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How Scarcity Frames Value

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In behavioral science, much attention is given to the ways that decisions are malleable. Here, we discuss how scarcity leads people to make more consistent judgments and decisions. Several studies demonstrate that participants experiencing various forms of scarcity are less susceptible to different context or framing effects.

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Why Having So Little Means So Much: Scarcity Shapes Consumer Decision Making

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SESSION OVERVIEW

As a pervasive aspect of human life (Booth 1984), a fundamental concept in economics (Brock 1968), and one of the most powerful instruments of influence in our society (Cialdini 2009), scarcity has attracted attention from various disciplines. Researchers have made considerable progress in understanding how scarcity of a single object enhances perceived value and demand (Brock 1968; Verhallen and Robben 1994). More recently, consumer researchers have expanded the scope beyond object specific scarcity to general perception of resource scarcity exploring situational activated scarcity (Laran and Salerno 2012; Shah, Shafir and Mullaninathan 2012) and individual differences in resource availability (Griskevicius et al. 2013). Yet, our understanding of the psychological and behavioral consequences of scarcity remains limited.

The proposed session highlights the newest research on how scarcity shapes consumers' value construction, product preferences, and daily decisions using a diverse range of theoretical frameworks, methods, and measures. In an attempt to gain better understanding of the interplay between resource scarcity and consumer behaviors, the papers examine how consumers' tradeoff, substitution, purchase, and financial decisions are influenced by experimentally-induced as well as real-life scarcity.

Zhu and Ratner examine how a uniform level of scarcity across items in a choice set impacts choices of individual items in the set. They show that overall perception of scarcity versus abundance increases arousal level, polarizes the evaluations of individual items contained in the choice set, and consequently increases (decreases) choices of the favorite (non-favorites). **Shah, Shafir and Mullainathan** argue that scarcity captures attention, makes tradeoffs more accessible and therefore makes valuation more consistent. They demonstrate that participants experiencing various forms of scarcity (including monetary, caloric, and experimentally induced time scarcity) are less susceptible to different context or framing effects. **Thompson, Hamilton and Banerji** examine the effects of perceived childhood socioeconomic status (SES) on substitution behavior. Whereas previous research indicates that experiencing childhood scarcity can make consumers more impulsive, this paper argues that when making substitution decisions, consumers with low (vs. high) childhood SES will exhibit more patience. When the waited-for item becomes unavailable, however, the low childhood SES participants devalue it, making it easier to choose a substitute. Finally, **Mittal and Griskevicius** demonstrate that resource scarcity produces divergent control beliefs and impulsive behaviors in people as a function of their childhood environments. They hypothesize and provide evidence that resource scarcity leads individuals from relatively poorer childhood backgrounds to feel that they have less personal control, which facilitates preference for smaller sooner rewards.

Taken together, the four papers (all in advanced stages) in this session elucidate the nuanced relationship between scarcity and consumer decision making, noting when and why resource scarcity may lead to suboptimal decisions versus more fruitful behaviors. As the session integrates diverse research to highlight newest theoretical developments in this important yet understudied area, it is expected to appeal to a broad audience, including those interested in scarcity, variety seeking and compensatory choices, self-control and impulsivity, social welfare, and consumer judgment and decision making. Talks will be kept brief to allow time for audience interaction.

The Impact of Scarcity on Consumers' Choices of Multiple Items from a Product Class

EXTENDED ABSTRACT

Consumers often confront abundance or scarcity of items in a choice set. A grocery store can present large or small quantities of each type of fruit and vegetable, a clothing store can display large or small baskets of accessories, and governments can describe natural resources such as national parks as abundant or scarce. How does the degree of overall perceived scarcity of items within a choice set impact what items the consumer selects?

In spite of a rich body of literature on how scarcity of a single item enhances valuation of the specific item (Brock 1968; Verhallen and Robben 1994), how an overall level of scarcity across items from a product class affects the evaluation and choice of individual items in the choice set remains an intriguing, uninvestigated question. We build our theoretical framework based on two separate streams of research. First, it has been suggested that scarcity induces arousal (Brehm 1966; Berlyne 1969; Cialdini 2009). Second, arousal has been shown to alter attention allocation (Broadbent 1971; Easterbrook 1959; Kahneman 1973) giving rise to judgment polarization (Mano 1992; Paulhus and Lim 1994). Building upon this literature, we theorize that scarcity of multiple items from a product class induces arousal, and that the heightened arousal polarizes the evaluations of individual items contained in the choice set, consequently increasing (decreasing) choices of the most-preferred (less-preferred) items.

The objective of Study 1 is to provide support for our main thesis that scarce (vs. abundant) supply of each alternative in a choice set polarizes the liking for the favorite versus non-favorites, and increases choices of the favorite item from the set. Participants were asked to imagine that they were shopping at a grocery shop and decided to buy four yogurts as there was a "Pick Any 4 for $1" sale. They were told that the store carries a total of five different yogurt flavors including strawberry, raspberry, vanilla, peach and lemon. Participants in the abundant (scarcity) condition were told that there were many (only a few) of each flavor, approximately 50 units (5

units) of each remaining. All participants were then asked to rank the five yogurt flavors according to their preference, rate how much they like each flavor, and finally indicate which four yogurts they would choose. As predicted, we find that scarce (vs. abundant) supply of each alternative in the choice set polarized liking of the favorite versus non-favorites, and led people to select more units of their favorite item from the set.

To examine whether the mere perception of scarcity is sufficient to trigger these effects, in Study 2, participants were presented with pictures of four types of ready-to-eat vegetables. In the scarcity (abundance) condition, eight pieces of vegetables of each type were provided in four transparent large, 32 oz. (small, 8 oz.) food containers. A separate manipulation check confirmed that participants perceived the same supply level of vegetables as more limited when it was provided in the large versus small food containers. Results of Study 2 provide converging evidence for our key proposition, demonstrating that perceived (instead of actual) scarce versus abundant supply also polarized liking ratings and increased choices of the favorite. Further, in Study 2 we added popularity measures to investigate the alternative explanation of perceived popularity, and found that neither absolute nor relative popularity of the favorite was significantly different across the scarcity and abundance conditions.

We subsequently present two additional experiments to provide direct support for the arousal-based theorizing, demonstrating that the effect of scarcity versus abundance on choices between the most and less-preferred alternatives is mediated by reported arousal level (Study 3) and attenuated by experimentally induced arousal state (Study 4). In Study 3, participants were asked to pick four $25 gifts cards from five different stores, and they were told that three participants in this study would be randomly selected to receive the four $25 gift cards picked by them (total worth $100). Consistent with our theorizing, scarcity increased choices of the favorite store's gift card and the effect of supply level on gift card choices was mediated by reported arousal level. In Study 4, based on previous arousal research (Menon and Kahn 2002, Vosgerau 2010) showing that bright background color induces high-level of arousal, we manipulated a second factor, survey background color (arousing vs. control), in addition to supply level. Replicating previous results in another real choice context, subjects in the control conditions chose more pieces of their favorite candy in the scarcity versus abundance condition. Importantly, experimentally activating a high-arousal state for all participants through the bright background color eliminated the effects of the scarcity versus abundance condition on the number of pieces chosen of their favorite. Finally, Study 5 generalizes the proposed polarization effect to situations where a general sense of scarcity is activated. We find that activating the general concept of scarcity using a lexical decision task manipulation (Laran and Salerno 2012) also increased choices of the favorite item from a choice set.

To summarize, whereas prior research focused on how the scarcity of a single item impacts its attractiveness, here we examine how overall perception of scarcity across multiple items from a choice set influences choices of individual items in the set. We demonstrate that a uniform level of scarcity (vs. abundance) across items in a choice set increases choices of the most-preferred item, decreasing choices of the less-preferred items. We propose and find empirical support for an arousal-based polarization explanation.

How Scarcity Frames Value

EXTENDED ABSTRACT

Value is hard to determine. Rarely can we name an immediate price for a weekend getaway or the value of a beer on a hot summer day. So we construct value from context. Our decisions might change based on which mental accounts are accessible (Thaler, 1999) or how a question is framed (Tversky & Kahneman, 1981). Indeed, much of behavioral science has been concerned with the features of the environment that introduce malleability into how we make judgments and decisions.

But here we consider how resource scarcity can frame decisions in a more stable way. We suggest that under scarcity, pressing needs capture attention (Shah, Mullainathan, Shafir, 2012). As a result, things like a utility bill or rent payment or other needs are often top-of-mind. These thoughts make tradeoffs very accessible—buying one thing means giving up another. These tradeoffs provide an internal frame of reference that more steadily guides our perception of value. As a result, valuations under scarcity are less subject to irrelevant contextual features and are instead based on these consistent, accessible tradeoffs. Across six studies, we show that scarcity makes tradeoffs more accessible and therefore makes valuation more consistent. This seems true for monetary scarcity, caloric scarcity, and experimentally induced time scarcity.

In Study 1a (N=103), participants saw a classic scenario where they named their willingness to pay for a beer that was either purchased from a convenience store or a fancy hotel (Thaler, 1985). Participants typically offer a higher price for the beer from the hotel than convenience store because the contexts have different reference prices. In this study, participants were simply asked to describe what they would think about as they came up with their willingness-to-pay. Wealthier participants were more likely to say that they would think about where the beer was being purchased (i.e., context). Poorer participants were more likely to say that they would think about items they could not buy if they bought the beer (i.e., tradeoffs). In Study 1b (N=151) participants named their willingness-to-pay. Wealthier participants replicated the classic effect, offering a higher price for the beer from the hotel. But poorer participants were less swayed by this feature of the context, instead naming prices that were nearly equivalent across both frames. In Studies 1c and 1d we replicated these results on a larger sample from the same population (N=604) and on a large, nationally representative sample (N=2015).

In Study 2a (N=705), we tested a classic demonstration of "proportional thinking" (Tversky & Kahneman, 1981). Participants indicated whether they would be willing to travel 30 minutes to save $50 on a tablet computer. The tablet was priced at $300, $500, or $1000. People are usually more willing to travel for the discount when the tablet is cheaper (i.e., a higher proportional discount). That is, to get a sense of whether $50 is worth 30 minutes, people look to the total cost. But we expected that poorer participants would value the discount more consistently. Indeed, higher-income participants were more willing to travel when the discount was proportionally larger, but lower-income participants were less sensitive to the proportional size of the discount. In Study 2b, we directly replicated these results on the nationally representative sample from Study 1d.

In Study 3 (N = 505), participants rated the attractiveness of one of two lotteries. One lottery simply offered a chance to win $9 (otherwise nothing). Another lottery offered the same chance of winning $9 (otherwise lose 25 cents). People typically rate the latter lottery as more attractive (even though it is dominated) because the small loss makes it easier to evaluate the worth of $9 (Slovic et al., 2002). Here, this effect holds for the rich, but not for the poor. Again, the poor have a more stable representation of value. In Study 4 (N=263), participants considered small accounts (i.e., cash in their wallet) or large accounts (i.e., money in the bank) and then rated the expensiveness of a consumer product. Typically, participants rate the product as less expensive if they have been primed to think of

the large account (Morewedge et al., 2007). This again holds for wealthier participants, but not poorer participants.

We conceptually replicated these results with different forms of scarcity in Studies 5 and 6. In Study 5 (*N*=234), dieters (those experiencing caloric scarcity) and non-dieters considered small or large caloric accounts (how many calories they consume in a day or a week) and then judged how fattening a large order of French fries felt. Non-dieters judged the fries to be less fattening when primed with a large account, but dieters provided more consistent evaluations across contexts. Finally, in Study 6 (*N*=74), we manipulated time scarcity (as in Shah et al., 2012). Participants played a game in which they were given a small time-budget (poor participants) or a large one (rich participants). Afterward, they were primed to think of a small account (time per round) or a large account (time for the whole game). Then, they were asked to imagine losing 10 seconds from a round of the game and to rate how costly that loss would feel. Time-rich participants rated the loss as less costly when primed with the large account, but time-poor participants provided more consistent evaluations across contexts.

Taken together, these studies suggest that scarcity indeed frames problems in a more stable way. These studies have the promise to resolve lingering questions in psychology and economics. Economics makes many predictions about how preferences should unfold, while behavioral science has identified several ways in which those predictions break down. But economics makes those predictions because it assumes that people regularly recognize scarcity in the world and consider the tradeoffs that it imposes. But when we experience slack, those tradeoffs recede from attention, and we can only look to the environment for guidance on what things are worth. However, it may be the case that when scarcity becomes a psychological reality, we create a context which we carry with us and which more steadily frames our perspective.

You Can't Always Get What You Want: The Effect of Childhood Scarcity on Substitution Decisions

EXTENDED ABSTRACT

One issue all consumers occasionally face is choosing a replacement for an alternative that becomes unavailable, is too expensive or is restricted in some other way (Hamilton et al. 2014). Moreover, consumers with fewer resources may be forced to forgo desired alternatives more frequently than those with more resources. Thus, consumers with fewer resources may get more practice making substitutions than consumers with more resources, potentially changing their cognitive and emotional responses when access to desired alternatives is restricted. This could be considered adaptive if the cognitive and emotional responses of low childhood SES consumers make the substitution process easier. Consistent with this idea, research on life history strategy shows that experiencing scarcity during childhood can have a lasting effect on consumer decision making. For example, research has shown that perceived childhood socioeconomic status (SES) influences risk taking and temporal discounting in response to cues about economic uncertainty (Griskevicius et al. 2013). Although seeing images of recession made high childhood SES participants more willing to delay rewards, the same cues made low childhood SES participants less willing to delay rewards (i.e., more impatient; Griskevicius et al. 2013).

In our research, we examine the effects of perceived childhood SES on substitution behavior. Although previous research suggests that experiencing childhood scarcity can make consumers more impulsive, we predict that when making substitution decisions, consumers with low childhood SES will exhibit more patience than those with high childhood SES. Specifically, due to their more extensive practice with not getting what they want, consumers with low childhood SES may have learned cognitive and emotional response strategies that make them better at regulating the negative emotions arising from these experiences, and therefore more willing to accept delays in getting a chosen item.

To better understand the process by which consumers experience substitution, we examine consumers' valuations of chosen items over time. Earlier research shows that low SES consumers exhibit a weaker cognitive dissonance reaction than high SES consumers do, and that their valuations of chosen and non-chosen alternatives do not diverge as much after choice as those of high SES consumers (Snibbe and Markus 2005). One possibility, then, is that low childhood SES consumers will devalue their chosen alternative less than high childhood SES consumers when it becomes unavailable. Another possibility, however, is that given their more extensive practice making substitutions, low childhood SES consumers will devalue their chosen alternative more when it becomes unavailable, making it easier for them to select a replacement.

We test these predictions in a series of studies using choices in two different product categories. In the first study, 256 MTurk participants were given information about three movies they could download. After rating all three movies, they chose one movie to download. After choosing their movie, participants were told that unfortunately, due to technical difficulties, the movie they had chosen was unavailable. They answered several questions about how they felt and then were asked how long they would be willing to wait for their chosen movie to become available. If they chose not to wait, participants could select a replacement from among the remaining two movies. Participants then answered questions about their perceived childhood and current SES using items from Griskevicius et al. (2013). Qualifying earlier research demonstrating that high childhood SES consumers are often more willing to delay rewards, high childhood SES Ps expressed less willingness to wait for their chosen movie than low childhood SES Ps, even though there were no differences in initial evaluations of the movies across groups.

In the second study, 485 student participants read a description of four different articles, rated the articles and then chose one of the articles for a task in which they tagged keywords. After choosing their article, all participants were told that unfortunately, the quota for the article they had selected had already been filled. Half of the participants chose among the other three articles and the other half were assigned one of the three other articles for the task. Participants answered questions about they felt, rated their chosen article again and then answered questions about their childhood and current SES (Griskevicius et al. 2013). When they were told that their chosen article was unavailable, low childhood SES Ps responded by devaluing their chosen article significantly more relative to their initial ratings than high childhood SES Ps. Notably, the devaluation effect was stronger when low childhood SES Ps chose a replacement than when they were assigned a replacement, suggesting that the devaluation was motivated by a desire to make the choice process easier.

In summary, these results suggest that consumers with low perceived childhood SES may have developed strategies to make it easier to cope with more frequent restrictions on the availability of desired alternatives. We find that consumers with low (vs. high) childhood SES are more willing to wait for an initially chosen alternative but are more likely to devalue it when it becomes unavailable, making it easier to choose a substitute. In our planned follow-up studies, we will examine the cognitive and emotional responses that lead to these outcomes.

Effects of Resource Scarcity on Perceptions of Control and Impulsivity

EXTENDED ABSTRACT

Acquisition of resources is vital for any individual's survival and well-being. Failure to successfully harness resources from the environment is a threat and is therefore undesirable. However, consistent access to resources is not a trivial task because availability of resources has been irregular since the dawn of human evolution (Chakravarthy & Booth, 2004). Even modern life is rife with inconsistencies in resource availability. Not only does the economy continue to be characterized by periods of boom and bust, but there is considerable inequality among people in access to resources at any given time. So, how does resource scarcity affect consumers' beliefs, decisions and behavior? For example, do they feel that they are in charge of their lives during tough times or do they feel that they are helpless? Might these beliefs drive their financial behaviors?

Drawing on life history theory, recent work indicates that resource scarcity leads people to respond in divergent ways as a function of their childhood environments (Griskevicius et al., 2013). In the present work, we add to this growing body of work by investigating the effects of resource scarcity on people's perceptions of control and impulsivity. We hypothesize and provide evidence that resource scarcity leads individuals from relatively poorer childhood backgrounds to feel that they have less personal control. Consequently, this psychological sense of decreased control facilitates preference for smaller sooner rewards.

We conducted four experiments to test our hypotheses. In Study 1, we examined our basic prediction that resource scarcity produces different effects on people's control beliefs depending on their childhood backgrounds and not their current economic conditions. We experimentally manipulated scarcity by having participants view a series of photos successfully used in previous research (Hill et al., 2012). In the control condition, participants viewed a series of images depicting objects commonly found in an office. We then examined their sense of control using a state version of an established measure (Lachman and Weaver, 1998). Results revealed that resource scarcity led to a *decrease* in sense of personal control among individuals who had relatively poorer childhoods. Importantly, these beliefs did not vary as function of respondents' current economic conditions.

Study 2 sought to conceptually replicate and extend the findings from the first study. If resource scarcity alters personal sense of control, as predicted by our model, then it should produce different patterns for personal and non-personal sense of control. We tested this possibility in Study 2. Participants read a news article either about the recent economic recession or a control article. Next, they responded to a six item measure of personal sense of control and a six item measure of others' sense of control adapted from a validated scale (Dew & Xiao, 2011). Study 2 conceptually replicated the very specific finding from Study 1. In addition, it showed that this effect was specific to people's *personal* sense of control rather than their more general perceptions about everyone's level of control.

In Study 3, we aimed to show that perceptions of personal control mediate the relation between resource scarcity and impulsive financial behavior. Resource scarcity was manipulated using the procedure as in Study 1. Next, sense of control was measured using the same items as in Study 1. Finally, financial impulsivity was assessed using a set of randomly presented lotteries (Green & Myerson, 2004). Results indicated continued support for our initial predictions. Resource scarcity led individuals from relatively poorer backgrounds to feel a diminished sense of control as compared to individuals from relatively wealthier backgrounds. Furthermore, our mediated moderation analyses revealed that the influence of resource scarcity on people's impulsive behavior was indeed statistically mediated by their sense of personal control.

Study 4 provided additional support for the mediating role of sense of personal control on impulsivity under resource scarcity. To provide further process evidence, we adopted a moderation-of-process experimental design in Study 4. Specifically, besides control and resource scarcity conditions, we included a third condition in which participants experienced a temporary boost in sense of control in addition to exposure to cues of resource scarcity (Whitson and Galinksy, 2008). All participants then responded to questions on impulsivity and childhood SES used in previous studies. We predicted that the observed effect of resource scarcity on impulsivity would be nullified for those experience a temporary boost in sense of control. The results were consistent with this prediction. Resource scarcity led people from poorer backgrounds to become significantly more impulsive as compared to people from poorer backgrounds. More importantly, we no longer found this effect in the condition where participants experienced a boost in sense of control despite being exposed to cues of resource scarcity.

In summary, the current research substantially extends previous work on the effects of resource scarcity on people's psychologies and behaviors. We not only show that resource scarcity produce divergent control beliefs in people as a function of their childhood environments, but we also show that these beliefs may be driving important behaviors such as impulsivity. These findings have important implications for public policy interventions that wish to improve the future life conditions among the ones that are the most susceptible to the effects of resource scarcity. Our findings suggest that infusing a sense of personal control among such individuals may help in reducing impulsive financial behaviors resulting in greater consumer welfare.

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