EFFECTS OF RESOURCE SCARCITY IN CONSUMER BEHAVIOR

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Effects of Resource Scarcity in Consumer Behavior

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CERTIFICATE OF ORIGINALITY

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ABSTRACTS

The reminders of resource scarcity are so pervasive in human lives. From the empty shelf space in the stores, and from their empty wallet to their busy lifestyle, consumers are often surrounded by cues that emphasize the limited nature of resources. Despite its importance and the growing body of knowledge on resource scarcity, only a few theoretical models provide an integrated comprehension of the existing findings and help us understand how and why consumers cope differently with the scarce resources they are facing. And how the salience of resource scarcity causes the motivational consequences in consumptions domain remains underexplored.

In order to address these two issues, in this thesis, I first propose a maximization-reallocation- efficientization (MRE) model of scarcity coping to understand how and why consumers may adopt different coping strategies to mitigate resource scarcity. Specifically, I show that resource scarcity results in three consequences: 1) *resource maximization* (i.e., to increase the available resources possessed by consumers), 2) *resource reallocation* (i.e., to reallocate the resources possessed by prioritizing more important needs and ignoring trivial desires), or, 3) *resource efficientization* (i.e., to endure the resources possessed by using it more efficiently). Based on the existing literature review on resource scarcity, I explain why consumers' coping strategies can be determined by three theoretical moderators: *self-efficacy perception*, *implicit theories about self*; and *the substitutiveness of resources*.

After that, I examine the two motivational outcomes of resource scarcity in consumers' behaviors, namely, consumers' attitudes toward range offers and consumers' effortful pursuit of reward in independent consumption contexts. First, I demonstrate how and when a feeling of

resource scarcity elevates consumers' favorability on a range products or services offer (a marketing offer with two end-points, such as price from HKD100—HKD200). In the four experiments, I exhibit that consumers with a sense of scarcity will activate a relative promotion focus; with this relative promotion focus, they can pay more attention on possible gains than on possible losses and consequently show more favorable attitudes to range offers. In line with this proposed promotion focus account, I demonstrate that the positive effect of scarcity salience on range offers is weakened when consumer suspicion is induced. Second, I provide some novel insights into how the perception of resource scarcity (vs. abundance) might enhance or inhibit consumers' effortful reward pursuit in an independent consumption context. Four studies suggest that situational feelings of resource scarcity induce a need for self-efficacy, thus leading consumers to exert more effort in the reward-seeking process (e.g., manifested as increased task persistence, enhanced performance accuracy, and greater preference for effortful customer reward programs). Consistent with the efficacy-based account, I demonstrate that the positive impact of scarcity salience on effortful reward pursuit is attenuated when rewards are not contingent on effort exertion, when consumers do not believe that greater effort evinces higher self-efficacy, and when consumers' self-efficacy is reassured through self-affirmation. Taken together, these findings contribute to observations about the motivational upside of resource scarcity.

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CHAPTER 1. INTRODUCTION

With the dream of a post-scarcity economy, no one can deny that in today's economy, most consumers are still learning how to allocate their limited resources to satisfy their seemingly unlimited needs and wants. From the United Nations' International Decade for Action "Water for Life" 2005-2015 program to the International Money Fund's warning about oil scarcity (IMF, 2011) and from their empty wallet to their busy lifestyle, consumers are often exposed to cues that activate an overall perception of resource scarcity, making such issues salient in their minds.

Scarcity refers to the sense or experience of having less than one feels one needs (Mullainathan and Shafir 2013; Shah, Shafir and Mullainathan 2015). Although many consumers in contemporary societies consider resource abundance to be a norm (Côté 1993, 1996), the reminders of resource scarcity are nonetheless so pervasive in our lives (Booth 2014), and they obviously have a profound influence on our behaviors. Thus, in recent years, resource scarcity has received increasing attention from researchers across different disciplines, such as economics, for example, extremely poor households are constrained by their economic environments (e.g., Ludwig, Duncan, and Hirschfield 2001); political science, for example, scarcity causes people struggle for survival and intensified appropriative competition (e.g., Iyengar 1990); social psychology, for example, economic uncertainty influences people's saving strategies depends on their childhood socioeconomic status (e.g., Carroll, Hall, and Zeldes 1992), and education, for instance, people who received financial education in childhood saving more than others (e.g., Bernheim, Garrett, and Maki 2001; Connell 1994).

Early work in this body of research viewed scarcity as an element inherent in product availability (Bozzolo and Brock 1992; Campo, Grijsbrechts, and Nisol 2004). Besides, studies have consistently demonstrated that this object-specific scarcity raises the product valuation and drives consumers to desire a product even more (e.g., Amaldoss and Jain 2005; Brock 1968; Cheema and Patrick 2008; Cialdini 2009; Van Herpen, Pieters, and Zeelenberg 2009). For example, the limited supply of a product could lead to enhanced perceived value and increase the desire for that product (e.g., Brock 1968). Researchers have proposed several underlying mechanisms to explain the desirability of a scarce product, such as psychological reactance (for a review, see Brock 1968), the need for uniqueness (Snyder and Fromkin 1980), and heuristic inference of value (Cialdini 1987; Lynn 1991). The impacts of product scarcity on consumers' decision making have also been largely examined in the context of advertising and store display. For example, the perceived scarcity of products promotes the thoughtful information process among consumers (Inman, Peter, and Raghubir 1997). The presence of scarcity message enhances consumers' willingness to pay any amount because consumers believe that scarce products are more special, thus inflating the value of products (Mittone and Savadori 2009). Promotional restrictions, as a typical type of supply-side scarcity, induce a feeling of urgency and a sense of anticipated regret, both of which increase consumers' buying intentions (Swain, Hanna, and Abendroth 2006). Furthermore, the effects of scarcity on buying intention have been differentiated through two sources of scarcity, namely a limited-time scarcity (LTS) or a limited-quantity scarcity (LQS). LQS messages, which induce a sense of competition, have been proven more effective than LTS messages (Aggarwal, Jun, and Huh 2011).

Since consumers are often reminded by scarcity-related cues in the environment, more recent theoretical research on scarcity and consumers' behaviors has begun to investigate situations when an overall sense of scarcity is activated, including how it affects consumers' consumption behaviors (e.g., Fan, Li, and Jiang 2019; Griskevicius et al. 2013; Laran and Salerno 2013; Mehta and Zhu 2016; Shah, Shafir, and Mullainathan 2015; Zhu and Ratner 2015), both temporarily-activated scarcity mindsets (Fan, Li, and Jiang 2019; Mehta and Zhu 2016; Roux, Goldsmith, and Bonezzi 2015), chronic experiences of resource deprivation (Shah, Shafir, and Mullainathan 2015) and childhood experience of resource insufficiency (Griskevicius et al. 2013). For instance, a feeling of resource scarcity will elevate consumers' arousal levels, thus increasing the evaluation polarization of items and consequently higher (vs. lower) choices of favorite (vs. non-favorite) items (Zhu and Ratner 2015). Shah, Shafir, and Mullainathan (2015) argue that inducing the perception of having too little can influence consumer's cognitions and capture their attention, making trade-offs more salient. This inducement consequently leads to more consistent valuations, as consumers who attend to scarcity are less susceptible to context effects. These neglects of information unrelated to current constraints could also result in neglecting what would happen in future rounds, causing excessive borrowing among poor individuals (Shah, Mullainathan, and Shafir 2012).

Despite its importance and the growing body of knowledge on resource scarcity, **only a few theoretical models provide an integrated comprehension of the existing findings and help us understand how and why consumers cope differently with the scarce resources they are facing**.

In addition, previous studies on this issue have mainly focused on examining the impacts of scarcity (vs. abundance) salience on consumers' cognitive function (e.g., Fernbach, Kan, and

Lynch Jr 2015; Shah, Shafir, and Mullainathan 2015), attentional focus (e.g., Monga, May, and Bagchi 2017; Salerno and Sevilla 2017), and physiological responses (e.g., Shah, Mullainathan, and Shafir 2012; Zhu and Ratner 2015), However, **how the salience of resource scarcity causes the motivational consequences in consumptions domain remains underexplored.**

In order to address these two issues, in this thesis, I first propose a maximization- reallocation- efficientization (MRE) model of scarcity coping to understand how and why consumers may adopt different coping strategies to mitigate resource scarcity. After that, I examine the two motivational outcomes of resource scarcity in consumers' behaviors, namely, consumers' attitudes toward range offers and consumers' effortful pursuit of reward in independent consumption contexts. The remainder of the thesis is organized as follows. Chapter 2 examines the maximization- reallocation- efficientization (MRE) model of scarcity coping. I propose specifically that, to cope with resource scarcity, consumers can employ three different categories of strategies: 1) *resource maximization*, 2) *resource reallocation*, and, 3) *resource efficientization*. I further explain why consumers' coping strategies selection can be determined by three theoretical moderators: *self-efficacy perception*; *implicit theories about self*; and *the substitutiveness of resources*. Chapter 3 focuses on one motivational consequence of general resource scarcity, namely, how and when a feeling of resource scarcity elevates consumers' favorability on a range products or services offer (a marketing offer with two end-points, such as price from HKD100—HKD200). I show in the four studies that consumers with a sense of scarcity will activate a relative promotion focus; with this relative promotion focus, they can pay more attention on possible gains than on possible losses and consequently show more favorable attitudes to range offers. In line with this proposed promotion focus account, I found that the positive effect of scarcity salience on range offers is weakened when consumer suspicion is

induced. Chapter 4 focuses on another motivational outcome of resource scarcity. Specifically, it offers some novel insights into how the perception of resource scarcity (vs. abundance) might enhance or inhibit consumers' effortful reward pursuit in an independent consumption context. Four studies suggest that situational feelings of resource scarcity induce a need for self-efficacy, thus leading consumers to exert more effort in the reward-seeking process (e.g., manifested as increased task persistence, enhanced performance accuracy, and greater preference for effortful customer reward programs). Consistent with the efficacy-based account, I demonstrate that the positive impact of scarcity salience on effortful reward pursuit is attenuated when rewards are not contingent on effort exertion, when consumers do not believe that greater effort evinces higher self-efficacy, and when consumers' self-efficacy is reassured through self-affirmation.

CHAPTER 2. CONSUMER BEHAVIORS UNDER SCARCE RESOURCES: THE MAXIMIZATION-REALLOCATION-EFFICIENTIZATION (MRE) MODEL

Despite its importance and the growing body of knowledge on resource scarcity, only a few theoretical models provide an integrated comprehension of the existing findings and help u understand how and why consumer cope differently with the scarce resources they are facing (for an exception, see Cannon, Goldsmith, and Roux 2018). Empirical findings on resource scarcity often contradict one another. For example, some studies suggest that a feeling of resource scarcity encourages consumers to acquire more products (e.g., Roux, Goldsmith, and Bonezzi 2015; Xu, Schwarz, and Wyer 2015). On the other hand, others find that resource scarcity compels people to utilize existing products rather purchasing new ones (Mehta and Zhu 2016). Similarly, reminders of mate scarcity have been shown to lead to both mate approach tendencies (Hill et al. 2012) and career motivations which may lead to delayed mating decisions (Durante et al. 2012).

To reconcile these discrepancies, I propose the maximization- reallocation-efficientization (MRE) model of scarcity coping (see Appendix A). Specifically, I suggest that, to cope with resource scarcity, consumers can adopt three different categories of strategies: 1) *resource maximization* (i.e., to increase the available resources possessed by consumers), 2) *resource reallocation* (i.e., to reallocate resources possessed by prioritizing more important needs and ignoring less important desires), and, 3) *resource efficientization* (i.e., to manage the resources owned by using them more efficiently).

The remainder of this chapter is organized as follows: I first review the existing literature to construct my theoretical framework. I then contextualize the MRE model within the existing

literature of resource scarcity. Based on my literature review and categorization, I also propose novel theoretical moderators that can help one to understand when and why consumers decide to take a particular coping strategy under resource scarcity. Finally, I conclude by suggesting a future research agenda of unresolved issues that will be important to advance the field.

2.1. THE MAXIMIZATION-REALLOCATION-EFFICIENTIZATION (MRE) MODEL OF SCARCITY

2.1.1. Resource Maximization

Previous research has suggested that a feeling of resource scarcity causes consumers to acquire more resources. For example, a feeling of financial deprivation leads consumers to seek scare goods because scare goods are perceived to be more valuable than abundant goods (Sharma and Alter 2012). Similarly, insufficient mates encourage women to choose profitable careers. The reason is that women have difficulties in terms of finding a long-term mate under such circumstances, and seeking high-paying careers could provide financial resources and future security (Durante et al. 2012). Furthermore, an overall perception of resource scarcity systematically shifts consumers' attention, increasing the focus on the self rather than on others, and making decisions to expand their own resources (Roux, Goldsmith, and Bonezzi 2015). These findings show that scarcity prompts a feeling of insufficiency, which in turn triggers a resource maximization strategy by increasing the available resources in one's possession.

2.1.2. Resource Reallocation

Findings in the literature also indicate that resource scarcity stimulates consumers to reallocate their resources by prioritizing more important needs and ignoring trivial desires. For example, scarcity salience leads to trade-offs between different needs and desires by narrowing one's attention to particular domains. Specifically, reminders of poverty compel people to focus on poverty-related concerns and ignore other more important domains (Mani et al. 2013; Shah, Shafir and Mullainathan 2015). In addition, economic uncertainty transfers resources to particular beneficiaries, such as encouraging parents to allocate more resources to their daughters at the expense of their sons. This is because unlike boys, girls have a relative reproductive value and people in uncertain economic conditions put greater emphasis on reproductive investments (Durante et al. 2015). Furthermore, a feeling of mate scarcity causes men to seek rewards at a particular point in time. In particular, mate scarcity leads men to trade off the future benefits and desires for immediate rewards (Griskevicius et al. 2011, 2013). These findings are consistent with a resource reallocation strategy that shifts consumers' attention and prioritize their important needs to relieve the concern about resource deficiency.

2.1.3. Resource Efficientization

Finally, resource scarcity could also force people to manage their resources more efficiently. For instance, the perception of resource scarcity enhances more creative usage of existing products rather than purchasing new ones (Mehta and Zhu 2016). Similarly, a harsh environment leads consumers to show increased preference toward high versus low-calorie food items. This is because high-calorie foods are more filling and because they can provide energy to

the body for a longer period (Laran and Salerno 2013). Moreover, poverty levels have been shown to correlate with the preference for durable goods. The reason is that such goods are made to last for a long time and consumers do not need to purchase them frequently (e.g., Klasen 2000; McCulloch and Calandrino 2003). These findings agree with the notion that resource scarcity leads to a resource efficientization coping strategy, which stretches the resource by using it more efficiently.

2.2. MODERATORS OF THE SCARCITY COPING ROUTE

Based on my literature review and categorization, I propose the following theoretical moderators that can help one to understand when consumers are likely to engage coping methods under resource scarcity. Compared to resource maximization strategy which might directly and ultimately resolve scarcity stressors, both resource reallocation and resource efficientization strategies are regarded as relatively passive reactions in coping with resource scarcity. What's more, two determinants in choosing between resource reallocation and resource efficientization strategies are the urgency and the severity of resource scarcity (e.g., Fernbach, Kan, and Lynch Jr 2015). Based on these distinctions, the potential moderators proposed in this paper include *self-efficacy perception*, *implicit theories about self*, and *the substitutiveness of resources*.

2.2.1. Self-efficacy Perception

As mentioned earlier, compared to the other two coping strategies, the resource maximization strategy is an active coping route which directly and ultimately addresses scarcity

stressors. Thus, consumers are more likely to choose the resource maximization strategy when they believe the resource scarcity is malleable and changeable. Self-efficacy has been defined as the belief that one has the capability to shape outcomes (Bandura 1997). Previous research has suggested that perceived self-efficacy served as a key predictor of how people cope with potential stressors (e.g., Bandura 1986, 1997; Duhachek, Agrawal, and Han 2012; Han, Duhachek, and Rucker 2015; Sujan et al. 1999). Next, I review prior research in terms of when and how self-efficacy influences people to choose coping strategies under resource scarcity. Formally, I propose:

Proposition 1: Consumers who perceive high self-efficacy are more likely to use the *resource maximization* strategy to cope with scarcity. By contrast, low self-efficacy consumers are inclined to respond to resource scarcity using more passive coping strategies (e.g., *resource reallocation* or *resource efficientization* strategy).

In the domain of resource deprivation, when high-efficacy women find it difficult to find a financially reliable, long-term mate, they work harder and seek high-paying careers to obtain financial resources and safeguard their future (Durante et al. 2012). In addition, when high-efficacy consumers (with high power and high social status) face product scarcity, product shortage, and limited time for shopping, they tend to make impulsive choices to acquire even more of these scarce products (e.g., Cheung et al. 2015; Sharma and Alter 2012). Moreover, Roux et al. (2015) suggested that if consumer believed they could compete with others, a feeling of resource scarcity heightened a competitive orientation and consequently led people to adopt a self-focus strategy to acquire more resources.

On the other hand, a feeling of financial deprivation will usually threaten people's perceived self-efficacy. For example, prior studies have shown that individuals with lower resource availability are disrespected because they tend to be stereotyped as being financially incapacitated (e.g., Fiske 2011; Reutter et al. 2009). Specifically, lower income social groups suffer from many forms of scorn, such as being viewed as a societal burden, as a liability and as an incompetent person (Fiske 2011). Poor individuals also tend to suffer from an elevated feeling of helplessness, including increased trouble paying monthly bills and reduced perceived self-esteem and self-ability (Bradshaw and Ellison 2010; William and Collins 1995). Given that perceived financial scarcity is viewed as a low perceived self-efficacy, in line with my prediction, financial deprivation drives consumers to adopt more passive coping strategies (i.e., *resource efficientization*). In particular, financial deprived consumers are more willing to spend their money on material possessions rather than on experience purchases because they believe that material possessions are durable. Mortality salience, a scarcity of lifetime, could also induce a sense of powerlessness among consumers given that people cannot do anything to alter the inevitability of their death (e.g., Arndt, Schimel, and Goldenberg 2003; Mandel and Heine 1999). Previous research has suggested that mortality salience induces the avoidance motivational system, using the passive way (rather than an active way) to respond to this threat (Das et al. 2009; Trafimow and Hughes 2012; Agroskin et al. 2016). That is, rather than acquiring more resources, people who are aware of the inevitability of death distance themselves from potentially threatening stimuli and reallocate their time to carry out some more meaningful tasks (e.g., Agroskin et al. 2016; Greenberg, Solomon, and Pyszczynski 1997).

2.2.2. Implicit Theories about Self

One antecedent, which could alter one's perceived self-efficacy, is situation mutability. In other words, one's ability can be modified or changed (Roese and Olson 2007). Previous research on self-implicit theory suggested that entity theorists believe that people abilities are stable and cannot be altered; on the other hand, incremental theorists argue that all abilities are malleable and changeable (Wood and Bandura 1989). Based on these distinct beliefs, researchers found that entity theorists have lower self-efficacy because they maintain that traits are fixed. However, incremental theorists tend to have higher self-efficacy because they believe traits are malleable, they and are more willing to put more effort to improve their abilities (Yeager and Dweck 2012; Wood and Bandura 1989). Next, I review prior research in terms of when and how self-implicit theory influences people to choose coping strategies under resource scarcity. Below is my second proposition:

Proposition 2: Consumers with incremental belief are more likely to choose the *resource maximization* strategy to cope with scarcity. By contrast, consumers with entity belief are inclined to respond to resource scarcity using more passive coping strategies (e.g., the *resource reallocation* or *resource efficientization* strategy).

In the context of resource scarcity, only a few empirical studies directly focus on the role of self-implicit theory on consumers' reactions under resource scarcity. However, Fan, Zhu, and Jiang (2018) demonstrated that a situational feeling of resource scarcity spurs consumers' effortful reward pursuit in the reward-seeking process. Specifically, they found that in a task that offers resource incentives, consumers confronted by resource scarcity increases effort exertion

through task persistence and performance accuracy. More importantly, they found that consumers' belief about the relationship between effort and ability (i.e., incremental theorists) moderates the impact of scarcity salience on effortful reward pursuit. That is, when people do not believe that greater effort evinces higher ability, they are not likely to exert effort to increase the available resources possessed under scarcity salience. Previous research also proposed the possible connection between self-implicit theory and the life history of resource scarcity (i.e., childhood SES). That is, individuals from low-income families are likely to believe that people's abilities are fixed and cannot be changed through other means. By contrast, people from high-income families are likely to adopt incremental beliefs (Claro, Paunesku, and Dweck 2016). In another research, Mittal and Griskevicius (2014) suggested that people' childhood environments have significant impacts on their future behaviors. Exposure to potential scarcity also leads people from low-income families to experience a significantly lower sense of control than those from wealthy families. Given the limited understanding of how self-implicit theory affects consumers' selection of different coping strategies, future work is needed to test this hypothesis systematically.

2.2.3. The Substitutiveness of Resources

In addition to self-ability, previous research has also suggested that a direct solution will result in consumers' choosing more active or passive approaches to cope with different threats (e.g., Han, Duhachek, and Rucker 2015; Lee and Shrum 2012; Rucker and Galinsky 2013). When people realize that there are alternative ways to solve self-threat or that environmental conditions are favorable for taking actions, they are more likely to adopt a more active and to

aggressively address the threats (e.g., Duhachek, Agrawal, and Han 2012). By contrast, when no potential way is available to overcome the threat, people may take a more passive and avoidant way to overcome the threat. By applying this theory into the context of resource scarcity, it is reasonable to argue that whether consumers could find the substitutes for the scarce resources determine their coping strategies. Formally, I propose:

Proposition3: When no substitutes are available for scarce resources, consumers are more likely to adopt a *resource maximization* strategy to cope with scarcity. By contrast, when no substitutes are available to overcome scarcity, consumers are inclined to respond to resource scarcity using more passive coping strategies (e.g., *resource reallocation* or *resource efficientization*).

Under conditions of resource scarcity, any factors that could alter consumers' perception of the substitutes for the scarce resources may also influence their choice of coping strategies. For example, consumers believe that social resources (e.g., social relationship) and monetary resources can help acquire similar benefits. Thus, when consumers feel their social resources are threatened in the context of social exclusion, they exhibit a stronger desire to acquire more money (as a substitute for popularity). Specifically, socially excluded consumers exacerbate their financial risks by heightening the desire for monetary resources, a behavior that is consistent with the resource maximization approach (Duclos, Wan, and Jiang 2013). Similarly, given that the substitutiveness of the food resources is high, people can easily transfer their monetary or social resources to food. For example, consumers can either purchase food with their own money or ask a friend to purchase food for them. Therefore, when consumers experience food scarcity

(e.g., hunger), they will employ more active strategies to acquire foods and some non-food resources (e.g., Xu, Schwarz, and Wyer 2015; Yam, Reynolds, and Hirsh 2014). By contrast, when people believe that scarcity will persist for a long period and that no substitute items are available, they tend to manage their resources more efficiently. For example, people who live in a harsh environment or unpredictable ecosystem because no substitute goods are available prefer high versus low-calorie food items. This is because high-calorie foods are more filling and because they believe that these high-calorie foods can provide them reliable energy for a longer period (Laran and Salerno 2013), In addition, mate is exclusive and non-substitute resources (Guttentag and Secord 1983). Thus, a feeling of mate scarcity causes men to reallocate possessed resources by prioritizing more important needs and ignoring less important desires. That is, they prioritize their immediate needs and discount their future desires. These findings converge on the notion that consumers are inclined to respond to resource scarcity with more passive coping strategies (e.g., *resource efficientization* or *resource reallocation*), especially when no substitute is available to overcome scarcity.

2.3. A FUTURE RESEARCH AGENDA FOR UNRESOLVED ISSUES

The advancement of the MRE model of resource scarcity provides fruitful avenues for further research. In this section, I outline three areas of inquiry that are mature for empirical investigation. First, the *different manipulations of resource scarcity* could be one potential additional moderator. Scarcity seems to comprise two core components: a control component and a constraint component. Some researchers manipulate the ability to control access to resources (e.g., low vs. high power, childhood SES), whereas some manipulate whether people

feel they have sufficient resources (e.g., having too few or too many resources). These two components sometimes influence human behaviors in similar ways (e.g., both could enhance creativity), but sometimes they may have no influence. Although prior work suggested that the control component could also alter people's perception of self-efficacy (Bradshaw and Ellison 2010; Fiske 2011; William and Collins 1995), future work should empirically test this hypothesis.

Another interesting direction to examine is the distinctions between quantifiable and non-quantifiable resource scarcity. There are many meaningful differences between quantifiable and non-quantifiable resources. For instance, people "own" and have varying levels of control over their quantifiable resources (time, money, etc.), but they do not necessarily have control over non-quantifiable ones like relationships or social capital. While perceived scarcity from different resource domains has different impacts on consumers' perceived control, self-efficacy will offer interesting insights into consumers' coping behaviors under resource scarcity.

Finally, beyond delimiting scarcity to the study of quantifiable (vs. non-quantifiable) resources, another way to categorize what is within the purview of scarcity research is the difference between objective/absolute scarcity and relative/subjective scarcity. For example, the effect of not having sufficient money for housing or food might be different from not having as much money as others because the latter includes a perception of social comparison. Future research is needed to investigate if these different reference points of scarcity elicit distinct coping tendencies.

2.4. SUMMARY

The reminders of resource scarcity are so pervasive in human lives. However, only a few theoretical models provide an integrated comprehension of the existing findings and assist one understand how and why consumers cope differently with the scarce resources they are facing. This chapter responds to these questions by proposing the MRE model of scarcity coping. Specifically, it shows that resource scarcity results in three consequences: 1) *resource maximization* (i.e., to increase the available resources possessed by consumers), 2) *resource reallocation* (i.e., to reallocate the resources possessed by prioritizing more important needs and ignoring trivial desires), or, 3) *resource efficientization* (i.e., to endure the resources possessed by using it more efficiently). Based on the existing literature review on resource scarcity, this chapter explains why consumers' coping strategies can be determined by three theoretical moderators: *self-efficacy perception*, *implicit theories about self*; and *the substitutiveness of resources*.

This review chapter provides important insights into how and why consumers use different strategies to cope with resource scarcity. Through a comprehensive theoretical model, the current review chapter contributes to the understanding of resource scarcity by connecting and integrating consumers' various reactions toward scarcity in the extant literature. By systematically examining and proposing conceptual and empirical moderators, this chapter will also stimulate future work in this emerging research area. Finally, it offers rich practical implications for marketers and policymakers in terms of how to better predict and direct consumer decision making in a resource-scarce world.

CHAPTER 3. A CHANCE TO EXCEL: SCARCITY SAILENCE ENHANCES THE ATTRACTION OF RANGE OFFERS

In today's world, "how much" is no longer an easy question to answer. Marketing offers in a range format have been widely applied in different contexts, such as savings range ("Save X% to Y%"; Burt and Sparks 1994), deal negotiation ("$X-$Y will be an appropriate"; Chertkoff and Baird 1971; Thompson 2012), and dynamic pricing ("The price ranges from $X to $Y"; Yuan and Han 2011). For example, range price is a common practice in the real estate industry (Fischler 2009). A real estate agent will probably set a range price of $325,000 to $375,000 for a house with an estimated market value of $350,000. Range offers are also common in industries in which prices change frequently. Most theme parks have been using changeable prices; that is, consumers pay a higher price on busier days and a cheaper price on low-demand days. Baseball teams also consider the popularity of their opponents in order to decide the price they charge.

Despite its prevalence, range offers can potentially lead to negative reactions among consumers. A potential drawback of range offer is that consumers may see it as a form of price discrimination (e.g., Grennan 2013; Varian 1985). Also, range product or service offers may also induce a feeling of uncertainty among consumers (e.g., Mazumdar and Jun 1992). One question is, how can one minimize its possible negativity and maximize consumers' acceptance toward range offers? This chapter provides answers to this question, and I propose that consumers' attraction to range offers is influenced by the perceived level of general resources.

Will the general perceptions of resource scarcity have an uncovered but significant impact on consumers' attitudes toward range offers? My answer to this question is yes. Based on previous research on resource scarcity and regulatory focus (e.g., Roux, Goldsmith, and Bonezzi

2015; Sengupta and Zhou 2007), I propose that scarcity salience will elevate consumers' relative promotion focus. In the relative promotion focus, consumers will focus more on gains and a corresponding insensitivity to potential losses (Safer and Higgins 2001; Sengupta and Zhou 2007). Compared with fixed offers, range offers grant consumers the opportunity to reach desirable outcomes (e.g., gains; Ames and Mason, 2015). Thus, I hypothesize that a feeling of general resource scarcity will increase consumer's favorableness for range offers. Consistent with this promotion focus account, I further predict that the beneficial effect of scarcity salience on consumers' favorability toward range offers will be weakened when consumer suspicion is induced.

In this chapter, I tested these hypotheses with the four studies. The findings provide important clues for understanding why the reminder of general resource scarcity influences consumers' reactions toward range offers. To the best of my knowledge, the current research is the first to systematically explore the psychological mechanism under which consumers react to range offers. As well as demonstrating an important socio-psychological factor influencing consumers' reactions toward range offers, the results from this research contribute to the motivational consequences of resource availability. Finally, findings of this research also provide intriguing managerial implications in terms of how to utilize the level of resource availability to enhance the acceptance of range offers.

The remainder of this chapter proceeded as follows: I first review previous research to construct my theoretical framework. After that, I explore four studies and analyze the impact of scarcity salience on consumers' reactions toward range offers and its boundary condition. Finally, I conclude with a discussion of potential contributions of this research.

3.1. LITERATURE REVIEW

3.1.1. Resource Scarcity Activates a Relative Promotion Regulatory Focus

Scarcity is perceived when the available resources (natural resources, money, food etc.) are relatively less than one's demand (Mani et al. 2013). Within the context of marketing, resource scarcity has been shown to influence various consumer behaviors, such as cognition (Inman, Peter, and Raghubir 1997; Lynn 1991; Mehta and Zhu 2016); attention (Mani et al. 2013), and physiological responses (Shah, Mullainathan, and Shafir 2012; Zhu and Ratner 2015).

Inspired by the above stream of research, I propose that the reminders of resource scarcity (but not resource abundance) has a novel motivational consequence on people's regulatory orientations. In particular, I elucidate that scarcity salience will induce higher relative promotion (vs. prevention) regulatory focus. I also propose that the motivational consequences of scarcity salience do not merely happen when people's resources are scarce (Roux, Goldsmith, and Bonezzi 2015). More specifically, I argue that the motivational outcomes of perceived general resource scarcity could be held regardless of people's resource level.

People have two fundamental motivations, approach pleasure and avoid pain. Inspired by the earlier work that distinguishes these two motivations, researchers suggest that individuals may exhibit two motivational dispositions: promotion focus and prevention focus (Higgins 1987; Higgins et al. 1994). Promotion focus people view their goals as striving for hopes (e.g., advancement and aspiration). That is, they have a strong desire for seizing opportunities and achieving positive outcomes. In contrast, people with a prevention-focus view are more concerned about pursuing of mandatory tasks (e.g., duties and obligations). Thus they are more

sensitive toward possible losses and try to avoid undesirable outcomes (e.g., Higgins 1997; Higgins et al.1994). In other words, when one is concerned about making gains, the resulting motivations for promotion focus create enhanced eagerness. However, when one is concerned about avoiding the losses, results for prevention focus that created, one becomes increasingly vigilant (e.g., Higgins 1997; Molden, Lee, and Higgins 2008).

According to previous research, treated regulatory focus contains two separate and independent self-regulatory orientations: prevention and promotion. Both systems are assumed to coexist in every individual; general desires can arise for approaching positives or avoiding negatives (Higgins 1997; Molden, Lee, and Higgins 2008). Recently, many researchers believe in "relative regulatory focus" (e.g., Lockwood, Jordan, and Kunda 2002; Sengupta and Zhou 2007). That is, enhancing one type of regulatory orientation will suppress the other concurrently (e.g., Lockwood, Jordan, and Kunda 2002). In this research, I focus on people's relative preference between these two regulatory motivations rather than regarding promotion and prevention orientations as two independent entities.

A relative promotion focus may affect consumer attitudes and actions in various domains, such as message processing (Pham and Higgins 2005), product selection (Molden, Lee, and Higgins 2008), and memory (Higgins et al. 1994). For example, promotion-focused consumers tend to process more deeply on positive signals (Pham and Higgins 2005); increase reliance on affective information (Pham and Avnet 2004); to consider more options (Pham and Chang 2010), and to emphasize disproportionately on ideal-related benefits and impulsive eating behaviors (Sengupta and Zhou 2007).

A finding, which is specifically important to the current project, indicates that promotion focus alters consumers' attention to gains and losses. Given that promotion-oriented people

emphasize maximizing possible desirability, the over-influence of gains (versus losses) is likely to be more extreme for promotion-focused individuals (Chernev 2004). That is, individuals with promotion regulatory focus pay much attention to gains, but they show a corresponding insensitivity to potential losses (Sengupta and Zhou 2007).

Given that the perception of general resource scarcity encourage people to focus relatively on self-benefit and acquisition (i.e., gain part of their life; Roux, Goldsmith, and Bonezzi 2015; certain resource deprivation produces an emphasis on acquisitions from other resource domains; Duclos, Wan, and Jiang 2013; Xu, Schwarz and Wyer 2015), it seems reasonable to argue that scarcity salience could elevate consumers' relative promotion focus. Previous studies provide considerable supports for this proposition. For example, experiencing resource scarcity is an aversive state. People stuck in undesirable situations should display a need to change rather than maintain the status quo, coinciding with promotion motivations (Molden et al. 2009). And prior research repeatedly show that advancement needs and gain approaches are associated with strong promotion focus (e.g., Molden, Lee, and Higgins 2008). For instance, people with a focus on advancement and opportunity, i.e. promotion focus, are motivated to acquire more resources, hence increasing self-gain (Carroll, Arkin, and Wichman 2015, p.234).

3.1.2. Promotion Focus Increases Favorableness for Range Offers

In the real world, range offers have been widely embedded in various marketing practices. One example is a range of savings ("Save X% to Y%") (Burt and Sparks 1994). Another example is deal negotiation, in which the apartment is advertised for a range of price, (say from "$X to $Y"). Range marketing offers can lead to deal and relational benefits compared with a

point offer (Chertkoff and Baird 1971; Fischier 2009; Thompson 2012) and a dynamic pricing strategy, which is the practice of selling goods or services at different prices (The price ranges from "$X to $Y"). Consumers' price expectations toward dynamic pricing strategy are based on the entire historical prices rather than on a single period. More so, consumers search less when they observe higher historical prices but start to search when they perceived a trend of the price increase. In contrast, their search motivations reduce when prices decline (Yuan and Han 2011). Despite its increasing prevalence, research that aims to understand range offers has been scarce. Until recently, researchers systematically investigated the impacts of range offers from a tandem anchoring perspective (Ames and Mason 2015). A selective attention account predicts that offer receivers tend to focus overwhelmingly on the desirable endpoint from the range (the endpoint represents their interests effectively). This is because people have a tendency to select and interpret information based on their goals (e.g., Galinsky and Mussweiler 2001; Lord, Ross, and Lepper 1979; Mussweiler, Strack, and Pfeiffer 2000). In contrast to the selective attention account, Ames and Mason (2015) argued that range offers contain the tandem anchors. That is, offer recipients are influenced by both endpoints, not by the attractive endpoint. People use both endpoints as information signals in terms of making price decisions.

Most times, marketing information features a single point without explicitly conveying gain or loss; for example, the sale price of a car is $10,000. Therefore, consumers need to judge the utility of transaction using various reference levels (e.g., Carbajal and Ely 2012; Thaler 1985). In contrast, range offers have been viewed as opening offers with two reference points (Ames and Mason 2015). Compared with singe-point marketing offers which treated all customers equally, range offers usually provide the opportunity to obtain better or worse outcomes. That is, range offers make both gains and losses salient compared to the point

marketing offers.

Consumer purchase intention could be reflected as an intrinsic consumption valuation, comparing consumption outcomes with reference levels and forming a gain-loss valuation (Carbajal and Ely 2012). Similarly, Thaler (1985, p.205) suggested that the utility of transaction depends on the price paid by individuals based on some reference prices. Reference levels are defined as any stimulus which "other stimuli are seen in relation to the focal stimulus" (Rosch 1975). For example, a reference price has been considered as any price in relation to which current price is seen (Biswas and Blair 1991; Rosch 1975). Besides, perceived gains and losses gains and losses are not fixed; instead, they are contingent on the current actual and reference levels. For example, for the same wool sweater, consumers would be willing to pay a higher price when exposed to higher price contexts than lower price contexts (Adaval and Wyer 2011). Put simply, comparison conveys a gain will increase purchase. Conversely, perceived loss will lower purchase intention (Rao and Gautschi 1982).

3.2. THE CURRENT RESEARCH

From the motivational perspective, I propose that scarcity salience elevates consumers' relative promotion focus, which in turn leads to a greater focus on gains but to a corresponding insensitivity to potential losses. Ranger marketing offers, with two reference points, usually provide possibilities to obtain better or worse outcomes, thus emphasizing both gains and losses simultaneously. Hence, feelings of resource scarcity should lead to a positive attitude toward range offers. Thus, I propose the following hypotheses:

H1: *Reminders of resource scarcity will lead consumers to exhibit more favorable attitudes toward range offers.*

H2: *The effect of scarcity salience on consumers' attitudes toward range offers will be mediated by a heightened relative promotion focus.*

If the effect of scarcity salience on consumer attitudes toward range offers is caused by the elevated relative promotion focus and leads to more focus on gain, lowering the relative promotion focus through other means prior to the encounter of range offers should weaken this effect. One way to correct promotion motivations is via appropriate inductions of a prevention focus (e.g., Sengupta and Zhou 2007; Kirmani and Zhu 2007). The general perception of suspicion or vigilance can be the source of a prevention focus. A natural fit exists between vigilance/ suspicion orientation and prevention focus because the former ensures against the presence of negative outcomes (Higgins et al. 2001). People in a prevention focus are motivated to use vigilance means (e.g., Cacioppo, Priester, and Berntson 1993; Crowe and Higgins 1997). Hence, I predict that the impact of scarcity salience on consumer reactions toward range offers will be diminished through the introduction of suspicion / vigilance. Putting it formally, I propose:

H3: *The effect of scarcity salience on consumers' attitudes toward range offers will be attenuated when suspicion is activated among consumers.*

A total of four studies were conducted to test the effects of scarcity salience on

consumers' favorability toward range offers. The first two studies (Studies 1a and 1b) demonstrated that a feeling of resource scarcity increases consumers' favorable reactions toward range offers, and it is resource scarcity, but not resource abundance, driving the effect. Study 2 confirmed that regulatory focus underlined the impact of scarcity salience on consumers' attitudes toward range offers. Finally, Study 3 examined the moderating role of consumer suspicion.

3.3. STUDY 1: SCARCITY SALIENCE ENHANCES CONSUMERS' FAVORABLE REACTIONS TOWARD RANGE OFFERS

Study 1 examined the main prediction that scarcity salience elevates consumers' favorability toward range offers. In Study 1a, I showed that participants who feel the scarcity of resources reported the more favorable reactions toward range price offers. Study 1b investigated the directional effect of perceived resource availability on consumers' reactions toward range salary offers by adding a resource abundance condition to the research design.

3.3.1. Study 1A

One hundred and twelve American adults joined in this study. Four participants were excluded from further analysis because they reported being highly distracted during the study, leaving 108 participants (M_{age} = 36.7; 50.0% female) in the final sample.

All participants first finished a picture evaluation tasks to manipulate the perceived resource availability (Jiang, Chen, and Wyer 2014; Teng et al. 2016; see Appendix B).

Specifically, participants in the resource scarcity condition saw ten pictures related to resource deprivation (e.g., empty pocket, empty supermarket shelves); whereas participants in the baseline condition viewed 10 landscape pictures (e.g., flowers, mountains). To prove the effectiveness of the resource-availability manipulation, I pretested this manipulation with an independent sample of 59 participants. After they completed the same picture evaluation task (scarcity vs. baseline), I measured participants' perceived resource availability by using three items: "the resources are scarce," "we don't have enough resources," and "we live in a harsh environment" on 9-point scales (1 = totally disagree, 9 = totally agree; α = .92; Roux, Goldsmith, and Bonezzi 2015). The results showed that the manipulation significantly changed participants' perceptions of resource scarcity ($M_{scarcity}$ = 5.24, SD = 2.31 vs. $M_{baseline}$ = 3.67, SD = 2.13; $F(1, 57) = 7.45$, $p = .009$).

Following the picture evaluation task, the participants were asked to imagine that they were planning a trip and indicate their evaluations of a hotel pricing offer. Specifically, I told participants that this hotel has adopted a flexible pricing strategy (the price of a standard room can be varying from US$60 to US$120). After imagining this scenario, participants indicated their evaluations of this range price offer on three items using 9-point scales (i.e., "to what extent do you like this offer"; "to what extent do you think this offer is a good one"; "to what extent do you feel happy about this offer"; 1 = not at all, 9 = very much; α = .98)

Consistent with the expectation, an ANOVA indicated that participants in the resource scarcity condition showed a more positive attitude to the range pricing offer ($M_{scarcity}$ = 5.76, SD = 2.25) than their baseline counterparts ($M_{baseline}$ = 3.64, SD = 2.23; $F(1, 106) = 23.74$, $p < .001$, $\eta_p^2 = .183$). This provided the initial evidence that scarcity salience elevates consumers' favorability toward range offers.

3.3.2. Study 1B

Study 1b aimed to replicate the findings of Study 1a in a different context. In addition, in this study, I used a three-cell (scarcity vs. baseline vs. abundance) between-subjects design to test whether the observed impact of resource availability on consumers' reaction toward range offer is unique to resource scarcity or can be generalized to resource abundance as well. I expected that the observed effect would be driven only by the feeling of resource scarcity, and not by the feeling of resource abundance.

Three hundred American adults participated in this study. Nine participants were excluded from further analysis because they reported being highly distracted during the study, leaving 291 participants (M_{age} = 37.8; 47.4% female) in the final sample.

Participants' perception of resource availability was manipulated with an article-reading task (see Appendix C) adapted from Wu, Zhu, and Ratner (2018); it involved a fictitious research report that highlighted either scarcity or abundance of natural resources (scarcity and abundance conditions) or the visual ability of monkeys (baseline condition). After participants finished reading the article, they were asked to summarize the findings of the article.

After finishing the article task, participants took part in an ostensibly independent task examining the how they evaluate a range salary offer as a job candidate (Ames and Mason 2015). In particular, participants imagined that they interviewed a company and received a range salary offer (US$32,500 to US$47,500). I also told them that people in the similar position are paid US$40,000 served as a reference point. After reading the information, participants responded to the same evaluative questions as I used in the Study 1a (α = .97).

A one way ANOVA indicated that resource availability had significant impacts on participants' attitudes toward the range salary offer ($F(2, 288) = 4.99$, $p = .007$, $\eta_p^2 = .033$). Specifically, participants in the resource scarcity condition showed a more positive attitude to the range salary offer ($M_{scarcity} = 6.05$, SD = 2.01) than their abundance counterparts ($M_{abundance} = 5.17$, SD = 2.17; $F(1, 288) = 8.82$, $p = .003$, $\eta_p^2 = .043$) and those in the baseline condition ($M_{baseline} = 5.33$; SD = 1.97; $F(1, 288) = 5.97$, $p = .015$, $\eta_p^2 = .032$). The latter two conditions showed no difference ($F < 1$, NS). Replicating the findings from the previous study, Study 1b showed that scarcity salience increased consumers' evaluations toward range salary offers. And it is resource scarcity, but not resource abundance, driving the effect.

To summarize, the findings from the first two studies provided converging evidences for the key proposition that scarcity salience elevates consumers' evaluations toward range offers. The robustness of the observed effect is supported by its occurrence with various types of offers (hotel pricing and job salary). Moreover, Study 1b provided support to the prediction that the observed outcome was driven by a feeling of resource scarcity rather than a feeling of resource abundance.

3.4. STUDY 2: THE MEDIATING ROLE OF RELATIVE PROMOTION FOCUS

In Study 2, I intended to show the direct process evidence for the proposed mediator-- a relative promotion focus. I predicted that scarcity salience elevates consumers' relative promotion focus. In the relative promotion focus, consumers put a greater focus on gain, and a corresponding insensitivity to potential loss, which in turn increases their favorability toward range offers because such offers provide the opportunity to reach desirable outcomes.

3.4.1. Method

Two hundred and fifty-one US adults joined this study in exchange for a small payment. I excluded three participants due to they have been highly distracted during the study. The final sample contains 248 participants (M_{age} = 36.4; 47.5% female). I used 2 cells (scarcity vs. baseline) between-subject design.

The resources scarcity article manipulation was same as I used in the Study 1b. After the general resource scarcity manipulation, participants finished the 18-item regulatory focus scale (Lockwood, Jordan, and Kunda 2002; see Appendix D), including both promotion orientation sub-scales (e.g., "I am more oriented toward achieving success than preventing failure"; 9 item, α = .96) and prevention orientation sub-scales (e.g., "I am more oriented toward preventing losses than I am toward achieving gains"; 1 = strongly disagree, 9 = strongly agree; 9 items, α = .90).

Next, all participants took part in a seemingly unrelated consumer decision-making study. Specifically, participants imagined that they need to purchase a vacuum cleaner and found a used vacuum cleaner ad with a range price offer ("I am looking for *US$70- US$130* for it"). I also told them that an average price of similar vacuum cleaners was US$100 served as a reference point. After reading the information, participants responded to the same evaluative questions as I used in the Studies1a and 1b (α = .97).

3.4.2. Results

Regulatory focus. I calculated an index of relative promotion focus by subtracting the summed scores of the prevention items in the regulatory focus scale from the summed scores of the promotion items (e.g., Lockwood, Jordan, and Kunda 2002; Sengupta and Zhou 2007). A higher score on this index represents a greater relative inclination toward promotion focus. Consistent with my expectation, ANOVA indicated that participants in the scarcity condition indicated a higher relative promotion focus ($M_{scarcity}$ = 6.23, SD = 1.11) and those in the baseline condition ($M_{baseline}$= 5.84; SD = 1.35; $F(1, 246) = 6.45$, $p = .012$, $\eta_p^2 = .026$).

Attitude. One-way ANOVA revealed that participants in the scarcity condition reported a more positive attitude toward the range price offer ($M_{scarcity}$ = 6.17, SD = 2.11) than their baseline counterparts ($M_{baseline}$ = 5.59; SD = 2.05; $F(1, 246) = 4.32$, $p = .027$, $\eta_p^2 = .020$).

Mediation Analysis. Next, I ran moderated mediation analyses employing the bootstrapping procedure (with 5,000 resamples, PROCESS Model 4; Hayes, 2012) with resource scarcity as the independent variable, regulatory as the mediator, and evaluation of range price offer as the dependent variable. The results revealed a significant mediation pattern (95% CI = -.2580, -.0072) that excluded 0.

3.4.3. Discussion

I confirmed in Study 2 that the relative promotion focus underlies the effect of scarcity salience on consumers' attitudes toward range offers. Specifically, the feeling of resource scarcity elevates consumers' relative promotion focus, which in turn increases consumers' favorability toward range offers because such range offers inherently grant the opportunity to reach desirable outcomes.

3.5. STUDY 3: THE MODERATING ROLE OF CONUSMER SUSPICION

In Study 3, I sought to provide further evidence of the proposed underlying mechanism with a moderation approach. Suspicion typically triggers greater vigilance that makes people more sensitive to potential losses (Kirmani and Zhu 2007), and it is likely to lead to more prevention orientation and less promotion focus (Crowe and Higgins 1997). I proposed and found in previous studies that resource scarcity increases promotion focus, and then consumers show more favorable attitudes toward range marketing offers. If promotion focus underlies the observed effect, I should expect that the feeling of suspicion would reduce this effect because it can foster prevention focus and reduce promotion focus. Study 3 tested this possibility.

3.5.1. Method

One hundred and fifty-two Hong Kong undergraduates (M_{age} = 21.2; 78.1% female) participated in exchange for a small reward. They were randomly assigned to the four conditions of a 2 (resource availability: scarcity vs. baseline) × 2 (suspicion: suspicion prime vs. neutral prime) between-subjects design.

I used a reading comprehension task (e.g., Cutright and Samper 2014; Wu, Zhu, and Ratner 2018) to manipulate the feeling of resource scarcity. Participants were told to read a (fictitious) article that presumably appeared recently on the National Geographic website (see Appendix E). In the resource scarcity condition, the article reported that food and water in the world were being quickly diminished. In the baseline condition, the article was similar in length,

style, and source but described habits of birds. I pretested the effectiveness of this resource scarcity manipulation with a separate sample of 82 participants. After reading either the scarcity or the baseline article, participants indicated the extent to which they agree that "the resources are scarce," "we don't have enough resources," and "we live in a harsh environment" (1 = totally disagree, 9 = totally agree; α = .94; Roux, Goldsmith, and Bonezzi 2015). As expected, participants in the scarcity condition reported a higher sense of resource scarcity ($M_{scarcity}$ = 6.53, SD = 2.24) than those in the baseline condition ($M_{baseline}$ = 3.97, SD = 2.18; $F(1, 80) = 27.57$, $p < .001$).

After the resource manipulation, as a purportedly unrelated word completion task, participants completed 10 words by filling in one missing letter for each. In the suspicion prime condition, participants completed suspicion-related words such as "doubt," "suspect," and "lie" (Lee and Schwarz 2012; see Appendix F). In the neutral prime condition, all words were neutral, such as "map" and "cinema." After they finished the task, participants indicated the perceived difficulty of this word completion task (1 = not difficult at all, 9 = very difficult).

Finally, similar to Study 1b, participants were asked to evaluate a range salary offer for their summer internship. Participants were told that similar jobs pay around HKD8,000 monthly, and the company they were interviewed by offered a salary range of HKD6,000 to HKD10,000. Participants were asked to indicate their attitude toward this range salary offer by answering the same three attitudinal questions as were used in previous studies (α = .97).

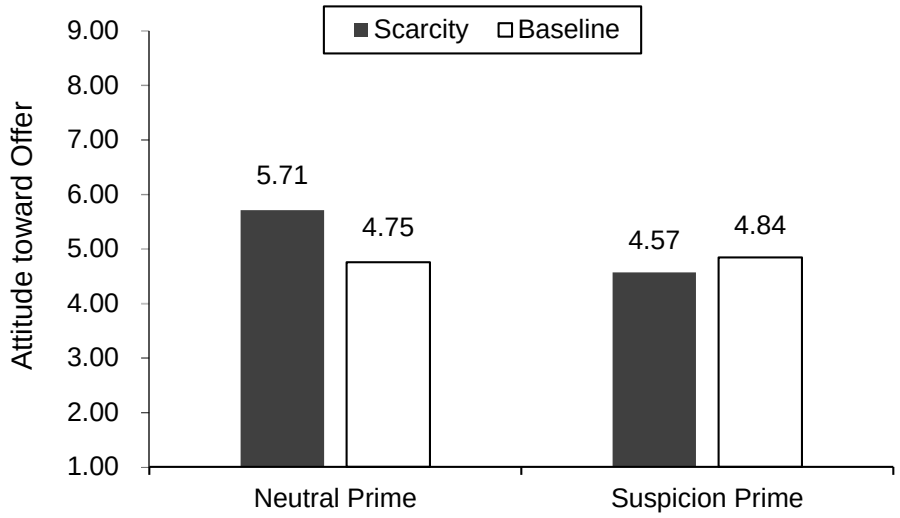
3.5.2. Results

A 2 × 2 ANOVA on task difficulty yielded neither significant main effects nor a significant interaction effect (*p*s > .240). Importantly, the main effect of suspicion on perceived difficulty was non-significant ($F(1, 148) = 1.39$, $p = .240$), suggesting there was no significant difference of perceived task difficulty across suspicion prime and neutral prime conditions. All participants successfully completed all the words presented.

A 2 × 2 ANOVA on consumers' attitude toward the range salary offer revealed only a significant resource availability × suspicion interaction ($F(1, 148) = 4.97$, $p = .027$, $\eta_p^2 = .033$, see Figure 1). In the neutral prime condition, I replicated the previous finding. That is, reminders of resource scarcity led participants to show a more positive attitude toward the range salary offer ($M_{scarcity} = 5.71$, SD = 1.77) than showed by those in the baseline condition ($M_{baseline} = 4.75$, SD = 1.78; $F(1, 148) = 6.08$, $p = .015$, $\eta_p^2 = .039$). However, there was no significant difference in attitude toward the salary offer across scarcity and baseline conditions among suspicion primed participants ($M_{scarcity} = 4.84$, SD = 1.65 vs. $M_{baseline} = 4.57$, SD = 1.59; $F < 1$, NS).

FIGURE 1

MEAN ATTITUDE TOWARD RANGE OFFER AS A FUNCTION OF RESOURCE SCARCITY AND SUSPICION - STUDY 3



3.5.3. Discussion

Consistent with past regulatory focus literature suggesting that suspicion triggers greater vigilance that makes people more sensitive to potential losses and thwarts the promotion focus (Kirmani and Zhu 2007), I found that primed suspicion attenuated the impact of scarcity salience on consumers' favorable attitudes toward range offers. Study 4 thus provides additional support for the underlying mechanism I proposed.

3.6. SUMMARY

Across four studies, I demonstrated that scarcity salience will elevate consumers' relative promotion focus, which in turn will enhance consumers' attitudes toward range offers. The perceived resource scarcity leads consumers to higher their evaluations toward range hotel price offer (Study 1a); show more positive reactions toward range price offer proposed by a seller

(Study 2); increase their evaluations of range salary offer and the likelihood of accepting the job offer (Studies 1b and 3). I further show that the heightened relative promotions focus underlies the linkage between scarcity salience and consumers' reactions toward range offers (Study 2), and this effect will be diminished when the increased promotion focus is counteracted through an externally priming suspicion (Study 3).

This current project enhances our understanding in resource scarcity by enriching the repertoire of behavioral consequences of scarcity salient in the consumption context (e.g., Mehta and Zhu 2016; Shah, Shafir and Mullainathan 2015; Zhu and Ratner 2015) by shifting attention away from investigating the consumers' cognitive performance, to exploring the motivational consequences of general resource scarcity perception on consumers' subsequent evaluations toward range marketing offers. Importantly, to the best of my knowledge, the current research is the first to demonstrate the relationship between scarcity salience and regulatory focus. By systemically investigating the mechanism underlying this effect, I show that mere exposure to general resource scarcity cues can induce a relative promotion focus and consequently influence consumers' judgments in completely different decision contexts. Furthermore, the current findings suggest that impacts of resource abundance are parallel to the baseline condition, suggesting that consumers, by default, perceive the resources are abundant rather than scarce. The findings are in line with the "abundance psychology" which posits modern industrialized societies have taken abundance for granted (Côté 1993, 1996).

The current research also contributes to the existing studies on resource constrain and perceptions of gain and loss. As an important aspect of our life, how a feeling of resource constrain shapes consumers' attitudes toward gains and losses? Previous research suggested that individuals tend to choose are risky option when they fall into a disadvantage situation (e.g.,

Duclos, Wan, and Jiang 2013; Mishra, Barclay, and Lalumière 2014). Lack of social resource causes consumers to pursue riskier financial opportunities (Duclos, Wan, and Jiang 2013). Because people who are competitively disadvantage are less likely to achieve their goals via a safer, low-risk means and should elevate risk-taking orientation. I extend this line of research by suggesting that acquiring more resources will be a motivational mechanisms caused by resource scarcity salience, causing individuals pay more attention of gains over losses.

The findings of this research further extend our knowledge of range offers from a psychology perspective. Previous studies on this area have mostly focused on a selective attention account perspective, predicting offer recipients tend to focus overwhelmingly on the attractive end of the range (the endpoint better represent their interests) (e.g., Galinsky and Mussweiler 2001; Mussweiler, Strack, and Pfeiffer 2000; for an exception, see Ames and Mason 2015). The findings of current studies suggest that range offers make both gains and losses salient compared to the point offers. And offer recipients are influenced by both endpoints rather than only the attractive endpoint. People use both endpoints as information signals in terms of forming price judgments.

Finally, these findings provide implementable managerial implications to marketers set flexible prices for products or services based on current market demands. Despite its popularity, dynamic pricing strategy carries some hidden risks, such as perceived price discrimination. The findings of this research indicate that inducing a feeling of resource constrain (e.g., presentations of scarce rather than abundant supply of available items) as some effective ways to promote acceptance of dynamic pricing. On the other hand, for those context where scarcity-related cues are present (e.g., commodity shortages), the message framing on persuasion should fit on the promotion focus is triggered by scarcity salience. For example, appeals presented in gain frames

(versus loss frames) are more persuasive for promotion-focus consumers (e.g., Lee and Aaker 2004).

CHAPTER 4. SCARCITY SPURS EFFORTFUL REWARD PURSUIT

The face of human society is ever changing. Although resource abundance is often taken for granted in many contemporary societies (Côté 1993, 1996), consumers increasingly encounter environmental cues that may remind them that the resources in their lives are insufficient or limited in some way (e.g., Kristofferson et al. 2016; Mani et al. 2013; Mehta and Zhu 2016; Salerno and Sevilla 2017; Sevilla and Redden 2014). By insufficiency I refer to the sense or experience of having less than one feels one needs (Mullainathan and Shafir 2013). Simultaneously, individuals' drive to pursue rewards is a fundamental force propelling human society forward (Duckworth, Eichstaedt, and Ungar 2015; McClelland 1961). Reward is often seized through exerting effort and overcoming obstacles (Aronson and Mills 1959; Weiner 1972). Although the process of effort exertion itself is aversive and depleting (Bagchi and Li 2011), the outcome obtained during effortful pursuits is certainly rewarding and motivating, giving rise to a sense of value and competence (Aronson and Mills 1959; Weiner 2005). Building on consumers' desire for effortful reward pursuit, many businesses and non-profit organizations now intentionally provide opportunities for consumers to exert efforts during the consumption process, such as designing and manufacturing products themselves (e.g., Franke, Keinz, and Steger 2009; Wolf and McQuitty 2011), or committing certain levels of effort in exchange for a future reward in a company's customer reward program (e.g., Bagchi and Li 2011; McFerran and Argo 2014).

Given that overall material abundance, feeling of scarcity, and effortful reward pursuit are three integral characteristics of contemporary society, what are the relationships among these characteristics? Extant research offers conflicting predictions about the impact of resource availability on effortful reward pursuit. On one hand, the poor are often stereotyped as being lazy

and lacking motivation for effortful exertion (Kluegel and Smith 1986; Smith and Stone 1989), which suggests that people intuit a negative impact of resource scarcity on the effortful pursuit for reward. Very little empirical evidence supports this causality. On the other hand, limiting availability of one particular type of resources (e.g., the required resources for the task at hand are insufficient) has been shown to facilitate goal pursuit within that context (e.g., Moreau and Dahl 2005). It is worth to investigate, though, whether such a context-dependent positive impact of resource scarcity on effort exertion and goal pursuit holds in independent reward-seeking contexts, and if so, why.

This research tackles these questions to offer some novel insights into how a perception of resource scarcity (vs. abundance) might enhance or inhibit consumers' effortful reward pursuit in an independent consumption context. This investigation holds importance due to consumers are frequently encounter cues which could activate an overall perception of resource scarcity, making it salient in their minds. These encounters may influence their motivational orientation and affect goal pursuit in subsequent consumption contexts, such as their level of effort exertion in the purchase and consumption processes and their willingness to commit effort in customer reward programs. The results from this research contribute to the motivational consequences of resource availability, contributing to prior studies in this area that have principally focused on examining the impact of scarcity (vs. abundance) salience on cognitive function (Fernbach, Kan, and Lynch Jr 2015; Shah, Shafir, and Mullainathan 2015), attentional focus (e.g., Monga, May, and Bagchi 2017; Roux, Goldsmith, and Bonezzi 2015; Salerno and Sevilla 2017), and physiological responses (Shah, Mullainathan, and Shafir 2012; Zhu and Ratner 2015). The findings of the current research also provide intriguing managerial implications in terms of how

to utilize the level of effort embedded in marketing and consumption activities as a positive motivation for consumers.

I propose that the reminders of resource scarcity (but not resource abundance) lead consumers to exert more effort in subsequent, unrelated reward-seeking contexts. I argue that this context-independent effect of resource availability on effortful reward pursuit occurs because scarcity heightens the need for self-efficacy, that is, the desire to demonstrate one's value and competence (Bandura 1997; Fiske 2011; Luszczynska, Gutiérrez-Doña, and Schwarzer 2005; Reutter et al. 2009). Given that effortful reward pursuit can potentially serve as a means to gain or restore self-efficacy (Loewenstein 1999; Loewenstein and Issacharoff 1994), I predict that encountering resource scarcity in a prior context will spur consumers' effort exertion in subsequent, independent reward-seeking contexts.

The remainder of this chapter proceeds as follows: I first review the relevant literature and the logics for the predictions about how the situational feelings of resource scarcity might spur consumers' effortful reward pursuit in independent consumption contexts. Next, I delineate theoretically driven boundary conditions for the proposed effects. I conclude with a discussion of contributions of these findings.

4.1. LITERATURE REVIEW

Despite its importance and the growing body of knowledge on resource scarcity, how salience of resource scarcity causes the motivational consequences on effort exertion and goal pursuits remains worth exploring. In the current project, I investigate the impact of scarcity salience on consumers' effortful reward pursuit. Specifically, I elucidate why a feeling of

resource scarcity (vs. abundance) induces a need for self-efficacy and consequently spurs consumers' effortful exertion in independent reward-seeking contexts. Given that the essence of self-efficacy is the effort-reward contingency, I demonstrate why the positive effect of scarcity salience on consumers' effortful reward pursuit will be moderated by this contingency, as well as by consumers' belief about the linkage between effort and self-efficacy, and experimentally fulfilled need for self-efficacy.

4.1.1. Resource Scarcity Activates a Need for Self-efficacy

A feeling of resource scarcity (vs. abundance) would potentially threaten one's perception of self-efficacy, which in turn triggers a need to restore self-efficacy. With self-efficacy framed as one's confidence in the ability to produce designated outcomes (Bandura 1997), it's clear that resources serve as tools to better satisfy individuals' needs and desires (Verdin and Williamson, 1994). Thus, individuals facing scarce resource levels have lower efficacy to determine outcomes and satisfy desires. Previous research shows that individuals with lower resource availability receive less respect because they tend to be stereotyped as being incapable (e.g., Fiske 2011; Reutter et al. 2009). For example, Fiske (2011) theorizes that lower-income social groups suffer from others' scorn, such as being viewed as a societal burden, unmotivated, and incompetent. Similarly, individuals who suffer from resource hardship tend to experience an increased feeling of helplessness, including increased trouble paying monthly bills, being viewed as a useless person in social support systems, and feeling threats to their self-esteem and personal value (Bradshaw and Ellison 2010; William and Collins 1995). Given that the perception of self-efficacy is crucial to personal well-being, and threats to self-efficacy are

aversive (Bandura 1986; Holden 1992), the decreased perception of self-efficacy arising from resource scarcity might activate a self-defensive mechanism causing people to respond actively by seeking ways to regain confidence in their abilities (Tesser 2000, 2001).

4.1.2. The Need for Self-efficacy and Effortful Reward Pursuit

Prior work has long theorized about a possible connection between need for self-efficacy and effortful reward pursuit (Schunk 1989, 1991). Broadly defined, effortful pursuit of reward can represent a desire to develop and demonstrate competence in particular situations (Dweck 1986; Spence and Helmreich 1983). This is because the behavior-outcome contingency embedded in effortful reward pursuit (Seligman 1975) enables it to function as a viable way to prove one's capability to shape outcomes and therefore restore self-efficacy. While need for self-efficacy is not a key determinant for all behaviors (e.g., when individuals have well-established skill or when the tasks are easy; Bandura 1986), individuals frequently appraise and pursue self-efficacy in effortful reward-seeking contexts (Brown and Inouye 1978; Schunk 1989). For example, college students persisted longer in an anagram-solving task when they were informed that the task would be used to judge their ability (Brown and Inouye 1978). Similarly, previous research suggests that the desire to demonstrate one's abilities is a strong predictor for individuals' career choice. Specifically, those who have a high desire to prove themselves are inclined to select careers in math and science (Hackett 1995).

4.2. THE CURRENT RESEARCH

The observed linkages between resource scarcity and self-efficacy compensation motivation, as well as the findings suggesting how effortful reward pursuit could potentially serve as a strategy to regain self-efficacy, together indicate that a feeling of resource scarcity (vs. abundance) induces a need for self-efficacy and consequently spurs consumers' effortful exertion in subsequent reward-seeking contexts. Thus, I hypothesize:

H1: *The salience of resource scarcity (vs. abundance) spurs consumers' effortful reward pursuit.*

H2: *Consumers' need for self-efficacy mediates the impact of scarcity salience on effortful reward pursuit*.

Given that effortful reward pursuit involves accomplishing something challenging, it is understandable that sense of self-efficacy is fulfilled through the effort-reward contingency. On one hand, a personal sense of self-efficacy can only be obtained when the outcome is rewarding. Without the reward, individuals cannot assess whether their performance is good or bad, and thus pointless effort without the eventual desired reward is not able to demonstrate one's capacity to shape outcomes (Elliot and Church 1997; McClelland 1961). On the other hand, the reward itself, in the absence of effort, is not a sufficient condition for achieving the sense of efficacy. Effort exertion has been linked to increased valuation. For example, Aronson and Mills (1959) reported that the more effort the group initiation process involved, the greater the subsequent liking for the group. When the reward pursuit is too easy and does not require any effort, individuals cannot attribute success to their own ability (Weiner 1972, 1986). Effort-independent rewards

convey that individuals have little control over the outcome of an action, perhaps leading to feelings of helplessness rather than self-efficacy (Deci, Koestner, and Ryan 1999; Eisenberger and Cameron 1996). Thus, both outcome possibility and the process of effortful exertion are necessary conditions for engendering a perception of self-efficacy. Stating it differently, the need for self-efficacy cannot be satisfied when the effort-reward contingency is broken. Accordingly, I hypothesize:

> ***H3:*** *Effort-reward contingency moderates the positive effect of resource scarcity on effortful reward pursuit.*

The belief that input of effort generates desired outcomes and self-efficacy is ingrained in many cultures. For example, old sayings such as "they that sow in tears shall reap in joy" promise positive outcomes at the price of hardship. "No pain, no gain" serves as a mini-narrative for the modern American society (Morris 2005). However, not everyone believes in this positive link between effort and self-efficacy (Blackwell, Trzesniewski, and Dweck 2007). For example, entity theorists consider people's traits to be fixed and consistent over time, and not alterable through effortful exertion; these theorists tend to treat effortful reward-pursuit situations as tests or measures of competence, rather than opportunities to improve one's ability and increase competence (Dweck and Leggett 1988). Thus, entity theorists tend to believe that individuals who need to exert effort in reward-seeking situations have low rather than high abilities (Blackwell, Trzesniewski, and Dweck 2007). If the beneficial effect of resource scarcity over resource abundance on effortful reward pursuit mainly arises from the belief that greater effort

evinces higher self-efficacy, the effect should be attenuated when consumers do not hold such a belief. Thus, I hypothesize:

H4: *Consumers' belief that greater effort evinces higher self-efficacy moderates the impact of scarcity salience on effortful reward pursuit.*

Moreover, if the positive effect of scarcity salience on consumers' effortful reward pursuit is indeed driven by a heightened need for self-efficacy, satisfying this need through other means should weaken this effect, such as self-affirmation, that is, affirming positive aspects about the self (Sherman and Cohen 2006). While self-worth has been stressed as a primary activator of self-efficacy orientation (Covington 1984), self-affirmation serves as an effective tool to ensure people's self-worth by providing them the chance to reflect on their value and release them from defensive responses when trying to enhance their reputation (Sherman and Cohen 2006). The proposed theory holds that a general sense of resource scarcity spurs effortful reward pursuit because scarcity induces a need for self-efficacy. If this is the case, when consumers' sense of self-efficacy is obtained through self-affirmation, they should exhibit less effortful reward pursuit, even when resource scarcity is salient. Thus, I hypothesize:

H5: *Self-affirmation moderates the impact of scarcity salience on effortful reward pursuit.*

Four studies were conducted to investigate the effect of scarcity salience on effortful reward pursuit. Study 1 demonstrates that participants under resource scarcity (vs. abundance) increase effortful exertion, captured through task persistence and performance accuracy, in a task

that offers a monetary incentive. Study 2 demonstrates that rather than activating a general desire to obtain monetary resources, a feeling of resource scarcity increases participants' effortful reward pursuit in a non-monetary charity donation context. Study 3 explains why scarcity salience spurs consumers' effortful reward pursuit by demonstrating the mediational role of the need for self-efficacy and the moderating role of consumers' lay belief about the relationship between effort and self-efficacy. Finally, Study 4 further validates the proposed efficacy-based mechanism by illustrating absence of the effect when consumers' sense of self-efficacy is ensured through self-affirmation.

4.3. STUDY 1: RESOURCE SCARCITY SPURS EFFORTFUL REWARD PURSUIT IN A REVERSE-TYPING TASK

I posited that a feeling of resource scarcity (vs. abundance) urges consumers to exert more effort to pursue rewards in an independent context. Study 1 tested this hypothesis by using a 3-cell (resource availability: scarcity vs. abundance vs. control) between-subjects design. I manipulated the perception of resource availability through a writing task. Effortful exertion was captured through measures of task persistence and performance accuracy in an ostensibly independent task that offered participants the chance to type random strings in reverse order to earn monetary reward. I expected that scarcity salience would increase persistence and accuracy in this reverse-typing task.

4.3.1. Method

One hundred and seventy-seven American adults (M_{age} = 35.6, 55.9% female) joined in this study. This study adopted a one-way three-cell (resource scarcity vs. resource abundance vs. control) between-subjects design. All participants first finished a writing task to manipulate the perceived resource availability. Specifically, they listed and described several situations where they felt that they had scarce resources (scarcity condition), or several situations where they felt that they had plenty of resources (abundance condition), or several things they did during the past week (control condition; Mehta and Zhu 2016; see Appendix G).

Following the writing task, participants carried out an ostensibly independent typing task, which asked them to type randomly generated 6-letter strings (e.g., lgirpw) in the reverse order (e.g., wprigl). Participants were provided with about two hundred 6-letter strings (see Appendix H). For each correct reversely typed string, participants received a monetary reward. They were given a maximum of 3 minutes for the task and could quit the typing task and proceed to the end of the survey whenever they wanted.

4.3.2. Results

Pretest. I pretested the effectiveness of the resource-availability manipulation employed in the main study with an independent sample of 93 participants (M_{age} = 35.1, 54.8% female). After they completed the same writing task (scarcity vs. abundance vs. control), I measured participants' perceived resource availability by using two items: "resources in this world are abundant" and "resources in this world are scarce" on 9-point scales (1 = strongly disagree, 9 = strongly agree; Zhu and Ratner 2015). The results showed that the manipulation significantly changed participants' perceptions of resource scarcity ($F(2, 90) = 15.01$, $p < .001$) and resource

abundance ($F(2, 90) = 9.00$, $p < .001$). Participants who listed resource-scarcity situations indicated greater perception of resources being scarce in their surrounding environment (M = 7.10, SD = 1.32) than those in the control (M = 4.97, SD = 2.58; $F(1, 90) = 17.01$, $p < .001$) and abundance conditions (M = 4.28, SD = 1.94; $F(1, 90) = 27.36$, $p < .001$). The latter two conditions showed no difference ($F(1, 90) = 1.81$, $p = .182$). Similarly, participants who listed resource-scarcity situations perceived resources in their environment as less abundant (M = 3.34, SD = 2.01) than those in the control (M = 4.83, SD = 2.11; $F(1, 90) = 8.30$, $p = .005$) and abundance conditions (M = 5.59, SD = 2.03; $F(1, 90) = 17.32$, $p < .001$), whereas the latter two conditions showed no difference ($F(1, 90) = 2.16$, $p = .145$).

Persistence. To examine how resource-availability perception influences participants' task persistence, I first conducted an analysis of variance (ANOVA) on the total amount of time participants spent on the typing task, which revealed a significant main effect ($F(2, 174) = 5.42$, $p = .005$, $\eta_p^2 = .059$). Specifically, participants in the scarcity condition (M = 176.61sec, SD = 14.96) spent more time on this reverse-typing task than their abundance counterparts (M = 154.11sec; SD = 55.51; $F(1, 174) = 7.11$, $p = .008$, $\eta_p^2 = .081$) and those in the control condition (M = 153.89sec; SD = 52.61; $F(1, 174) = 8.68$, $p = .004$, $\eta_p^2 = .080$). The latter two conditions showed no difference ($F < 1$, NS).

I conducted a second ANOVA on the number of strings typed, which also revealed a significant main effect ($F(2, 174) = 15.90$, $p < .001$, $\eta_p^2 = .155$). Specifically, participants in the scarcity condition typed more strings (M = 35.64, SD = 13.79) than those in the abundance (M = 26.55; SD = 12.13; $F(1, 174) = 13.36$, $p < .001$, $\eta_p^2 = .107$) and control conditions (M = 23.15; SD = 12.65; $F(1, 174) = 30.24$, $p < .001$, $\eta_p^2 = .185$), whereas abundance and control conditions showed no difference ($F(1, 174) = 1.90$, $p = .170$).

Accuracy. Next, I examined the number of correctly typed strings across the three experimental conditions. An ANOVA showed a significant main effect ($F(2, 174) = 16.36$, $p < .001$, $\eta_p^2 = .158$). Specifically, participants in the scarcity condition typed more strings correctly ($M = 33.16$, $SD = 13.71$) than their abundance counterparts ($M = 23.11$; $SD = 13.71$; $F(1, 174) = 15.45$, $p < .001$, $\eta_p^2 = .118$) and those in the control condition ($M = 20.30$; $SD = 12.61$; $F(1, 174) = 30.30$, $p < .001$, $\eta_p^2 = .195$). The latter two conditions showed no difference on the number of correctly typed strings ($F(1, 174) = 1.22$, $p = .271$).

4.3.3. Discussion

Based on real behavioral outcomes, Study 1 provided empirical support that scarcity salience spurs effortful exertion in a subsequent, unrelated reward-seeking context. Specifically, I found that an overall perception of resource scarcity (vs. abundance) activated through a writing task increased both task persistence and performance accuracy in an ostensibly independent typing task that offered monetary reward for each string correctly typed. Further, the non-significant difference observed across the resource abundance and control conditions suggested that the participants in this study tend to perceive they have abundant (rather than scarce) resources. The current findings supported my theorizing that resource scarcity, but not resource abundance, drives the effects of resource availability on consumers' effortful pursuit of reward in independent consumption contexts.

Notably, I found that scarcity salience not only led participants to spend more time on reverse typing, it also increased the total number of correctly typed strings. These results implied that it is less likely that the reminder of resource scarcity simply activated an action tendency,

and therefore participants in the scarcity condition typed more. Rather, participants who felt resource scarcity appeared to be more motivated to achieve the reward attached to the outcome through their effort. Following this line of reasoning, Study 2 further disentangled whether scarcity salience causes a general desire to obtain monetary resources, or if it increases consumers' motivation to pursue rewards for the sake of self-efficacy.

4.4. STUDY 2: RESOURCE SCARCITY SPURS EFFORTFUL REWARD PURSUIT IN PET-FOOD DONATION

Study 2 had three main objectives. First, I further validated this context-independent effect of perceived resource scarcity on effortful reward pursuit. To this end, Study 2 manipulated scarcity (vs. abundance) salience in a specific resource domain, that is, the university library, and measured students' effortful exertion in an unrelated typing task. Second, I employed a non-monetary reward (in particular, pet food donated to a local animal shelter) to demonstrate that the proposed effect of scarcity (vs. abundance) salience on effortful reward pursuit is not caused by a general desire to obtain monetary resources. Third, I intended to provide process evidence for the proposed efficacy-based account. Specifically, I theorized that the effect of scarcity (vs. abundance) salience on effortful reward pursuit is based on a heightened need for efficacy. Given that seeking self-efficacy through effortful reward pursuit has two necessary conditions—effort exertion and reward existence (i.e., the effort-reward contingency; Loewenstein 1999; Loewenstein and Issacharoff 1994)—I expected to see the impact of scarcity salience on effortful reward pursuit attenuated when rewards are not determined by one's effort inputs (i.e., when the effort-reward contingency is broken).

4.4.1. Method

Two hundred and thirty-one undergraduate students joined in this laboratory study. Four participants were excluded from further analysis because they failed to follow the study instruction, leaving 227 participants (167 women, mean age = 21.36 years, *SD* = 3.23) in the final sample. This experiment adopted a 2 (resource availability: scarcity vs. abundance) × 2 (effort-reward contingency: effort-contingent reward vs. fixed reward) between-subjects design. Participants' perception of resource availability was manipulated with an article-reading task adapted from Wu, Zhu, and Ratner (2018); it involved a fictitious research report that highlighted either the scarcity or abundance of university library resources based on three criteria (the size of book collections, study space availability, and the number of librarians, see Appendix I). After participants finished reading the report, they were asked to elaborate on how the library resource availability could be relevant to them and affect their university life. Finally, participants responded to the same manipulation check that was used in the pretest of Study 1.

After finishing the article task, participants took part in an ostensibly independent task examining the extent to which college students are willing to help animals. Specifically, participants worked on a reversed-typing task similar to the one I used in Study 1, which asked them to type randomly generated 6-letter strings (e.g., lgirpw) in the reverse order (e.g., wprigl). The only change was that in this study, there was no time limit and participants could type as long as they wished. In the effort-contingent reward condition, participants were told that researchers would donate 10g branded pet food to a local animal shelter for each letter string they correctly typed. In the fixed reward condition, I informed participants that researchers

would donate 500g branded pet food to a local animal shelter as long as they took part in this typing task. In other words, while in the former condition the amount of pet food donated to the animal shelter was contingent on the number of letter strings participants correctly typed, this effort-reward contingency was absent in the latter condition.

4.4.2. Results

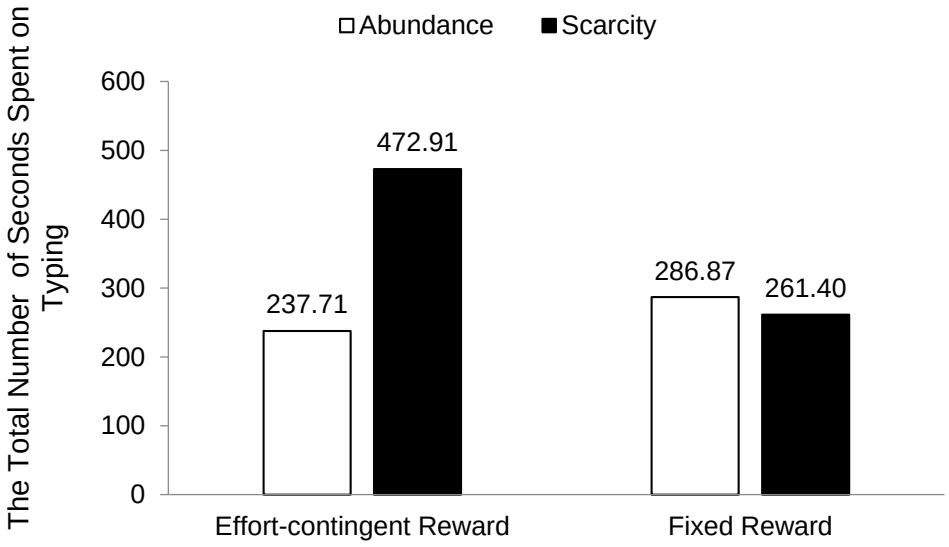
Manipulation checks. Participants who read the article describing the scarcity of university library resources perceived resources in the world as more scarce (M = 6.80, SD = 1.90) compared to those in the abundance condition (M = 3.51, SD = 1.86; F(1, 225) = 174.51, p < .001). Similarly, participants in the scarcity condition perceived resources in the world as less abundant (M = 3.35, SD = 1.83) than did those in the abundance condition (M = 6.78, SD = 1.65; F(1, 225) = 219.61, p < .001).

Persistence. As in Study 1, I first checked the task persistence by calculating the total amount of time participants spent on the typing task. A 2 × 2 ANOVA yielded significant main effects of both resource availability (F(1, 223) = 9.52, p = .002) and effort-reward contingency (F(1, 223) = 5.70, p = .018), qualified by a significant resource availability × effort-reward contingency interaction (F(1, 223) = 14.71, p < .001, η_p^2 = .062; see Figure 2). Replicating observations in the previous study, participants in the scarcity condition (M = 472.91sec, SD = 363.25) spent more time on this reverse-typing task than their abundance counterparts did (M = 237.71sec; SD = 197.99; F(1, 223) = 23.44, p < .001, η_p^2 = .095) when the amount of pet food donated was contingent on the number of letter strings that participants correctly typed. However,

in the fixed reward condition this difference disappeared between scarcity (*M* = 261.40sec, *SD* = 207.16) and abundance conditions (*M* = 286.87sec, *SD* = 225.28; *F* < 1, NS).

FIGURE 2

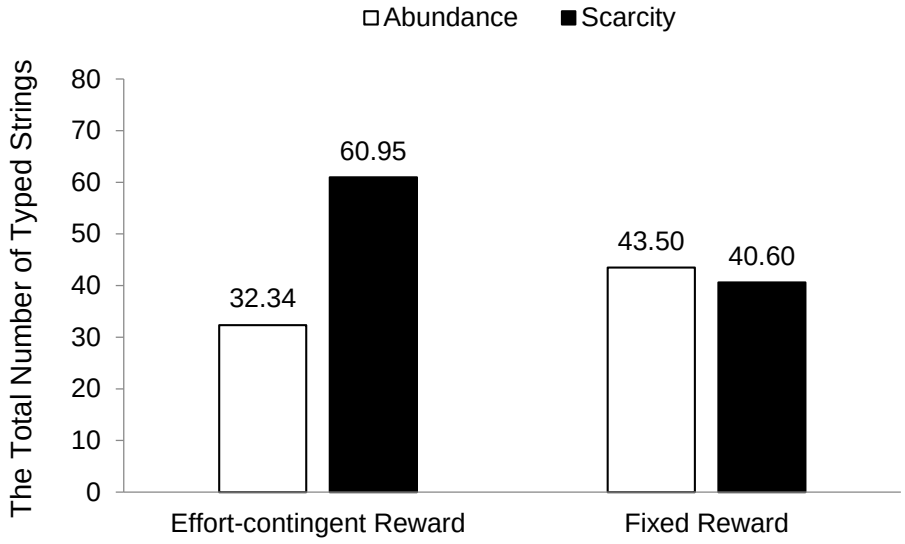
STUDY 2: IMPACT OF RESOURCE AVAILABILITY AND EFFORT-REWARD CONTINGENCY ON WORK TIME (IN SECONDS) - STUDY 2



I checked the task persistence by looking at the number of strings typed. A 2 × 2 ANOVA demonstrated a significant main effect of resource availability ($F(1, 223) = 7.84$; $p = .006$), qualified by a significant resource availability × effort-reward contingency interaction ($F(1, 223) = 11.78$, $p = .001$, $\eta_p^2 = .050$; see Figure 3). Again, in the effort-contingent reward condition, participants in the scarcity condition typed more strings (*M* = 60.95, *SD* = 35.19) than their abundance counterparts did (*M* = 32.34, *SD* = 31.45; $F(1, 223) = 19.01$, $p < .001$, $\eta_p^2 = .079$). The scarcity and abundance conditions showed no difference (*M* = 40.60, *SD* = 34.86 vs. *M* = 43.50, *SD* = 36.54; *F* < 1, NS) when the reward was fixed.

FIGURE 3

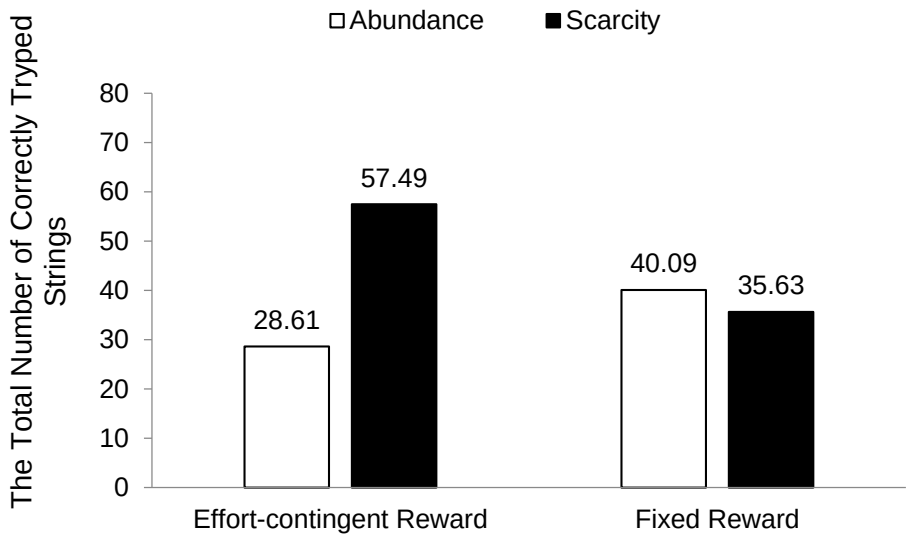
IMPACT OF RESOURCE AVAILABILITY AND EFFORT-REWARD CONTINGENCY ON THE NUMBER OF TYPED STRINGS - STUDY 2



Accuracy. Next, I examined the number of correctly typed strings across conditions. A 2 × 2 ANOVA demonstrated a significant main effect of resource availability ($F(1, 223) = 7.84$; $p = .006$), qualified by a significant resource availability × effort-reward contingency interaction ($F(1, 223) = 14.59$, $p < .001$, $\eta_p^2 = .061$; see Figure 4). Replicating what I found in the previous study, participants in the scarcity condition typed more strings correctly ($M = 57.49$, $SD = 34.98$) compared to their abundance counterparts ($M = 28.61$, $SD = 31.07$; $F(1, 223) = 21.44$, $p < .001$, $\eta_p^2 = .088$) when the amount of pet food donated was contingent on accuracy. However, in the fixed reward condition this difference disappeared between scarcity ($M = 35.63$, $SD = 29.92$) and abundance conditions ($M = 40.09$, $SD = 35.38$; $F < 1$, NS).

FIGURE 4

IMPACT OF RESOURCE AVAILABILITY AND EFFORT-REWARD CONTINGENCY ON THE NUMBER OF CORRECTLY TYPED STRINGS- STUDY 2



4.4.3. Discussions

Taken together, the findings from the first two studies provided converging support for the key proposition that a perception of resource scarcity (vs. abundance) leads consumers to exert more effort in independent reward-seeking contexts. This effect was manifested in both participants' task persistence and performance accuracy in a reverse-typing task, applies to both monetary rewards and non-monetary incentives (e.g., charity donation), and across different resource availability manipulations (e.g., general resources vs. a specific resource domain). These results suggested that, rather than activating a need to acquire more financial resources, or an action orientation, scarcity salience increased consumers' effortful reward pursuit in independent consumption contexts. Furthermore, consistent with the proposed process based on

self-efficacy, I found that the positive effect of scarcity salience on effortful reward pursuit is weakened when the effort-reward contingency is broken. In the following studies, I aimed to provide further process evidence for the proposed efficacy-based account by showing that the effect of scarcity salience on effortful reward pursuit is mediated by the need for self-efficacy (Study 3), and moderated by participants' lay belief about the relationship between effort and self-efficacy (Study 3) and the assurance of self-efficacy through self-affirmation (Study 4).

4.5. STUDY 3: NEED FOR SELF-EFFICACY AS THE MEDIATOR AND EFFORT-EFFICACY BELIEF AS A MODERATOR

Study 3 had two main objectives. First, I aimed to provide process evidence for the proposed underlying mechanism of need for self-efficacy in the linkage between scarcity salience and consumers' effortful reward pursuit. Second, I intended to test the proposed moderating role of consumers' lay belief about the relationship between effort and efficacy. To do so, I employed a between-subject design with resource availability (scarcity vs. abundance) as the manipulated factor and participants' lay belief about to what extent greater effort evinces higher self-efficacy (Mirels and Garrett 1971) as the measured factor. Furthermore, Study 3 demonstrated the impact of scarcity salience in a marketing context in which participants indicated their intention to join a customer reward program that required consumer effort.

I predicted that scarcity salience would induce a need for self-efficacy, consequently enhancing participants' willingness to join an effortful customer reward program, only when participants held the belief that greater effort evinces higher self-efficacy. Yet, when participants

did not hold the belief about such a contingency between effort and efficacy, the effect of scarcity salience on the willingness to join the customer reward program would be attenuate.

4.5.1. Method

Two hundred and nine undergraduate students (M_{age} = 21.03, 71.3% female) took part in this laboratory study**.** Participants first finished the same manipulation of resource availability as in Study 1 and then responded to a five-item measure of their need for self-efficacy, on a 9-point scale (1 = strongly disagree, 9 = strongly agree; e.g., Bandura 2006; Lang and Fries 2006). In particular, participants indicated their opinions regarding these five statements: "I desire to achieve something in my life"; "I like situations in which I can show how capable I am"; "I am attracted by tasks which demonstrate my competence"; "I am striving to prove that I am 'good enough'"; and "I want to prove my worth".

Next, all participants took part in a seemingly unrelated consumer decision-making study. Specifically, participants imagined that a campus coffee shop was introducing a new customer reward program that required customers to download a smartphone app and enter a 10-digit validation code into the app to receive a $2 future discount after each purchase over $20. Participants indicated whether they would like to join this reward program or not.

In the final part, participants responded to a personality assessment questionnaire in which they indicated their belief about the relationship between effort and self-efficacy on five items using a 9-point scale (1 = strongly disagree, 9 = strongly agree; Mirels and Garrett 1971). In particular, participants reported their agreement with statements such as "if one works hard

enough he is likely to make a good life for himself" and "anyone who is able and willing to work hard has a good chance of succeeding".

4.5.2. Results

Willingness to join the effortful reward program. Participants' willingness to join the featured effortful customer reward program was coded as "1" if they chose to join the program, and "0" if not. A Chi-square test showed that resource availability significantly affected participants' willingness to join the program. Specifically, more participants chose to join the effortful customer reward program in the scarcity condition (80.2%) than in the abundance condition (66.0%; $\chi^2(1) = 5.35$, $p = .028$, $OR = 2.1$).

To examine whether participants' belief about the relationship between effort and self-efficacy moderates the observed effect, I averaged their ratings on the five belief items to create an index of participants' lay belief about the effort-efficacy contingency ($\alpha = .76$). High values indicated that participants held the belief that greater effort evinces higher self-efficacy, and low values indicated that participants did not hold such a belief. I ran a binary logistic regression with intention to join as dependent variable, and resource availability (scarcity vs. abundance), effort-efficacy belief (continuous measure), and the interaction term of the two as independent variables. The findings demonstrated a significant main effect of resource availability on willingness to join the effortful customer reward program ($\beta = -3.16$, $SE = 1.51$; $t(209) = -2.10$, $p = .036$). Importantly, the resource availability × effort-efficacy belief interaction was significant ($\beta = .70$, $SE = .27$; $t(209) = 2.60$, $p = .001$). Floodlight analyses (i.e., Johnson-Neyman analyses; Spiller et al., 2013) showed that this effect of resource availability on people's willingness to join

the effortful customer reward program was only significant for participants who believed that greater effort evinces higher self-efficacy (i.e., index higher than 5.44; 53.11% above; β = .65; *SE* = .33; *t* = 1.96; *p* = .05).

Mediation analysis. To examine how need for self-efficacy mediates the linkage between resource availability and effortful reward pursuit, I first averaged participants' reported scores on the five items used to measure need for self-efficacy to create an index of need for self-efficacy (α = .90), such that higher values indicated higher need for self-efficacy. Participants in the scarcity condition reported a higher need for self-efficacy (*M* = 7.00, *SD* = 1.06) compared to their abundance counterparts (*M* = 6.45, *SD* = 1.56; *F*(1, 207) = 8.91, *p* = .003).

Next, I ran moderated mediation analyses employing the bootstrapping procedure (with 5,000 resamples, PROCESS Model 15; Hayes, 2012), with willingness to join as the dependent variable, resource availability as the independent variable, need for self-efficacy as the mediator, and effort-efficacy belief as the moderator. The results revealed a significant moderated mediation pattern (β = .15, *SE* = .09; 95% CI = .0268 to .3727). Consistent with my predictions, the indirect effects at one standard deviation above the mean of the belief index (i.e., 6.95) were significant (β = .30, *SE* = .16; 95% CI = .0637 to .6826). By contrast, the indirect effects at one standard deviation below the mean of the belief index (i.e., 4.40) were not significant (β = -.10, *SE* = .13; 95% CI = -.4162 to .1076). These results suggest that need for self-efficacy mediated the impact of resource availability on people's willingness to join the effortful customer reward program only when participants held the belief that greater effort evinces higher self-efficacy, a mediation pattern that disappeared when participants did not hold such a belief.

4.5.3. Discussion

In line with my theorizing, Study 3 demonstrated that need for self-efficacy serves as a mediator of the observed effect. That is, reminders of resource scarcity (vs. abundance) induced a need for self-efficacy and consequently spur effortful reward pursuit. Furthermore, I demonstrated that the positive impact of scarcity salience on preference for effortful reward programs together with the mediating role of need for self-efficacy only emerged when participants considered effort to be an indicator of self-efficacy. To obtain further process evidence for the proposed theory, Study 4 tested whether experimentally satisfying the need for self-efficacy through self-affirmation moderates the impact of scarcity salience on effortful reward pursuit.

4.6. STUDY 4: SELF-AFFIRMATION AS A MODERATOR

The observed findings so far suggested that a feeling of resource scarcity spurs consumers' effortful reward pursuit in independent consumption contexts because of the heightened need for self-efficacy. Thus, if individuals' self-efficacy is acknowledged through other means such as self-affirmation before moving to the subsequent reward-pursuit context, they should exhibit decreased tendency to pursue effortful rewards, regardless of resource-availability perception.

Study 4 examined this hypothesis and adopted a 2 (resource availability: scarcity vs. abundance) × 2 (self-affirmation: present vs. control) between-subjects design. Specifically, I manipulated perceived resource level by using a reading-comprehension task as in Study 2 but in a different context. That is, participants read a news article that discussed either scarcity or

abundance of natural resources (Wu, Zhu, and Ratner 2018). Self-affirmation was induced by asking participants to describe several positive aspects of themselves (Blanton et al. 2001). I predicted that self-affirmation should weaken the observed effect of scarcity salience on effortful reward pursuit.

4.6.1. Method

Four hundred and seventy American adults (M_{age} = 37.0; 55.6% female) participated in this study. To manipulate resource availability, participants read a news article that highlighted either the scarcity or abundance of natural resources (Wu, Zhu, and Ratner 2018; see Appendix J). After reading the article, participants were asked to elaborate on how the content could be relevant to them and affect their personal life. Next, as an ostensibly independent study, half of the participants wrote about three or four positive aspects of themselves, or occasions in which they behaved positively (Blanton et al. 2001; self-affirmation condition), while the other half described three or four features of their immediate environment (control condition; see Appendix K). All participants then took part in a seemingly unrelated consumer decision-making study. More specifically, participants imagined that a supermarket chain offered a new reward program to its customers. If they joined this program, they would be rewarded a $2 rebate after each purchase over $20, but they would need to call customer service and provide a 10-digit validation code on their receipt in order to receive the monetary rebate after each purchase. After reading the information about the reward program, participants indicated whether they would like to join or not.

4.6.2. Results

Pretests. I pretested the effectiveness of the resource-availability manipulation employed in the main study with an independent sample of 92 participants (M_{age} = 36.24; 50.0% female). Specifically, participants first read one of the newspaper articles discussing either resource scarcity or resource abundance, as in the main experiment, and then responded to the same two items as in the pretest of Study 1. Results revealed that participants in the scarcity condition indicated that they perceived resources in their surrounding environment as more scarce (M = 6.92, SD = 2.11) than did their abundance counterparts (M = 4.90, SD = 2.65; $F(1, 90) = 16.51$, $p < .001$). Similarly, participants in the scarcity condition perceived resources in their surrounding environment as less abundant (M = 3.20, SD = 2.24) than did their abundance counterparts (M = 5.88, SD = 2.43; $F(1, 90) = 30.23$, $p < .001$).

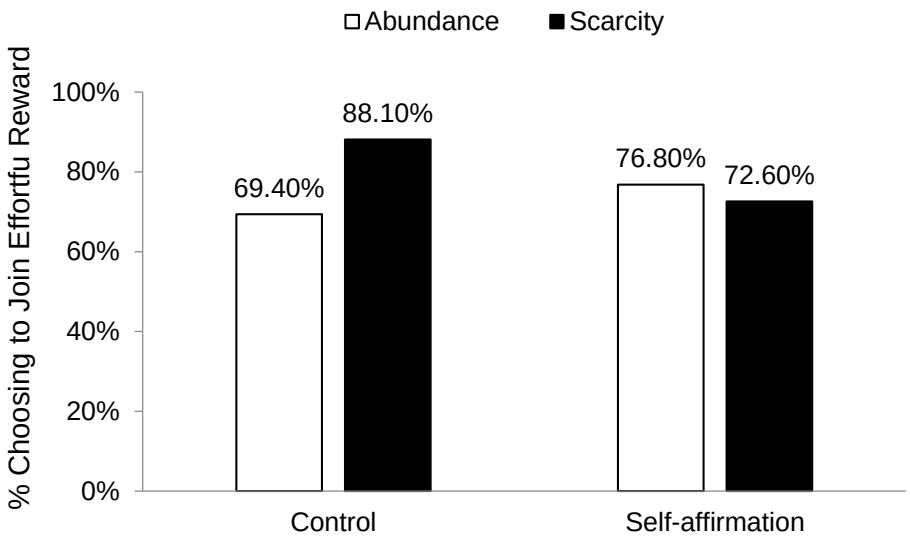
To ensure the effectiveness of the self-affirmation manipulation, I conducted a second pre-test with another separate sample of 73 participants (M_{age} = 33.90; 49.3% female). After administering the same writing tasks as used in the main study, I assessed participants' self-view using three items (Blanton et al. 2001): "The writing task on values made me think about things …"; 1 = I don't like about myself / I'm bad at / I don't value about myself, 9 = I like about myself / I'm good at / I value about myself; $\alpha = .92$). Participants in the self-affirmation condition viewed themselves more positively (M = 8.26, SD = 1.43) than did those in the control condition (M = 5.50, SD = 1.73; $F(1, 71) = 55.48$, $p < .001$).

Willingness to join the effortful reward program. Participants' willingness to join the effortful customer reward program was coded as "1" if they chose to join the program, and "0" if not. To examine whether self-affirmation moderates the impact of resource availability on

participants' intention to join the program, I ran a binary logistic regression in which I regressed the intention to join on resource availability, self-affirmation, and resource availability × self-affirmation. The findings demonstrated a significant interaction between resource availability and self-affirmation (β = .70, *SE* = .25; *Wald* = 8.19, *p* = .004, *OR* = 1.3; see Figure 5). As expected, in the control conditions where self-affirmation was absent, a significantly higher percentage of participants chose to join the effortful customer reward program in the scarcity condition (88.1%) than in the abundance condition (69.4%; $\chi^2(1) = 12.02$, *p* = .001, *OR* = 3.2). However, in the self-affirmation conditions where participants' sense of self-efficacy was ensured, the percentage of participants choosing to join the program showed no difference across the scarcity (72.6%) and abundance conditions (76.8%; $\chi^2(1) = .42$, *p* = .608).

FIGURE 5

IMPACT OF RESOURCE AVAILABILITY AND SELF-AFFIRMATION ON WILLINGNESS TO JOIN EFFORTFUL CUSTOMER REWARD PROGRAM – STUDY 4



4.6.3. Discussion

Study 4 supported the hypothesis that the presence of experimentally induced self-affirmation moderated the enhanced effortful reward pursuit caused by a feeling of resource scarcity, further supporting the proposed efficacy-based underlying mechanism. In particular, I demonstrated that the heightened need for self-efficacy resulting from scarcity salience increased consumers' willingness to join an effortful customer reward program when their self-efficacy was not experimentally ensured; yet this difference disappeared when self-affirmation ensured their self-efficacy.

4.7. SUMMARY

While prior studies suggested that people intuit a negative impact of resource scarcity on consumer effortful exertion in the reward-seeking process (Kluegel and Smith 1986; Smith and Stone 1989), understanding how and why a perception of resource scarcity (vs. abundance) might enhance or inhibit consumers' effortful reward pursuit in an independent consumption context has not been systematically studied. To address this gap, the current project examines how scarcity salience could produce a context-independent positive effect on consumers' effortful pursuit of rewards. Specifically, I explain that a feeling of resource scarcity activates a need for self-efficacy and consequently leads consumers to exert more effort in the reward-seeking process. Across four studies using both real behavioral and hypothetical measurements, I demonstrate the positive impact of resource scarcity (vs. resource abundance) on effortful reward pursuits, which is manifested as increased task persistence (Studies 1 and 2), enhanced

performance accuracy (Studies 1 and 2), and greater willingness to join effortful consumer reward programs (Studies 3 and 4). This effect occurs because a feeling of resource scarcity activates a need for self-efficacy and consequently leads consumers to exert more effort in the reward-seeking process (Study 3). Consistent with this proposed underlying mechanism, this observed effect disappeared when the effort-reward contingency was broken (Study 2), when consumers did not believe that greater effort evinces higher self-efficacy (Study 3), and when individuals' need for self-efficacy is satisfied through other means such as self-affirmation (Study 4).

This current project enhances our understanding in the research streams on scarcity, need for self-efficacy, and effortful reward pursuits. The findings extend previous research on general perceptions of scarcity—which has focused mostly on the cognitive, attentive, and physiological consequences of scarcity salience—by exploring the motivational impact of resource availability on effortful reward pursuits. While limiting availability of one particular type of resource has been shown to facilitate goal pursuit within that context (Moreau and Dahl 2005), the current work provides an initial demonstration that such a context-dependent effect of resource scarcity on effort exertion holds also in independent reward-seeking contexts and offers process evidence of why this occurs. That is, scarcity salience can induce a need for self-efficacy among consumers.

The current project contributes to the literature on need for efficacy, which has suggested numerous antecedents and consequences of need for efficacy (e.g., expectation and affect; Heckhausen 1993; Weiner 1986). Multiple lines of literature elaborate on a negative relationship between a feeling of resource abundance and consumer motivation, such as the research on materialism and hindered intellectual development (Kasser 2002), and the work on

overconsumption and failure of wealthy societies (Diamond 2005; Tainter 1990). No research had yet experimentally examined the causal linkage between resource availability and consumers' need for self-efficacy. The current research shows that a feeling of resource scarcity serves as an important antecedent of demonstration of one's efficacy.

In addition, the findings of this research further extend our understanding of effortful pursuits for reward from a consumer-psychology perspective. Existing research suggests a general negative impact of effort requirement on option desirability (Iyengar and Lepper 2000; Luce, Payne, and Bettman 1999; Schwarz 2004; Wänke, Bohner, and Jurkowitsch 1997). In marketing practice, especially for customer loyalty programs (e.g., Bagchi and Li 2011), perceived effort has often been viewed as an inconvenience inherent in complying with the marketing activities (Blattberg and Neslin 1990; Kivetz and Simonson 2002). However, the results suggest that consumer effort exertion for reward not only can be beneficial, it can be activated through subtle contextual factors, independent of the outcome expectation of marketing activities. In particular, I find that environmental cues that remind consumers of resource scarcity will induce a need for self-efficacy, consequently spurring consumers' effortful pursuits for reward in an independent consumption context. These results contribute to the emerging research on the potential silver lining of consumer effort (e.g., Olivola and Shafir 2013) by identifying the beneficial interaction between effort exertion for reward and scarcity salience on consumers' willingness to join a customer reward program, as well as their task persistence and performance accuracy.

The current work provides fruitful avenues for further research. I focus on one particular downstream consequence of need for self-efficacy: effortful reward pursuits in marketing contexts. Future research could explore other marketing consequences of need for self-efficacy,

such as heightened attention to product symbolism. It is plausible that this activated tendency to seek self-efficacy might increase consumers' conspicuous consumption or choice of more feature-rich products to strengthen their sense and show of ability. Additionally, I restrict the scope of the current research to scarcity salience that is induced by environmental cues or recall tasks. Future research investigating other socio-psychological factors that may lead to similar or differential effects on consumers' desire to prove their efficacy through effort exertion (e.g., deprivation history and social class) could also potentially yield important insights.

The current research provides implementable implications for utilizing employers' and consumers' motivations to pursue effortful rewards, by considering the level of effort embedded in marketing activities. The current findings suggest that activating a feeling of scarcity (e.g., reminders of a harsh environment or a busy workplace due to time constraints, or presentations of scarce rather than abundant supply of available items) could be an effective way to increase employees' persistence in exerting effort in work and in attracting consumers to join effortful brand-loyalty programs. Need for self-efficacy, according to these findings, is another factor that spurs consumers' effort exertion during the pursuit of rewards. To increase consumer's need for efficacy independently, companies could present more creative or challenging tasks to induce a feeling of curiosity and need to be skilled (La Guardia et al., 2000).

In addition, as found in Study 3, the observed positive impact of scarcity salience on effortful reward pursuits was stronger among people who hold the belief that effort should yield desired paybacks and self-efficacy. Previous research argues that the existence of such an effort-efficacy belief can be detected by eyeballing people's behavioral traits. For example, this effort-efficacy belief could be reflected in the efficiency of one's time usage (Greenberg 1978). Given today's advanced technology, the big-data approach allows companies to analyze consumers'

beliefs about the positive versus negative effort-efficacy link through their past consumption behaviors, and then customize appropriate reward programs to fit customers' idiosyncratic preferences.

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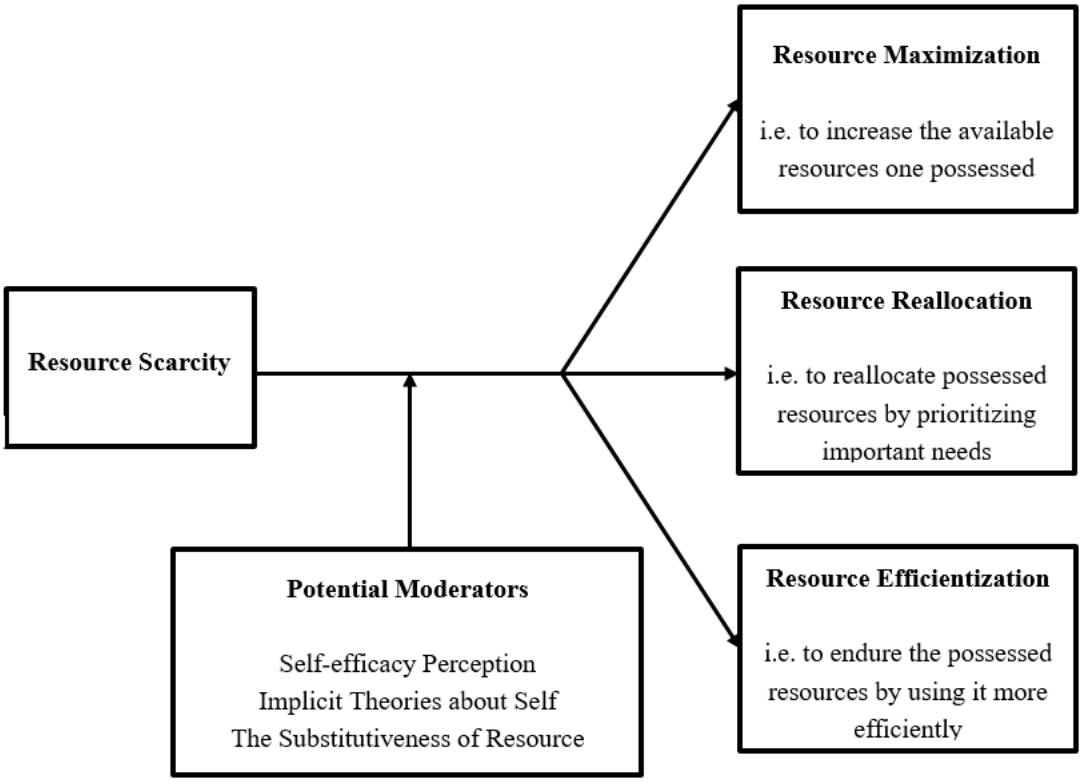
APPENDICES

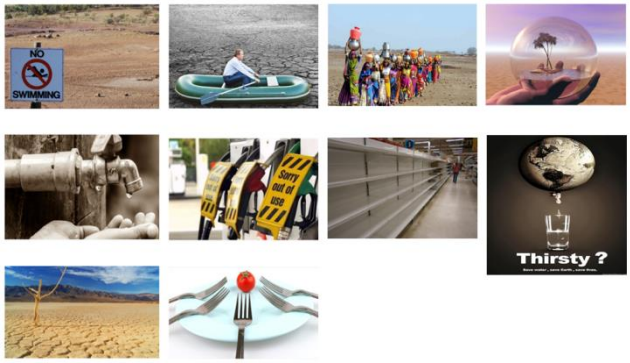
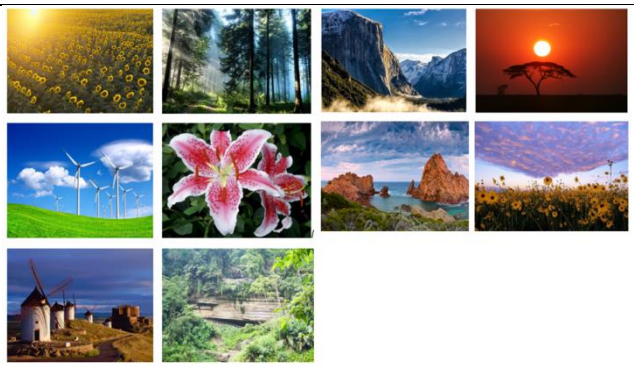
APPENDIX A

THE MAXIMIZATION-REALLOCATION-EFFICIENTIZATION (MRE) MODEL OF RESOURCE SCARCITY (IN CHAPTER 2)



APPENDIX B

RESOURCE SCARCITY MANIPULATION USED IN STUDY 1A (IN CHAPTER 3)

Resource-Scarcity Condition

Baseline Condition


APPENDIX C

RESOURCE SCARCITY MANIPULATION USED IN STUDIES 1B AND 2 (IN CHAPTER 3)

Resource scarcity condition
The Five Natural Resources Most Drained by Our 7 Billion People Here's something we can all worry about: The latest Living Planet Report indicates that humanity is now consuming resources at a pace that is 52 percent faster than what the Earth can renew. And that doesn't take into account the rate at which we are depleting non-renewable resources such as fossil fuels, minerals, and metals. With 7 billion people on the planet, there will be an inevitable increase in the demand on the world's natural resources. Here are five already under severe pressure from current rates of consumption: 1. Water Freshwater only makes 2.5% of the total volume of the world's water. But considering 70% of that freshwater is in the form of ice and permanent snow cover and that we only have access to 200,000 km3 of freshwater overall, it isn't surprising that demand for water could soon exceed supply. In many regions with high population levels (even in cities in the US), water supplies are already relatively sparse. In the next few decades, severe water scarcity could lead to humanitarian crises and chronic hardship, and set back our efforts to eradicate hunger and severe poverty. The Food and Agriculture Organization of the United Nations is predicting that by 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity. 2. Oil The BP Statistical Review of World Energy in June measured total global oil at 188.8 million tonnes, from proved oil resources at the end of 2010. This is only enough to oil for the next 45 years, should global production remain at the current rate. In the 2011 World Energy Outlook, the International Energy Agency claimed that an anticipated global oil demand of 104 million barrels per day in 2035 will be satisfied. Even if production manages for a time to top the 2010 level of 87 million barrels per day, the goal of 104 million barrels will never be reached and the world's major consumers will face virtual, if not absolute, scarcity. 3. Natural gas A similar picture to oil exists for natural gas, with enough gas in proven reserves to meet only 55 years of global production at the end of 2010. 4. Coal This has the largest reserves left of all the fossil fuels, but as China and other

developing countries continue to increase their appetite for coal, demand could finally outstrip supply. As it is, we have enough coal to meet only 180 years of global production.

5. Rare earth elements
Scandium and terbium are just two of the 17 rare earth minerals that are used in everything from the powerful magnets in wind turbines to the electronic circuits in smartphones. The elements are not as rare as their name suggests but currently 97% of the world's supply comes from China and they can restrict supplies at will.

Baseline Condition

Monkeys and Humans See Differently

Monkeys and their human cousins don't necessarily see the world the same way. In fact, some monkeys, even within the same species, see things differently from one another, according to new research from the Peruvian Amazon and a clever experiment from a lab in Scotland.

"As humans, we tend to think all creatures perceive the world the way we do, but that isn't the case," said Andrew Smith, a primatologist at the University of Stirling in Scotland. For nearly a decade, Smith and his colleagues have ventured into the Peruvian Amazon to study how different types of sight affected the foraging behavior of New World monkeys called tamarins.

Humans have so-called trichromatic, or three-color, vision. So do Old World species such as chimpanzees, gorillas, and orangutans. Trichromats have three types of light-sensitive cells in the retina, fine-tuned to wavelengths that appear blue, green, and red.

But New World monkeys have a broad range of vision types. Every howler monkey, for example, is trichromatic. The owl monkey is monochromatic, seeing only in black and white. Among tamarins and spider monkeys, all males are dichromats—they can't perceive reds or greens. But females split 60-40 between three- and two-color vision.

"You can have six individuals from the same species, even the same family, who see the world in six different ways," Smith said.

Tracking Tamarins
Like the one in 12 men who are colorblind, many New World monkeys have trouble discriminating between red and green, which can hamper the animals' ability to tell ripe fruit from raw.

Smith and his colleagues prowled the forests to follow the tamarins as they jumped from tree to tree high in the canopy. With a spectrometer, Smith measured the color of the fruit and the leaves on which the tamarins feed.

Tamarins eat the fruit of more than 833 plants from 167 different species. A favorite is the Abuta fluminum plant. Ripe Abuta is orange, like other fruits that the tamarins like. But orange is hard to detect without red-green perception.

Any advantage of Two-Color Vision?
"There may be some unidentified advantages to being a dichromat. Dichromats may be better at breaking the camouflage of predators and prey. New World monkeys, in addition to fruit, also consume large quantities of prey—katydids, frogs, and lizards. Perhaps dichromats are not as distracted by colors and better at seeing shapes and forms," Smith said.

Nature endows each way of seeing. Trichromats may be better at finding fruit; dichromats, at catching prey.

APPENDIX D

REGULATORY FOCUS SCALE USED IN STUDY 2 (IN CHAPTER 3)

Promotion/Prevention Scale

Using the scale below, please write the appropriate number in the blank beside each item.

1	2	3	4	5	6	7	8	9
Not at all true of me								Very true of me

1. _____ In general, I am focused on preventing negative events in my life.
2. _____ I am anxious that I will fall short of my responsibilities and obligations.
3. _____ I frequently imagine how I will achieve my hopes and aspirations.
4. _____ I often think about the person I am afraid I might become in the future.
5. _____ I often think about the person I would ideally like to be in the future.
6. _____ I typically focus on the success I hope to achieve in the future.
7. _____ I often worry that I will fail to accomplish my academic goals.
8. _____ I often think about how I will achieve academic success.
9. _____ I often imagine myself experiencing bad things that I fear might happen to me.
10. _____ I frequently think about how I can prevent failures in my life.
11. _____ I am more oriented toward preventing losses than I am toward achieving gains.
12. _____ My major goal in school right now is to achieve my academic ambitions.
13. _____ My major goal in school right now is to avoid becoming an academic failure.
14. _____ I see myself as someone who is primarily striving to reach my "ideal self"—to fulfill my hopes, wishes, and aspirations.
15. _____ I see myself as someone who is primarily striving to become the self I "ought" to be—to fulfill my duties, responsibilities, and obligations.
16. _____ In general, I am focused on achieving positive outcomes in my life.
17. _____ I often imagine myself experiencing good things that I hope will happen to me.
18. _____ Overall, I am more oriented toward achieving success than preventing failure.

APPENDIX E

RESOURCE SCARCITY MANIPULATION USED IN STUDY 3 (IN CHAPTER 3)

Resource-Scarcity Condition

NATIONAL GEOGRAPHIC

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Scarcity of Resources: Water and Food are Being Depleted

By Liz Langley, for National Geographic
PUBLISHED Mar 15, 2016

The Earth's natural resources like water and food are being depleted at an alarming speed, and we are facing a harsh future with scarce resources that threatens our survival, a recent study published by the New York University warned on Thursday.

Over the decade-long study of 37 major aquifers world-wide, 21 experienced a depletion of their water supply. About half of the global population could be facing water shortages by 2020 when demand would exceed water supply by 40 percent. As a result, in many countries people will be forced to drink low quality water from flowing streams, many of which are contaminated. More-over, there are many water-borne diseases that people can die of.

Populations will grow to 9.2 billion by 2025 and consequently double today's global food requirement, outgrowing growth in food production. Combined with unpredictable extreme weather patterns, droughts will haunt those people who are the most vulnerable, and lead to crop failures, food riots and war. Food prices will inevitably spike with a rising demand for protein foods such as meat, milk, fish and eggs.

"Water and food is running out much more quickly than we think," said Peter Montgomery, director at Department of Environmental Sciences of New York University.

Baseline Condition

NATIONAL GEOGRAPHIC

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Parrots: Are They the Humans in Bird's Realm?

By Liz Langley, for National Geographic
PUBLISHED Mar 15, 2016

Parrots are famous of their good imitators of human words and laughter. Actually, in addition to "speaking" human words, facts about them reveal that parrots are surprisingly similar to human beings.

Parrots live in the warm areas of the Southern Hemisphere. Australia, South America and Central America have the greatest diversity of parrot species. The most adapting habitat temperature is, like humans, around 75 °F (24 °C).

Most parrots are social birds that live in groups called flocks. African grey parrots live in flocks with 20 to 30 birds, a number that corresponds to the ideal number of people in a person's core social network. They are monogamous and spend their lives with only one mate. The mates work together to raise their young.

Parrots are also omnivores – they eat meat as well as vegetables, fruits and legumes. Most parrots eat a diet that contains nuts, flowers, fruit, buds, seeds and insects. Seeds are their favorite food. They have strong jaws that allow them to snap open nutshells to get to the seed that's inside.

Parrots are the most popular bird pets for human. The reason for this may not only be that they can talk like a human, but that they are actually the closest to humans in the bird's realm.

APPENDIX F

THE WORD-FRAGMENT COMPLETION TASK USED IN STUDY 3 (IN CHAPTER 3)

Suspicion Condition	
1. SUSP_ C _ OUS	(Suspicious)
2. D_UBT	(Doubt)
3. SUSP_CT	(Suspect)
4. DIS_RUST	(Distrust)
5. L_E	(Lie)
6. UNRELI_BLE	(Unreliable)
7. DISB_LIEVE	(Disbelieve)
8. Q_EST_ONABLE	(Questionable)
9. SHA_Y	(Shady)
10. WA_Y	(Wary)
Neutral condition	
1. TY_E	(Type)
2. COMP_NE_T	(Component)
3. CINE_A	(Cinema)
4. APP_E	(Apple)
5. M_P	(Map)
6. PH_NE	(Phone)
7. VEG_T_BLE	(Vegetable)
8. UNI_ER_ITY	(University)
9. FEBRU_RY	(February)
10.TRIA_GLE	(Triangle)

APPENDIX G

RESOURCE AVAILABILITY MANIPULATION USED IN STUDIES 1 AND 3 (IN CHAPTER 4)

Resource-Scarcity Condition
Please take the next 3 minutes to write about three or four situations where you felt that "**I don't have enough resources**" or "**my resources are scarce**". For each situation, please explain in detail what were lacking and what you experienced.
Resource-Abundance Condition
Please take the next 3 minutes to write about three or four situations where you felt that "**I have plenty of resources**" or "**my resources are abundant**". For each situation, please explain in detail what were abundant and what you experienced.
Control Condition
Please take the next 3 minutes to write about **three or four things that you did during the past week**. For each event, please explain in detail where you experienced.

APPENDIX H

LETTER REVERSE TASK USED IN STUDYIES 1 AND 2 (IN CHAPTER 4)

1. aeraer	21. jebqed	41. engfnd	61. lieafa	81. bvgfhr	101. lskdjf	121. jeuwhd	141. iugyft	161. rftgyh	181. lojugt
2. gsrsry	22. odkwen	42. kfjenw	62. grsghe	82. mxkdiu	102. nvbchd	122. kdienq	142. lkoity	162. eddcfv	182. nhujgt
3. hsrdrs	23. iejqle	43. menqie	63. helbrh	83. bdhekq	103. yushet	123. ueiqoe	143. vgfthu	163. xsswde	183. oltgvf
4. sgrhsh	24. pqoedd	44. lwrsfd	64. meudns	84. ueyrgf	104. lsoeiq	124. nvhdya	144. lkftse	164. swwsbg	184. jukicd
5. bagrhi	25. mencsl	45. jgnbuw	65. odjemw	85. wesdfc	105. nfhdye	125. kdieoq	145. cvtyiu	165. jukihy	185. swgthg
6. lgieln	26. iqpemd	46. lskems	66. lgmeiq	86. kdifuy	106. bsgeyw	126. leoqmd	146. cdfgyh	166. edbgnh	186. xscdgt
7. xhthth	27. menxuc	47. mbjfuq	67. lfneuq	87. nvhfjr	107. uinequ	127. meodjq	147. vbnjhu	167. degtju	187. yhgbfv
8. tdjhrs	28. prkrns	48. udyeie	68. auddmq	88. pdoeiw	108. oeudjg	128. lspqnd	148. erhuji	168. omjnh	188. mjkiyh
9. lfyibd	29. yqueks	49. oeowks	69. pelqme	89. pdoemq	109. lsoepq	129. bvgfuq	149. sdftgy	169. edgthy	189. edgtyh
10. kuhliu	30. jguehs	50. mdteiw	70. ydnebq	90. nvhfkd	110. meodls	130. lspemq	150. mkhjy	170. gthynh	190. qaswbg
11. kuhlib	31. mdnsoq	51. bdjfts	71. psmeng	91. jdufnd	111. bnfhwy	131. ieoqpe	151. hubdhe	171. xsdegt	191. cdgtfr
12. ihlbge	32. odensk	52. kgmeqm	72. empgiq	92. gfhdys	112. lskeiq	132. hgyfid	152. gyftdr	172. nhmjki	192. dsgftr
13. uhlihe	33. khmgur	53. yeiqod	73. psenxu	93. kvydhs	113. poekdm	133. oplkhg	153. jinjvg	173. devfbg	193. edhyju
14. hfneos	34. idmghv	54. kodwmd	74. ixuvne	94. lsidkw	114. lsoepq	134. fgrtcv	154. yguhrd	174. cdfrde	194. eferju
15. menhur	35. ueggsj	55. bdkemq	75. piemqu	95. mvniq	115. cbnhuo	135. hjrtdf	155. koijes	175. swxsnh	195. dehyju
16. nvhjel	36. pfkrug	56. oqkemd	76. ysucne	96. agdteb	116. oosueq	136. sdhjiu	156. xdsegy	176. gtjuki	196. bgnhju
17. ufnfjs	37. mbneuq	57. neuqos	77. mvuwqd	97. dvcgfh	117. jheuqo	137. vfhyju	157. vgbhxd	177. ednhyh	197. eddwqs
18. oeldjf	38. oeidjf	58. mekdls	78. cvdgey	98. ytfjsi	118. llkeiq	138. desdcf	158. debgnh	178. swzafv	198. vfhyju
19. mwndu	39. ieudje	59. nebupq	79. nvbfgr	99. ksoelv	119. nvudqo	139. kihuft	159. defrjy	179. yhkinh	199. edgtlo
20. oekfuf	40. lgjfnv	60. mukiyl	80. mbjgut	100. muftgh	120. vcfdge	140. lkcfre	160. swcdfr	180. edujik	200. xscdfr

APPENDIX I

RESOURCE AVAILABILITY MANIPULATION USED IN STUDY 2 (IN CHAPTER 4)

Resource-Scarcity Condition

Earlier this year we helped the Student Union conduct a research about our library service. Now the results are out and we find that our library is in fact the most resource scarcity library in the region, compared to other university libraries.

Now we'd like to give you more information about our findings. On the following screen, you will read an article about this research. Please read it carefully and answer question that followed.

Please click on continue to read the article.

<Page Break>

Our Library— One of The Most Resource-Scarce University Library in The Region

In the research conducted, we used three criteria to judge the resource availability of each university library: the size of book collections, study space availability, and the number of librarians. After a carefully examination of all three criteria, we reached the following conclusion:

Compared with other university libraries, **our library is the most resource-scarce university library in the region.**

With around 35,000 people (includes 31,000 students and 4,000 staff), there will be an inevitable increase in the demand on library resources in the future. However, the current facility of our library will not be able to meet such a huge demand

1. Book Collections:
Our library's book collections are **far less** than those in other university libraries. "I can't find the book I need in our library" is the most common complaint that our students have.

Our library holds only 2.8 million volumes and 2 million eBooks, while University X library has over 6.7 million printed book and 8 million eBooks available, and the library of University Y has over 4.5 million printed pieces and provide access to more than 3 million electronic books.

2. Study Space:
Our library only has 1,589 study spaces for our 31,000 students. In other words, **only 5% of**

our students are able to find a quite spot to study in the library. This study-space-to-student ratio of our library is the **lowest** in the region. During the busy exam period, students have to queue for hours in order to find a place to study. And the 24-hour study center in the library does not have enough study tables for students, so it is always overcrowded.

3. Librarians:
Our library has faced budget constraints for a long time, resulting in a severe lack of enough librarians. Compared with other university libraries, our library has the **smallest number** of librarians.

Other university libraries offer many different contact methods between librarians and students, such as phone, email, WhatsApp, in-person, etc. However, **our librarians can only be reached via email or in-person**. Given these limitations, our students are not able to get adequate or timely responses.

Resource-Abundance Condition

Earlier this year we helped the Student Union conduct a research about our library service. Now the results are out and we find that our library is in fact the most resource abundant library in the region, compared to other university libraries.

Now we'd like to give you more information about our findings. On the following screen, you will read an article about this research. Please read it carefully and answer question that followed.

Please click on continue to read the article.

<Page Break>

Our Library— One of The Most Resource-Abundant University Library in the region.

In the research conducted, we used three criteria to judge the resource availability of each university library: the size of book collections study space availability, and the number of librarians. After a carefully examination of all three criteria, we reached the following conclusion:

Compared with other university libraries, **our library is the most resource abundant university library in the region.**

1. Book Collections:
Our library's book collections encompass a rich and varied universe of printed volumes, digital resources, maps, media and archival materials, is **one of the largest book collections** in the region.

The library holds over 8 million volumes and over a million eBooks. With close to 5 million journal article downloads per year and 91 percent of the 120,000 current serial titles available online, the library's digital collection continues to grow at a rapid pace, providing access to resources worldwide.

2. Study Space:
Our library has **the highest study place to student ratio** among university libraries in the region. That is, our students are easier to find a quite spot to study in the library than those in other universities. Since the library renovation in 2014, the 24-hour study center in the library has been expanded to two floors and now it provides twenty-one study rooms for group discussions.

3. Librarians:
Compared with other university libraries, our library also has **the largest number of librarians** who provide outstanding services to students, emphasizing the speed and convenience of service and the enhanced productivity it brings. To respond student

request in a timely manner, librarians offer many different ways for students to contact them, such as phone, email, WhatsApp, in-person, etc.

APPENDIX J

RESOURCE AVAILABILITY MANIPULATION USED IN STUDY 4 (IN CHAPTER 4)

Resource-Scarcity Condition

In this study, you will be asked to read a summary of a recent newspaper article about resource scarcity. Please take a few minutes to read the article, and write about how the phenomenon described in the article would be relevant to you and affect your personal life. Please click on continue to read the article.

<Page Break>

The Five Natural Resources Most Drained by Our 7 Billion People

Here's something we can all worry about: The latest Living Planet Report indicates that humanity is now consuming resources at a pace that is 52 percent faster than what the Earth can renew. And that doesn't take into account the rate at which we are depleting non-renewable resources such as fossil fuels, minerals, and metals.

With 7 billion people on the planet, there will be an inevitable increase in the demand on the world's natural resources. Here are five already under severe pressure from current rates of consumption:

1. Water

Freshwater only makes 2.5% of the total volume of the world's water. But considering 70% of that freshwater is in the form of ice and permanent snow cover and that we only have access to 200,000 km3 of freshwater overall, it isn't surprising that demand for water could soon exceed supply. In many regions with high population levels (even in cities in the US), water supplies are already relatively sparse. In the next few decades, severe water scarcity could lead to humanitarian crises and chronic hardship, and set back our efforts to eradicate hunger and severe poverty. The Food and Agriculture Organization of the United Nations is predicting that by 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity.

2. Oil

The BP Statistical Review of World Energy in June measured total global oil at 188.8 million tonnes, from proved oil resources at the end of 2010. This is only enough to oil for the next 45 years, should global production remain at the current rate. In the 2011 World Energy Outlook, the International Energy Agency claimed that an anticipated global oil demand of 104 million barrels per day in 2035 will be satisfied. Even if production manages for a time to top the 2010 level of 87 million barrels per day, the goal of 104 million barrels will never be reached and the world's major consumers will face virtual, if not absolute, scarcity.

3. Natural gas

A similar picture to oil exists for natural gas, with enough gas in proven reserves to meet only 55 years of global production at the end of 2010.

4. Coal

This has the largest reserves left of all the fossil fuels, but as China and other developing countries continue to increase their appetite for coal, demand could finally outstrip supply. As it is, we have enough coal to meet only 180 years of global production.

5. Rare earth elements

Scandium and terbium are just two of the 17 rare earth minerals that are used in everything from the powerful magnets in wind turbines to the electronic circuits in smartphones. The elements are not as rare as their name suggests but currently 97% of the world's supply comes from China and they can restrict supplies at will.

Resource-Abundance Condition

In this study, you will be asked to read a summary of a recent newspaper article about resource abundance. Please take a few minutes to read the article, and write about how the phenomenon described in the article would be relevant to you and affect your personal life.
Please click on continue to read the article.

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The Growing Abundance of Natural Resources

There are three means by which to judge the extent of our resource base: proven reserves, price data, and ultimately recoverable stock. If we examine the earth's resource base using those three yardsticks, we do come to a promising conclusion: the global economy witnessed the greatest explosion of resource abundance in the history of mankind. In other words, we face unprecedented resources abundance. Here is some evidence:

1. Water:

Water is one of the most abundant resources on earth. About 71 percent of the Earth's surface is water- covered. If all of Earth's water was put into a sphere, then the diameter of that water ball would be about 860 miles. Water resource is abundant in the United States. The country has 4.5 percent of the world's population yet almost 8 percent of its freshwater resources. It is home to the largest freshwater lake system in the world, the Great Lakes, which holds 6 quadrillion gallons of water. And the mighty Mississippi River flows at 4.5 million gallons per second at its mouth in New Orleans, supplying water to about 15 million people.

2. Oil:

The world has nearly 10 times the amount of proven oil reserves that it had in 1950 and almost twice the known reserves of 1970. In fact, proven oil reserves are greater today than at any other time in recorded history. Oil prices have dropped 35 percent in constant dollars since 1980. When indexed to U.S. wages, oil prices have dropped 43 percent. Whereas 3.2 percent of total household expenditures were devoted to gasoline in 1972, American households today devote but 2.6 percent of total expenditures to gasoline purchases.

3. Natural Gas

Proven natural gas reserves have also shown dramatic increases in the past 20 years; they have increased by 84 percent since 1974. At current rates of consumption, proven gas reserves alone will be sufficient for approximately 60 years.

4. Coal

In the last decades proven coal reserves grew by 84 percent, an amount sufficient for 238 years given current levels of consumption. Since 1980 the price of coal has dropped 91 percent when adjusted for inflation and 243 percent when indexed to U.S. wages.

5. Rare earth elements
Examination of rare earth mineral resources indicates that we have only begun to tap the rich veins of the earth's abundance. Scandium and terbium are just two of the 17 rare earth minerals that are used in everything from the powerful magnets in wind turbines to the electronic circuits in smartphones. The elements are not as rare as their name suggests. According to natural resources experts, many of the materials we rely upon in modern life won't "run out" at all.

APPENDIX K

SELF-AFFIRMATION MANIPULATION USED IN STUDY 4 (IN CHAPTER 4)

Self-affirmation Present Condition
Please write about **three or four positive aspects of yourself, or occasions in which you behaved positively.** Please explain why these aspects are important to you. They can be any aspects of your identity, a talent, a relationship, or a basic value.
Self-affirmation Absent Condition
Please list **three or four features of your immediate environment**. They can be any feature of your surroundings.