number of participants who chose the scarce product depended on the cause of scarcity and store location. For supply-caused scarcity, 86.4% choose the scarce product, and store location did not matter ($\chi^2(1, n = 103) = 0.7$, NS). For demand-caused scarcity, however, more participants choose the scarce product in the *distant* store (45.3%) than in the nearby store (9.1%; $\chi^2(1, n = 97) = 15.3$, $p < .001$). A logistic regression, in which choice of the scarce product was predicted from the cause of scarcity, store location, and the interaction between these two factors, gave similar results with both a significant main effect for the cause of scarcity ($\beta = -2.29$, Wald = 19.9, $p < .001$) and a significant interaction effect ($\beta = -1.62$, Wald = 3.8, $p = .05$). Thus, in line with our predictions, the possible ownership by relevant others decreased rather than increased product choice when scarcity was caused by excess demand.

GENERAL DISCUSSION

The present research clearly shows that, contrary to commonly held beliefs, products are not universally valued to the extent that they are unavailable. Our studies revealed that scarcity operates through two distinct mechanisms, depending on whether scarcity is caused by limited supply or excess demand. Bandwagon effects emerge when scarcity due to excess demand signals product popularity which raises product preferences, and snob effects emerge when scarcity due to limited supply signals product exclusivity which raises product preferences. When the need to be unique is activated, either chronically or situationally, product scarcity due to excess demand may actually boomerang, and lead to reduced preferences instead. These findings provide new insights into the influence of product scarcity on consumer preference

formation and choice, and they extend commodity theory. They reveal how demand-caused scarcity operates through a distinctly different mechanism than supply-caused scarcity does. Including demand-caused scarcity and the corresponding mechanism into commodity theory allows this theory to more accurately describe consumer behavior, and, perhaps more importantly, allows predictions of when consumers avoid scarce products.

There is a relative absence of research on the effects of demand-caused scarcity, with prior research almost uniquely emphasizing supply restrictions, which is surprising given the omnipresence of scarcity resulting from excess demand. When others already own a product, this can provide a basis for a bandwagon effect, because consumers see a potential for uncertainty reduction and self-improvement by following these others. This effect holds as long as the personal identity of the consumer is not threatened. When an identity threat is triggered, as commonly occurs, consumers actively avoid the bandwagon, and increased popularity backfires. An indication of the behavior of unspecified other consumers suffices to set this mechanism into action, as the present findings reveal.

This research has shown that both traits and state factors can influence the operation of the distinct scarcity mechanisms. This influence is selective, which is desirable because only one of the scarcity mechanisms is affected but the other is not, showing the distinctiveness of the mechanisms. Furthermore, the present findings are the first, to our knowledge, to demonstrate a preference reversal due to scarcity, in a context that is common. When scarcity is due to excess demand and the consumers' individuality is at risk, because relevant others may have bought the scarce product, consumers avoid choosing this scarce product. This impact is such that, in the situation where relevant others visit the same store, experiment 2 shows sheer dislike for the scarce product (chosen by fewer than 10% of participants) or immense favor (chosen by more

than 80%) depending on whether consumers think that scarcity is caused by excess demand or limited supply. These preference reversals are reliable, and they open avenues for future research on the social embeddedness of consumer choice, even in the absence of others, when only the consequences of their past behavior remain as empty space on the shelf.

EXTENDING COMMODITY THEORY

The inclusion of demand-caused scarcity importantly extends commodity theory, but the present research suggests opportunities for other extensions as well. It focused on uniqueness, revealing that a high intrinsic need for uniqueness increases the preference for a product in limited supply (experiment 1) and that an extrinsic threat to uniqueness decreases the preference for a product in excess demand (experiment 2). Mirroring this, situations activating a need for conformity are likely to increase the preference for a product in excess demand, or decrease the preference for a product in limited supply, and future research may test these speculations.

Our research examined two product categories, wines and clothes, because product quality is difficult to ascertain and consumption is social in these categories, increasing the importance of exclusiveness and popularity considerations. The findings are likely to generalize to other products and services with similar consumption situations and quality ambiguities, such as concert tickets, jewelry, and perfumes. Yet, scarcity effects may be different for other settings. For example, when consumption is private, snob effects are less likely to occur, and when products are used to facilitate social inclusion or signal group membership (e.g., in sports teams or choirs), consumers appreciate the ownership of products that are identical to those owned by others. Additionally, possible ownership by relevant others only reverse scarcity effects for

products that are important for the consumers' identity. When owning the exact identical product as others is non-threatening, bandwagon effects are likely to persist, and future research may examine this.

Future research could also examine price expectations of consumers, or responses to product scarcity when alternatives have different prices. Because exclusive products are generally associated with higher prices, scarcity caused by supply limitations should increase price expectations. Scarcity caused by excess demand may, on the contrary, indicate mass production and low or discount prices. When such discount prices are indeed provided, product scarcity may accentuate them, promoting inferences of having made a 'good deal'. Hence, scarcity tactics may not only increase choice of exclusive products in a limited supply context, but they may also increase choice of discount products in an excess demand context.

In conclusion, the present research extends commodity theory, by revealing the effects of product scarcity due to different causes on consumers' inferences, preferences and choice. The attraction of scarce products comes from two markedly different mechanisms: popularity for demand-caused scarcity and exclusiveness for supply-caused scarcity. In addition, scarcity due to excess demand may actually backfire and reduce product preferences if the need to be unique is activated. In this way, we have shown when less sells more and when it does not.

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TABLE 1
 MEAN INFERENCES OF POPULARITY AND EXCLUSIVENESS, PRODUCT
 PREFERENCE, AND CHOICE FOR SCARCE AND NON-SCARCE PRODUCTS AS A
 FUNCTION OF THE REASON FOR SCARCITY, EXPERIMENT 1

Dependent variable		Reason for scarcity	
		Excess demand (<i>n</i> = 59)	Limited supply (<i>n</i> = 56)
Popularity	Scarce product	7.19 (1.31)	6.47 (1.28)
	Non-scarce product	4.25 (2.05)	5.30 (1.69)
Exclusiveness	Scarce product	4.44 (1.83)	6.33 (1.51)
	Non-scarce product	4.29 (1.65)	4.24 (1.59)
Preference	Scarce product	6.69 (1.29)	6.58 (1.16)
	Non-scarce product	5.93 (1.39)	6.33 (1.20)
Choice ^a	Scarce product	44	34
	Non-scarce product	15	22

Note. Means on 9-point scales with standard deviations in parentheses.

^aNumber of participants.

TABLE 2
 MEAN INFERENCES OF POPULARITY AND EXCLUSIVENESS, PRODUCT
 PREFERENCE AND CHOICE FOR SCARCE AND NON-SCARCE PRODUCTS AS A
 FUNCTION OF THE REASON FOR SCARCITY, EXPERIMENT 2

Dependent variable	Reason for scarcity			
	Excess demand		Limited supply	
	Nearby store (<i>n</i> = 44)	Distant store (<i>n</i> = 53)	Nearby store (<i>n</i> = 48)	Distant store (<i>n</i> = 55)
Popularity				
Scarce product	7.78 (1.08)	7.52 (0.94)	6.13 (1.70)	5.75 (1.57)
Non-scarce product	3.59 (1.25)	3.58 (1.42)	5.73 (1.71)	5.79 (1.84)
Exclusiveness				
Scarce product	2.98 (1.38)	3.62 (1.32)	6.19 (1.75)	6.87 (1.16)
Non-scarce product	5.08 (1.93)	4.84 (1.74)	3.60 (1.34)	3.48 (1.30)
Preference				
Scarce product	4.43 (2.10)	5.49 (1.86)	6.24 (1.52)	6.50 (1.46)
Non-scarce product	6.50 (1.57)	5.73 (1.97)	4.84 (1.90)	4.90 (1.52)
Choice ^a				
Scarce product	4	24	40	49
Non-scarce product	40	29	8	6

Note. Means on 9-point scales with standard deviations in parentheses.

^a Number of participants.

FIGURE 1

SCREEN DUMP OF THE STIMULUS MATERIAL USED IN EXPERIMENT 1



FIGURE 2

PRODUCT PREFERENCE ACROSS DIFFERENT LEVELS OF NEED FOR UNIQUENESS,
EXPERIMENT 1

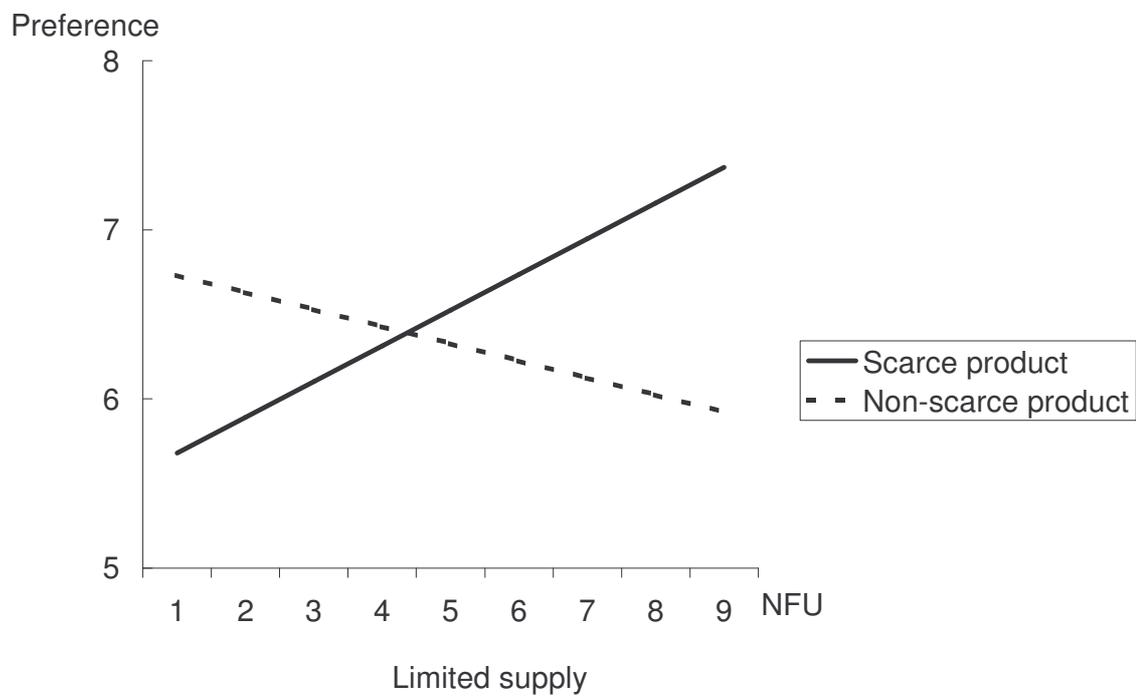
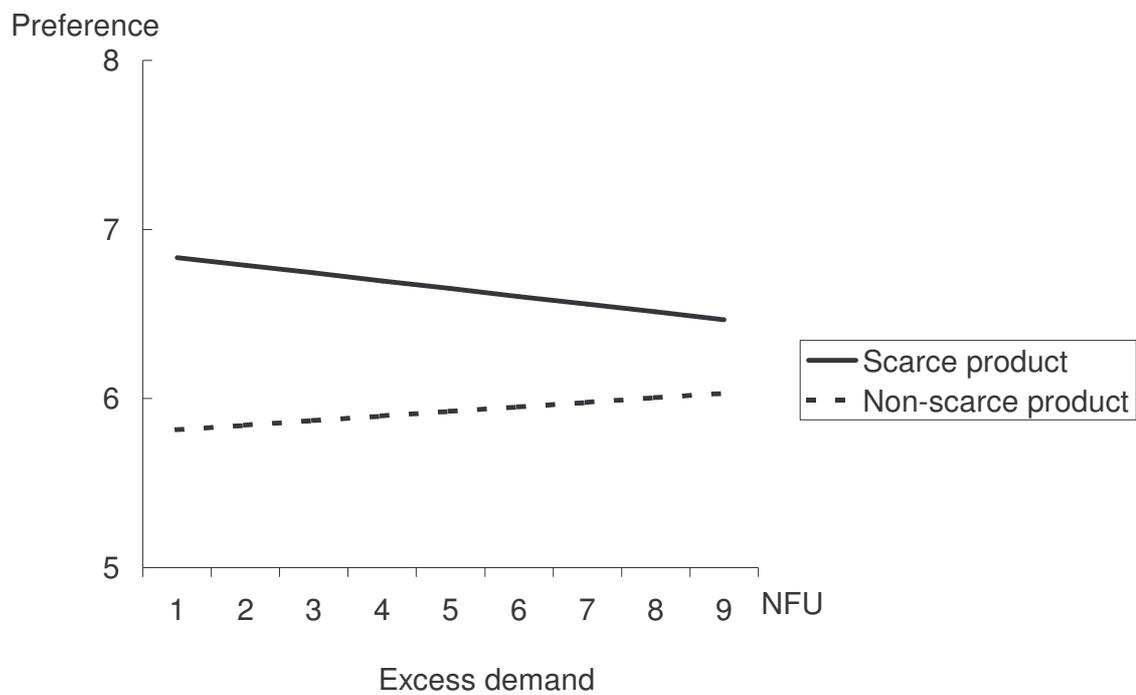
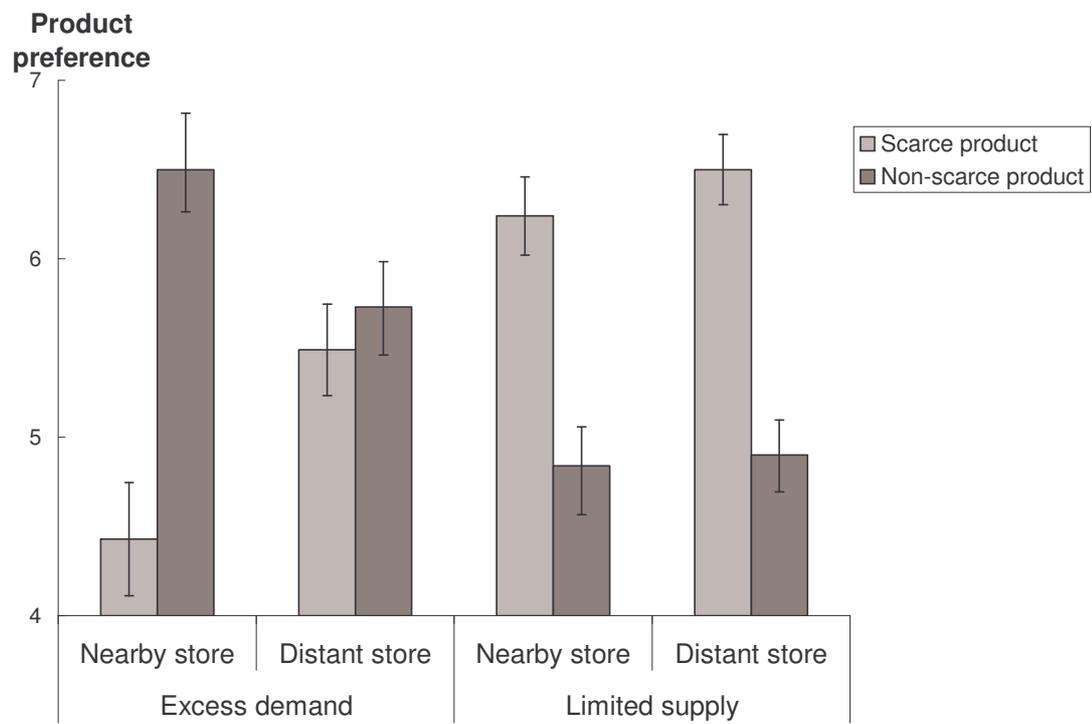


FIGURE 3

PRODUCT PREFERENCE IN NEARBY AND DISTANT STORE, EXPERIMENT 2



Note. Error bars are +/- one SE of the mean.