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Scarcity, engagement, and value

Steen Sehnert · Becca Franks · Andy J. Yap ·
E. Tory Higgins

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Abstract Scarcity has been found to intensify value, positive or negative, rather than simply enhancing it. Some researchers have proposed that scarcity affects value by increasing how much attention is paid to a stimulus. We conceptualized sustained attention as stronger engagement and operationalized *a situation of scarcity* by telling participants who were choosing between two objects that the object that was chosen would then be replaced (Replenish) or not replaced (Scarce). To distinguish sustained attention–stronger engagement in a situation of scarcity from grabbing attention (salience from distinctiveness), the choice was between one option with a single instance (solitary-high salience) and a second option with several duplicates (abundant-low salience). We predicted that stronger engagement from a situation of scarcity would, first, intensify the value of the chosen item regardless of whether it was solitary or abundant, with positive items becoming more positive and negative items becoming more negative, and second, the stronger engagement from the situation of scarcity would transfer intensification to another *separate* object in the same setting. The results of Studies 1 and 2 supported both of these predictions. Study 3 tested a boundary condition for these scarcity–engagement effects in terms of how real participants experienced the choice items to be, where ‘realness’ is another source of engagement strength. As expected, the scarcity–engagement effect on intensifying value was replicated for participants who

experienced the activity as real but was eliminated for those who did not.

Keywords Scarcity · Attention · Salience · Engagement · Motivation · Value

The merit of an object, which is in any degree either useful or beautiful, is greatly enhanced by its scarcity.

Adam Smith (1937).

Introduction

It has long been recognized that scarcity can enhance value. There has been a rich history of research on the relation between scarcity and value, starting with evidence that scarcity can enhance the value of an object (Brock 1968; Cialdini 1985; Fromkin 1970; Fromkin and Brock 1973; Lynn 1987; Worchel et al. 1975; Verhallen 1982; Zellinger et al. 1975). It subsequently became clear that scarcity does not only affect the value of desirable things. Research demonstrated that, rather than simply enhancing value, scarcity can intensify evaluative responses for negative events as well in contexts like person attribution (Frieze and Weiner 1971), intimate self-disclosure (Petty and Mirels 1981), reaction to medical diagnoses (Ditto and Jemmott 1989), and persuasive communication (Bozzolo and Brock 1992). In a special issue concerned with such intensification effects of scarcity, several possible underlying mechanisms were proposed (Pratkanis and Farquhar 1992), including increased attention (Bozzolo and Brock 1992; Brock and Brannon 1992; Folger 1992). Notably, in some cases the increased attention was described in terms of greater sustained attention (e.g., Bozzolo and Brock 1992), whereas in other cases enhanced salience drawing attention was emphasized (Folger 1992; Pratkanis and Farquhar 1992).

S. Sehnert · B. Franks · E. T. Higgins (✉)
Department of Psychology, Columbia University,
1190 Amsterdam Avenue, New York, NY 10027, USA
e-mail: tory@psych.columbia.edu

A. J. Yap
Massachusetts Institute of Technology, Cambridge, MA, USA

The proposal that scarcity increases attention, which then intensifies evaluative responses, has important implications when viewed through the lens of regulatory engagement theory given that engagement is defined in terms of sustained attention (Higgins 2006; Higgins and Scholer 2009). The major purpose of our research was to investigate two implications that have not been tested directly. First, if a situation of scarcity strengthens engagement, then a situation of scarcity should make a positive object more positive and a negative object more negative, and if these effects derive from ‘engagement-sustained attention’ rather than ‘salience-drawing attention’, then the scarcity effect should occur independent of whether the chosen object has high or low salience. Second, and more important, if creating a situation of scarcity strengthens engagement, then it should be possible to manipulate scarcity using one set of objects, and then observe intensification effects on a completely separate object, as long as that separate object is present within the same setting.

Early research on scarcity

Brock’s (1968) commodity theory stated that ‘any commodity will be valued to the extent that it is scarce, unavailable, or difficult to attain.’ Researchers found support for this claim using consumer products like women’s apparel (Fromkin 1970), cookies (Worchel et al. 1975) cookbooks (Verhallen 1982), censored desirable materials (Fromkin and Brock 1973; Zellinger et al. 1975), and paintings (Lynn 1987). Adding scarcity to positively valenced objects increased their value.

Research in communication began to suggest that adding scarcity to a communication *intensifies* the evaluative response to that communication even when the response is negative (Bozzolo and Brock 1992; Ditto and Jemmott 1989; Frieze and Weiner 1971). In order to reconcile these opposing effects of scarcity on value, Brock and Brannon (1992) liberalized commodity theory, extending its scope to messages, experiences, traits and skills, and negative objects, granting that commodifying factors *polarize* evaluative responses. Adding scarcity to (positive) products *enhanced* their value, but adding scarcity in many other areas *intensified* both positive *and* negative value.

This intensification research also helped reveal a mechanism underlying scarcity’s effects on value. Ditto and Jemmott (1989) brought participants into a physician’s office and diagnosed them all with a medical condition called thioamine acetylase, a non-existent medical condition invented for use in this study. Participants were randomly assigned to one of four descriptions of this medical condition: thioamine acetylase was rare (vs. common), and had positive (vs. negative) consequences for human health, creating a 2 (prevalence: rare/common) \times 2 (health consequences: negative/positive) factorial design. After being

diagnosed with thioamine acetylase, patients in the *positive* health condition judged the disease to be *more healthful* when told it was rare than common. In contrast, patients in the *negative* health condition judged the disease to be *less healthful* when told it was rare than common. Among participants in the negative health condition, those who believed it was rare not only reported experiencing more fear and anxiety about having the condition, but they also sought out more information about the medical condition than participants who believed it was negative but common.

This work was among the first to identify a mechanism associated with the polarization effects found in the scarcity literature. It demonstrated that scarcity increased the likelihood participants would request additional information in positive *and* negative valence conditions, suggesting that scarcity causes people to exert *more attentional resources*. Researchers used the area of persuasive communication to build on this discovery and examine the effect of scarcity and valence on the value of a persuasive message.

Bozzolo and Brock (1992) tested scarcity’s ability to increase participants’ attention to strongly and weakly argued messages, and found that participants reading scarce (vs. nonscarce) messages (i.e., manipulating the degree to which access to a message is restricted) showed higher ratings of perceived effort. Researchers in this area proposed that scarcity attracts attention and sustains attention, including increasing motivation to scrutinize, process, and elaborate (Bozzolo and Brock 1992; Brock and Brannon 1992; Folger 1992). Research in the domain of products has supported this understanding that scarcity increases attention, and that increased attention intensifies evaluative reactions to stimuli. Some research has found, for example, that scarce packaging design, i.e., packaging that deviates from that same product’s usual packaging, increases the amount of attention participants pay to the product in an experiment (Schoormans and Robben 1997). However, the possible effects from the scarcity of one set of objects on evaluative reactions to a separate object have not yet been considered. The purpose of our research was to investigate these issues using regulatory engagement theory (Higgins 2006) as our guide.

Regulatory engagement and value

Our research was inspired by the scarcity literature’s proposal that scarcity sustains attention to a target because regulatory engagement theory (RET) defines engagement in terms of *sustained attention*: “The state of being engaged is *to be involved, occupied, and interested in something. Strong engagement is to concentrate on something, to be absorbed or engrossed with it.* (Higgins 2006, p. 442, italics in the original)”. RET proposes that value is

a motivational force experience (cf. Lewin 1951). Experiencing something as having positive value corresponds to experiencing attraction toward it (e.g., trying to move toward it) and experiencing something as having negative value corresponds to experiencing repulsion from it (e.g., trying to move away from it). As a motivational force experience, the value experience varies not only in direction but also in intensity (i.e., weak or strong intensity). Importantly, although direction and intensity as force experiences are experienced holistically, they are distinct from one another with respect to their sources. Specifically, there can be a variable that contributes to value intensity without contributing to value direction. And strength of engagement is one such variable—stronger engagement intensifies positive and negative reactions without itself determining whether the reaction is positive or negative. The sustained attention involved in engagement refers to recruiting resources when maintaining attention to an object or activity, and the motivational force experience of attraction or repulsion is intensified by this resource recruitment.

In our lab, engagement strength has been measured in a number of different ways, including task persistence (e.g., Förster et al. 1998), increased attention to a task (e.g., Bianco et al. 2003; Cesario and Higgins 2008), and task performance (e.g., Bianco et al. 2003; Shah et al. 1998). Our research has also found that when people are strongly engaged in what they are doing, they respond more positively to a positive object or event and more negatively to a negative object or event.

As one example of how strength of engagement in what you are doing can affect the positivity of a positive target, Higgins et al. (2012) examined the impact of engagement on the value of a prize. Adverse background noises played while participants worked to solve enough anagrams to win a prize, and strength of engagement in the prize-related work depended on how the participants were instructed to deal with the adversity. When people encounter adversity in goal pursuit, they can either redouble their focus on the task at hand—e.g., the kind of response to difficulty that Woodworth (1940) described as resistance, such as leaning into a wind that is impeding your progress—or they can direct their attention away from the task at hand and attend instead to something else, such as their unpleasant feelings. In the Higgins et al. (2012) study, the participants were instructed to deal with the noise either by “opposing” it as an interference or by “coping” with the unpleasant feelings it created. Poorer recognition of the content of the background noise was used to check that participants did indeed follow instructions by paying attention to the opposing or coping response rather than to the background noise.

For the “opposing” participants, we predicted that following instructions would strengthen engagement in

solving the anagrams to win the prize because opposing an interfering force strengthens engagement in what you are doing (Higgins 2006). This prediction parallels Woodworth’s example of opposing the wind that is interfering with your forward progress causing you to concentrate even more on the focal task of moving forward. In our experiment, we predicted that increased concentration on the focal, prize-related task should enhance the value of the prize from stronger engagement intensifying its positivity. For the “coping” participants, we predicted that following instructions would *weaken* engagement in solving the anagrams to win the prize because the more they attended to coping with their unpleasant feelings, the less able they would be to sustain attention on the focal, prize-related task (i.e., disruption of sustained attention from divided attention). The resulting weakening of engagement in the focal task would de-intensify the positivity of the prize (i.e., decrease its value). Both of these predictions were supported. [For another perspective on the interrelation among adversity, engagement, and value enhancement, see also Brehm et al. (1983) discussion of how adversity can mobilize energy for task engagement. We will discuss this model more in the General Discussion as it relates to what we found in the present studies.]

There is also support for this engagement-intensification link in other areas of research on value. Research supporting regulatory engagement theory (RET) (Higgins 2006) has demonstrated that stronger engagement intensifies evaluative responses in areas ranging from consumer products to persuasive communication (e.g., Cesario et al. 2004; Higgins and Scholer 2009; Lee and Aaker 2004). To the extent that scarcity strengthens engagement by sustaining attention to the focal situation, RET predicts value intensification in situations of scarcity.

A situation of scarcity

In three experiments, participants chose between two consumer objects. We operationalized the scarcity–engagement link in terms of telling participants that the object that was chosen would then be replaced (Replenish) or not replaced (Scarcity). Knowing that the chosen object would not be replaced creates a decision situation with an interfering force that must be opposed to continue with the decision-making process, and RET proposes that opposing an interfering force strengthens engagement in the current activity (Higgins 2006). RET predicts that this strengthened engagement will intensify the value of whichever object is chosen. As mentioned earlier, this strong engagement-sustained attention proposal is different from a salience-drawing attention proposal. To examine the role of salience attention independent of sustained attention, all of the experiments involved choosing between one option

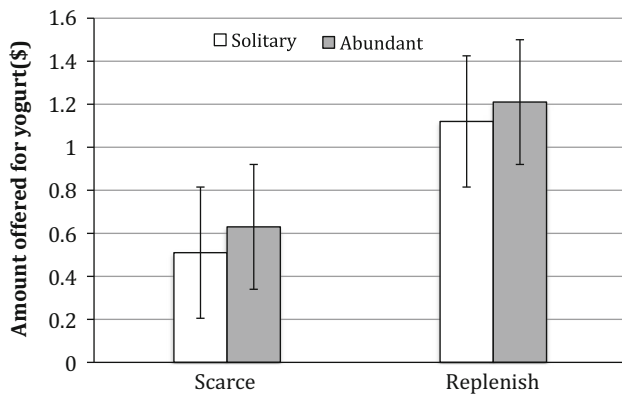


Fig. 1 Study 1. Payment offered for a disliked yogurt as a function of condition (Scarce or Replenish) and yogurt chosen by participant (Solitary or Abundant)

with a single instance (solitary-high salience) and a second option with several duplicates (abundant-low salience). RET predicts a value intensification effect regardless of whether the solitary or abundant option is ultimately chosen because the situation of scarcity involves both options (Studies 1–3). We should note, however, that this does not preclude the possibility that there could be an additional effect on value from high versus low salience.

There is an additional implication of combining the scarcity–sustained attention link with the engagement–intensification link. If the ‘not replace’ condition creates a situation of scarcity, then an object that is in the same setting as the scarce objects, although separate from them, might also be susceptible to intensification from the stronger engagement produced by the situation of scarcity. This implication is tested in Study 2. Study 3 examines whether value intensification from stronger engagement in a situation of scarcity also depends on the extent to which the objects in the situation of scarcity are experienced as real, where ‘realness’ is another source of engagement strength (Higgins 2012).

Study 1

Method

Fifty-two university students (25 women and 27 men) participated for pay. We presented each participant with a tray containing cups of yogurt: several cups of one kind of yogurt (abundant) and one cup of another kind (solitary). Unbeknownst to the participants, all cups contained the same slightly bitter yogurt, which was predetermined to be

mildly disliked. The participants were randomly assigned to either the *Scarce* condition or the *Replenish* condition. In the *Replenish* condition, the participants were told that whichever cup of yogurt they chose would be replaced by another cup of the same yogurt for the next participant in the study. In the *Scarce* condition, the participants were told that the cups of yogurt on the tray were all the yogurt cups that were left, and whichever cup they chose would not be replaced, creating high scarcity for the solitary cup. We then asked participants to choose one cup of yogurt, take one bite from that cup, and evaluate it. The participants were debriefed, thanked, and paid for their participation.

Results

We did not expect participants to choose the solitary cup more than one of the abundant cups in either the Scarce or Replenish condition because previous research has shown that even when people value a solitary item more than abundant items, they tend not to choose it because of politeness considerations (Lesourne 1979; Lynn 1991; Shippee et al. 1981; Verhallen and Robben 1994). Indeed, in neither the Scarce nor the Replenish conditions was the solitary item chosen more than the abundant item ($\chi^2(1, N = 53) < 1$).

The participants disliked the yogurt. We asked them, ‘Given that a normal cup of yogurt costs \$2.50, how much would you be willing to pay for a cup of the yogurt you just sampled?’ The average price offered was \$.80, and 86.5 % of participants offered less money than the \$2.50 normal price, thus confirming that the yogurt was generally disliked.

Regardless of which yogurt participants chose, participants in the Scarce condition offered significantly *less* money—approximately only half as much money—for the yogurt than participants in the Replenish condition (controlling for age and gender), $t(52) = 2.31, p = .03$, and this difference was found among those participants who chose the solitary cup (Scarce condition, $M = $.51, SD = .49$; Replenish condition, $M = $1.12, SD = 1.2$) and among those participants who chose one of the abundant cups (Scarce condition, $M = $.63, SD = .75$; Replenish condition, $M = $1.21, SD = 1.14$) (Fig. 1). There was no significant effect of solitary versus abundant and no significant interaction between this salience variable and the scarcity variable, both $F_s < 1$. For the situation of scarcity in this study, then, it appears that it is stronger engagement–sustained attention rather salience-drawn attention that underlies the scarcity effect on value.



Fig. 2 Study 2. Payment offered for a liked product as a function of experimental condition (Scarce or Replenish) and product chosen by participant (Solitary or Abundant)

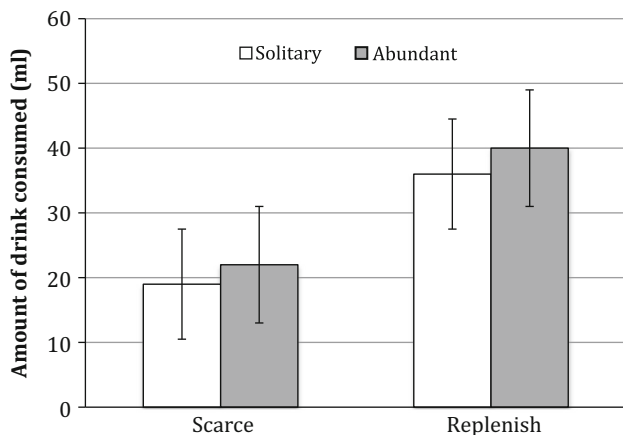


Fig. 3 Study 2. Milliliters of disliked drink consumed (ml) as a function of experimental condition (Scarce or Replenish) and product chosen by participant (Solitary or Abundant)

Study 2

Study 2 sought to extend the results of Study 1 by showing an intensification effect of scarcity for both a liked object and a disliked object, while also demonstrating that the scarcity involved in one set of objects can impact the value of a separate ‘unrelated’ object in the same setting, as suggested by RET.

Method

Forty-seven students in a university research pool (29 women and 18 men) participated for pay. We presented participants with a tray containing an array of one type of

product (half the participants saw pens, the other half saw notebooks). Participants either chose between two types of pens (one type solitary and one type abundant) or two types of notebooks (one type solitary and one type abundant). As in Experiment 1, there were replicates of one version (abundant) and a single instance of another version (solitary). We told half the participants that whichever product they chose would be replaced by another of the same kind (*Replenish*), and we told the other half that their chosen product would not be replaced (*Scarce*). The participants first chose and evaluated a product, using a 15-item Likert-type scale (−7 = dislike it very much, 7 = like it very much). Next, using the same dependent measure as in Experiment 1, the participants stated how much money they were willing to pay to buy the product they chose. For the second “unrelated” product, the participants next tried a distasteful drink (either watered-down Kool Aid® or watered-down tomato juice, which piloting indicated were evaluated negatively), and we recorded *how much they drank* as the dependent measure. The participants were then debriefed, thanked, and paid for their participation.

We predicted that participants in the *Scarce* condition would offer to pay more for the first, liked product, regardless of whether they chose the abundant (six items) or solitary (one item) version of the product. We also predicted that the situation of scarcity established for the first product would spread to the second “unrelated” product, intensifying the negative value of the watered-down drink, causing participants in the *Scarce* condition to drink *less* of the mildly disliked drink.

Results

Evaluations confirmed that our participants liked the first product they received ($M = 3.15, SD = 3.06$). As in Experiment 1, the solitary item was not chosen more than the abundant item in either the Scarce or the Replenish condition, $\chi^2(1, N = 47) < 1$. Controlling for age, gender, and product type (pens or notebooks), we found participants were willing to pay more for the first liked product in the *Scarce* condition $t(47) = 1.84, p = .07$, and this difference was found among those participants who chose the solitary cup (*Scarce* condition, $M = \$1.47, SD = .57$; *Replenish* condition, $M = \$1.11, SD = .54$) and among those participants who chose one of the abundant products (*Scarce* condition, $M = \$1.39, SD = .59$; *Replenish* condition, $M = \$1.23, SD = .54$) (Fig. 2). There was no significant effect of solitary versus abundant and no significant interaction between this salience variable and the scarcity variable, both $F_s < 1$.

Of particular importance, participants in the *Scarce* condition drank significantly *less* of the unrelated, distasteful drink than participants in the *Replenish* condition,

$t(17) = 2.16, p = .04$. On average, participants in the Replenish condition drank 38 (± 7.3) ml while participants in the Scarce condition drank 21 (± 3.6) ml—45 % less in the Scarce condition (Fig. 3).

Study 3

Together, Studies 1 and 2 found that, for the situation of scarcity in these studies, it is stronger engagement-sustained attention rather salience-drawn attention that underlies the scarcity effect on value, and the scarcity involved in one set of objects can impact the value of a separate ‘unrelated’ object in the same setting, as suggested by RET. Study 3 considered a possible boundary condition for the scarcity effect on value. The stronger engagement in Studies 1 and 2 derived from the situation of scarcity creating an interfering force that participants needed to oppose to continue with their decision making. Opposing an interfering force is only one source of stronger engagement. Other sources include regulatory fit and using proper means while making a decision (Higgins et al. 2003, 2008).

Yet another source of stronger engagement is experiencing an object or event as real (vs. imaginary), such as being told that a future event has a high likelihood of happening (treated as real) or only a low likelihood of happening (not treated as real). Treating something as real recruits resources to deal with it, thereby strengthening engagement (Higgins et al. 2013). Participants vary in how real they experience the object choices to be. If they experience the object choices as real, then the predicted scarcity effect on value should occur. But if they do not experience the object choices as real, then the predicted scarcity effect should be reduced or even eliminated. Study 3 investigated this potential boundary condition by measuring how real participants’ experienced the decision situation.

Method

Ninety university students (64 women and 26 men) participated online. Participants were told that they would be entered into two lotteries. The first was for \$50, and we would select one winner from the entire study. The second was for a binder with the University’s logo on the front, and we would select one winner for this lottery each day the study runs. Participants then proceeded to choose which binder they would prefer. Participants were given four choices: three of them were identical red binders (abundant) and one was a black binder (solitary).

Similar to Studies 1 and 2, participants were randomly assigned to either the Scarce condition or the Replenish

condition. In the Replenish condition, the participants were told that whichever binder they chose would be replaced so that all participants would have the same choice options. In the Scarce condition, the participants were told that those were the only binders left, thus if they had won, their binder choice would not be available to future winners. We then asked participants to report how real the binders seemed to them (1 = not at all, 5 = extremely). Participants with scores from 3 to 5 were considered as experiencing the choice situation as relatively real, whereas those with scores of 1 or 2 were considered as experiencing the choice situation as relatively unreal. Finally, they were asked how much they were willing to pay if they were given the opportunity to purchase the binder. At the end of the study the participants were debriefed, thanked, and paid for their participation.

Results

We predicted that scarcity would affect payment value only when participants experienced the choice situation to be real. To analyze payment value, we used Poisson regression (a generalized linear model with a log link and a Poisson error distribution), which accounts for the non-normality and count nature of the dollar amounts offered for the binders. Among participants who found the binders to be real ($N = 56$), being in the scarce (vs. replenish) condition led to significantly greater valuation of the binders ($M = \$5.39, SD = 4.32$), almost a third more than participants in the replenish condition ($M = \$4.10, SD = 3.46; z = 2.14, p < .05$). Consistent with Studies 1 and 2, this effect did not depend on whether participants’ choice was the solitary object or the abundant object (Scarce vs. Replenish \times Solitary vs. Abundant interaction, $F < 1$). This effect also remained significant after controlling for age, gender, and binder choice ($z = 2.02, p < .05$). Among participants who found the binders to be unreal ($N = 34$), those in the scarce condition ($M = \$3.12, SD = 2.29$), if anything, offered non-significantly less than those in the abundant condition ($M = \$3.53, SD = 3.11; z < 1, p > .5$).

General discussion and conclusions

This research contributes to the scarcity–attention proposal by demonstrating that for the scarcity situation that we examined, it is stronger engagement-sustained attention rather than salience-drawn attention that underlies the scarcity effect of making positive objects more positive and negative objects more negative. In addition, the studies also demonstrate that the scarcity involved in one set of objects can impact the value of a separate ‘unrelated’ object in the

same setting, as suggested by regulatory engagement theory. Indeed, Study 2 found that the situation of scarcity can make a negative ‘unrelated’ object more negative while the positive scarce object becomes more positive. Finally, Study 3 identifies a boundary condition—people must experience the objects in the choice situation as real in order for scarcity to affect value. With the first evidence that a more general *situation of scarcity* causes intensification of the value of multiple products, our studies demonstrate the power of the scarcity–sustained attention–engagement link for understanding value and generating new research in this important field.

We interpret the findings of our studies in terms of the sustained attention involved in engagement that is strengthened by opposing the interference from the situation of scarcity, where resources are recruited to maintain attention and the motivational force experience of attraction or repulsion is intensified by this resource recruitment. There are other possible interpretations of our findings that are different from regulatory engagement theory but, nonetheless, share some understandings of what might be going on in the situation of scarcity that intensifies value. Our scarcity manipulation, for example, could be conceptualized as making the decision-making activity more difficult and, in anticipation of this difficulty, energy-motivational arousal is mobilized that intensifies evaluative responses. This model is discussed in Brehm and Self (1989), but these authors also point out that such effects should not persist *after* the activity is completed. Their model, then, would not account for the transfer effect in Study 2 where the negativity of the negative drink increases even though this activity occurs after the decision in the prior situation of scarcity is completed. It should be noted, however, that there is another version of mobilizing energy-motivational arousal where the arousal can have post-activity residual effects on value intensity akin to Zillmann’s (1978) excitation–transfer effects on value (Wright et al. 1990). This is an intriguing possibility whose difference from our regulatory engagement mechanism needs to be explored.

Brehm also has another model that, in this case, would share our interpretation of the situation of scarcity in terms of opposing an interfering force. Brehm’s (1999) theory of emotional intensity proposes that any interfering force, or deterrent, will intensify an emotion—both positive and negative—up to the point that it cannot be overcome. Our proposal that an interfering force, if opposed, strengthens engagement that intensifies evaluative responses—both positive and negative—is generally consistent with this proposal. This is not to say that Brehm’s theory of emotional intensity is the same as regulatory engagement theory. Brehm’s theory identifies other factors that contribute to emotional intensity that are not part of regulatory engagement theory and regulatory engagement theory

postulates additional sources of engagement strength other than opposing interfering forces, such as regulatory fit (see Higgins 2006), use of proper means (Higgins et al. 2008), and expressions of likelihood that make future events more real (Higgins et al. 2013). Nonetheless, there are implications of Brehm’s theory that are applicable to regulatory engagement theory as well, such as his theory highlighting an important boundary condition to intensification from opposition—that the interfering force could become too strong to be overcome (i.e., too strong to oppose), which would produce disengagement and de-intensify the evaluative responses. This boundary condition deserves more empirical attention that it has received.

We should also emphasize that while our findings help corroborate the scarcity literature’s proposal that scarcity can intensify value through increasing attention, it is noteworthy that situations of scarcity may not always increase attention in a way that strengthens engagement. It is possible that scarcity affects value through increasing attention only to the extent that the increased attention strengthens engagement. Just drawing attention from salience, for example, may not be sufficient by itself to affect value if it is not followed by sustained attention. In our studies, for instance, salience from being a solitary (vs. abundant) object did not affect value. Regulatory engagement theory suggests that strengthened engagement depends on individuals being in a situation where their action has an effect. Scarcity may strengthen engagement and intensify value only when individuals believe their action will matter—in the case of our situation of scarcity, deciding whether or not to take the *last item* knowing that it will not be replaced. This situation of scarcity is experienced by all participants in the scarcity condition regardless of whether they ultimately choose the solitary or abundant object, and its effect on strengthening engagement occurs independently from which object is more salient.

From this perspective, there could be situations that are, objectively, “scarcity” situations, such as charitable appeals about endangered species, in which scarcity would *not* produce sustained attention because engagement would be weakened by people not believing that their actions would have any significant effect. In such situations, engagement would be weakened because people feel powerless in the face of such strong natural forces, or believe that irreversible damage has already been done. A critical factor in these situations may be individual differences in strength of engagement as a function of individuals’ sense that they will be effective in making a difference by taking action (for a discussion of effectiveness, see Higgins 2012). Indeed, the value effect in such scarcity situations could also be reduced by people not experiencing the objects as being real, as when a threatened, almost extinct species has become so rare that it feels almost imaginary, like the

extinct dodo bird. In this regard, it should also be noted that expressing the low likelihood that the almost extinct species will survive—in the hope that this will make the need to help the species seem more urgent—could actually make the species seem *less* real and thus *less* valuable (see Higgins et al. 2013). These possibilities should also be examined in future research.

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References

- Bianco, A. T., Higgins, E. T., & Klem, A. (2003). How “fun/ importance” fit impacts performance: Relating implicit theories to instructions. *Personality and Social Psychology Bulletin*, *29*, 1091–1103.
- Bozzolo, A. M., & Brock, T. C. (1992). Unavailability effects on message processing: A theoretical analysis and an empirical test. *Basic and Applied Social Psychology*, *13*, 93–101.
- Brehm, J. W. (1999). The intensity of emotion. *Personality and Social Psychology Review*, *3*, 2–22.
- Brehm, J. W., & Self, E. A. (1989). The intensity of motivation. *Annual Review of Psychology*, *40*, 109–131. Palo Alto, CA: Annual Reviews Inc.
- Brehm, J. W., Wright, R. A., Solomon, S., Silka, L., & Greenberg, J. (1983). Perceived difficulty, energization, and the magnitude of goal valence. *Journal of Experimental Social Psychology*, *19*, 21–48.
- Brock, T. C. (1968). Implications of commodity theory for value change. In A. G. Greenwald, T. C. Brock, & T. M. Ostrom (Eds.), *Psychological foundations of attitudes* (pp. 243–275). New York: Academic Press.
- Brock, T. C., & Brannon, L. A. (1992). Liberalization of commodity theory. *Basic and Applied Social Psychology*, *13*, 135–144.
- Cesario, J., Grant, H., & Higgins, E. T. (2004). Regulatory fit and persuasion: Transfer from “feeling right”. *Journal of Personality and Social Psychology*, *86*, 388–404.
- Cesario, J., & Higgins, E. T. (2008). Making message recipients “feel right”: How nonverbal cues can increase persuasion. *Psychological Science*, *19*, 415–420.
- Cialdini, R. B. (1985). *Influence: Science and practice*. Glenview, IL: Scott Foresman.
- Ditto, P. H., & Jemmott, J. B. I. I. (1989). From rarity to evaluative extremity: Effects of prevalence information on evaluations of positive and negative characteristics. *Journal of Personality and Social Psychology*, *57*, 16–26.
- Folger, R. (1992). On wanting what we do not have. *Basic and Applied Social Psychology*, *12*, 123–133.
- Förster, J., Higgins, E. T., & Idson, C. L. (1998). Approach and avoidance strength as a function of regulatory focus: Revisiting the “goal looms larger” effect. *Journal of Personality and Social Psychology*, *75*, 1115–1131.
- Frieze, I., & Weiner, B. (1971). Cue utilization and attributional judgments for success and failure. *Journal of Personality*, *39*, 591–606.
- Fromkin, H. L. (1970). Effects of experimentally aroused feelings of undistinctiveness upon valuation of scarce and novel experiences. *Journal of Personality and Social Psychology*, *12*, 521–529.
- Fromkin, H. L., & Brock, T. C. (1973). Erotic materials: A commodity theory analysis of availability and desirability. *Journal of Applied Social Psychology*, *3*, 219–231.
- Higgins, E. T. (2006). Value from hedonic experience and engagement. *Psychological Review*, *113*, 439–460.
- Higgins, E. T. (2012). *Beyond pleasure and pain: How motivation works*. New York: Oxford University Press.
- Higgins, E. T., Camacho, C. J., Idson, L. C., Spiegel, S., & Scholer, A. A. (2008). How making the same decision in a “proper way” creates value. *Social Cognition*, *26*, 496–514.
- Higgins, E. T., Franks, B., Pavarini, D., Sehnert, S., & Manley, K. (2013). Expressed likelihood as motivator: Creating value through engaging what’s real. *Journal of Economic Psychology*, *38*, 4–15.
- Higgins, E. T., Idson, L. C., Freitas, A. L., Spiegel, S., & Molden, D. C. (2003). Transfer of value from fit. *Journal of Personality and Social Psychology*, *84*, 1140–1153.
- Higgins, E. T., Marguc, J., & Scholer, A. A. (2012). Value from adversity: How we deal with adversity matters. *Journal of Experimental Social Psychology*, *48*, 965–967.
- Higgins, E. T., & Scholer, A. A. (2009). Engaging the consumer: The science and art of the value creation process. *Journal of Consumer Psychology*, *19*, 100–114.
- Lee, A. Y., & Aaker, J. L. (2004). Bringing the frame into focus: The influence of regulatory fit on processing fluency and persuasion. *Journal of Personality and Social Psychology*, *86*(2), 205–218.
- Lesourne, J. (1979). Economic dynamics and individual behaviour. In L. Levy Garboua (Ed.), *Sociological economics* (pp. 29–47). London: Sage.
- Lewin, K. (1951). *Field theory in social science*. New York: Harper.
- Lynn, M. (1987). *The effects of scarcity on perceived value: Investigations of commodity theory*. Unpublished dissertation, Psychology Department, Ohio State University, Columbus.
- Lynn, M. (1991). Scarcity effects on value: A quantitative review of the commodity theory literature. *Psychology and Marketing*, *8*, 67–78.
- Petty, R. E., & Mirels, H. L. (1981). Intimacy and scarcity: Effects on interpersonal attraction for males and females. *Personality and Social Psychology Bulletin*, *7*, 493–503.
- Pratkanis, A. R., & Farquhar, P. H. (1992). A brief history of research on phantom alternatives: Evidence for seven empirical generalizations about phantoms. *Basic and Applied Social Psychology*, *13*, 103–122.
- Schoormans, J. P. L., & Robben, H. S. J. (1997). The effect of new package design on product attention, categorization, and evaluation. *Journal of Economic Psychology*, *18*, 271–287.
- Shah, J., Higgins, E. T., & Friedman, R. (1998). Performance incentives and means: How regulatory focus influences goal attainment. *Journal of Personality and Social Psychology*, *74*, 285–293.
- Shippee, G., Mowen, J., & Gregory, W. L. (1981). Scarcity of behavioral evidence for commodity theory. *Replications in Social Psychology*, *1*, 15–20.
- Smith, A. (1937). *The wealth of nations*. New York: Random House. (Original work published in 1876).
- Verhallen, T. M. M. (1982). Scarcity and consumer choice behavior. *Journal of Economic Psychology*, *2*, 299–322.
- Verhallen, T. M. M., & Robben, H. S. J. (1994). Scarcity and preference: An experiment on unavailability and product evaluation. *Journal of Economic Psychology*, *15*, 315–331.
- Woodworth, R. S. (1940). *Psychology* (4th ed.). New York: Henry Holt & Company.
- Worchel, D., Lee, J., & Adewole, A. (1975). Effects of supply and demand on ratings of object value. *Journal of Personality and Social Psychology*, *32*, 906–914.
- Wright, R. A., Weeks, J. L., Burch, D., & Hernandez, H. (1990). Effect of residual excitation upon appraisals of a potential aversive outcome. *Journal of Research in Personality*, *24*, 303–322.

- Zellinger, D. A., Fromkin, H. L., Speller, D. E., & Kohn, C. A. (1975). A commodity theory analysis of the effects of age restrictions upon pornographic materials. *Journal of Applied Psychology*, *60*, 94–99.
- Zillmann, D. (1978). Attribution and misattribution of excitatory reactions. In J. H. Harvey, W. J. Ickes, & R. F. Kidd (Eds.), *New directions in attribution research* (Vol. 2, pp. 335–368). Hillsdale, NJ: Erlbaum.