Research Dialogue

Using visualization to alter the balance between desirability and feasibility during choice

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Abstract

We extend Wyer, Hung and Jiang’s (2008) analysis of visualization to consider how it could overcome the tendency for consumers to focus much more heavily on end states and goals that products and services are intended to meet and underweight the steps consumers need to take to bring about those outcomes. We summarize related literature on consumers’ mental construal of end state desirability in relation to feasibility and apply it to rebate redemption, where there is strong evidence that consumers make suboptimal economic decisions that underweight redemption feasibility. Our data confirm benefits for visualization but only for those who have a propensity to visualize. Both visualization and equivalent thought about rebate redemption steps produce choice reversals and attitude–behavior inconsistency.

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In this issue Wyer, Hung and Jiang (2008) examine visual imagery in information processing and decision-making, often comparing it to information presented and processed verbally. Using data from Hung and Wyer (2007) they also highlight the importance of imagining the use of products rather than simply focusing on product features and benefits. Indeed, when daily events that surround product use contain the basic elements of a narrative, even verbally presented information about them may be spontaneously encoded in visual terms (Wyer, Adaval, & Colcombe, 2002). We extend their discussion to a somewhat understudied yet important aspect of consumer choice, the impact of focusing on end states and goals that products and services are intended to meet rather than the steps consumers need to take to bring about those outcomes. Visualizing and imagining product acquisition and use may redress this imbalance. To the extent choices underweight the steps necessary for goal attainment they may be suboptimal since costs will be understated (e.g., consumers may back out of plans and agreements or they may experience failure and may become discouraged) and benefits will be overstated or unrealized.

Further, if there is a temporal delay between choosing, per se, and acting on the basis of that choice, mentally refocusing on steps needed to implement either acquisition or consumption may in fact lead to choice reversals and attitude–behavior inconsistency. We will provide new evidence that this is, in fact, the case. We also examine two other propositions advanced by Wyer et al. (2008). They suggest that when people encounter information that describes a series of events or a sequence of steps, they are likely to form visual images of the sequence. If that is the case, there is unlikely to be a substantial advantage in asking people, in addition, to visualize taking these steps. However, consistent with Unnava and Burnkrant (1991), it is possible that such an advantage may exist only for individuals who are disposed to form visual images and find it easy to do. We will provide further evidence about these issues as well.

Mental construal of choices

It is clear from the studies reviewed in this by Wyer et al. (2008) that visual imagery can have a substantial effect on choice. We begin by putting this issue in a somewhat different context. Construal theory utilizes the concept of psychological distance (temporal, spatial and social) between a person and objects or events to explain a number of striking differences in judgments and actions (Liberman, Trope, & Stephan, 2007; and see Trope, Liberman, & Waksslak, 2007 and associated commentaries by Dhar & Kim, 2007; Fiedler, 2007; Liberman, Trope & Wakszlak 2007; Lynch & Zauberman, 2007 in a prior issue of this journal). Applied to product choice, more desired
yet distant product benefits likely loom larger than nearer acquisition and use behaviors. Ironically if the psychological distance between the decision-maker and temporally nearer acquisition and use is actually greater than it is for anticipated product benefits, this has important implications. The higher the level of construal (associated with greater psychological distance) the more abstract are people’s thoughts, and so important details and contextual factors involved in product acquisition and use should then be underemphasized or even ignored, probably resulting in an emphasis on desirability rather than feasibility (Liberman & Trope, 1998). This could lead consumers to underestimate purchase and ownership challenges at the point of choice including perhaps their ability to adhere to the terms of an attractive mortgage or the difficulty of remaining on a particular medical or health regime.

Research on mental simulation differentiates between outcome-oriented and process-oriented thinking and suggests that elaborating the steps needed to obtain a desired outcome may be more important to achieving it than the motivational advantages of elaborating the benefits of attaining the desired outcome itself (Pham & Taylor, 1999). Escalas and Luce (2003, 2004) have applied this reasoning to the design of more effective advertisements that form action-outcome links. These advantages are likely to be more evident when some type of planning will be helpful in overcoming obstacles and hassles, such as those involved in incorporating product use into a daily routine. This stream of research implies that there may be an important role for visual imagery in helping people move toward goal attainment.

A recent analysis combining aspects of both construal and mental simulation has been extended to consumer choice via a focus on product outcomes and benefits, on the one hand, and processes of goal attainment, on the other (Hamilton & Thompson, 2007; Thompson, Hamilton, & Petrova, 2008). In their view, abstract construals are instead associated with a focus on product use outcomes and desirability criteria, while concrete construals are associated with a focus on the process of reaching the desired state and feasibility criteria. Thus, they seem to treat psychological distance in a strictly temporal sense. As discussed above, to the extent the greater personal relevance of “further away” outcomes and benefits reduces psychological distance we should expect more detailed thought about them then about pathways to achieving those outcomes. This conceptual difference may not be critical to their empirical research. In one study some participants were asked to focus on the end benefits (the “why”) of taking an energy supplement while others focused on the process (the “how”) of using it. The latter include opening the container, taking out a tablet and drinking water to swallow it. When choosing between two energy supplements, one of which was more desirable (it contained antioxidants and vitamins) and the other having an ease of use/feasibility advantage (only one tablet per day rather than a tablet taken three times per day), those engaging in process-oriented thinking better integrated desirability and feasibility, making the alternatives closer in attractiveness and increasing choice difficulty.

The acquisition and use of a product is typically taken for granted unless something occurs to make this a relevant consideration. It is reasonable to conclude that consumers choosing among alternatives will attend primarily to the outcomes they anticipate from each, whether they be immediate and concrete benefits, feelings of pride and satisfaction, social rewards or value/goal-consistent markers of success. Dominated by an outcome focus, any mental imagery or visualization that occurs is likely to elaborate such benefits. In some cases, the effort required to use a product is salient because of consumers’ prior experiences (e.g., unhappy product assembly memories) or advertisers’ emphasis on ease of use for such things as video recording and playback devices. But these appear to be exceptions. People do not, for example, expend much mental effort thinking about removing a tablet from its protective packaging when they are deciding whether to buy an over-the-counter medicine or which one to buy. At the point of choice, then, much more cursory attention is paid toward such subsidiary considerations, and so if the steps necessary to reach the goal are considered at all during choice deliberation they are less likely to be elaborated or visualized. However, consistent with both Escalas and Luce (2003, 2004) and Thompson et al. (2008), encouraging consumers to think about how easy or difficult it will be to achieve product-relevant goals at the point of choice allows them to give more appropriate consideration to product acquisition and use feasibility (i.e., how easy it is to acquire and use the product and have it fit into daily life) as a means to goal achievement.

To summarize, previous analyses of the mental construal of choices suggest that the desirability of product benefits will dominate choice under typical conditions. Advertising contributes to this by presenting these benefits as vividly as possible, probably contributing to the ease of imagining and visualizing those desirable outcomes. There can be little doubt that visualization of pathways to product acquisition and the achievement of favorable outcomes should enhance the significance of both facilitators and inhibitors that lie along this pathway. While the former can make goal commitment stronger, we believe the latter can lead to choice reversals and attitude–behavior inconsistency. We will provide relevant evidence of this shortly.

Rebate redemption

A classic instance of consumers’ failure to take feasibility into account at the point of choice is provided by estimates of rebate redemption. Consumer advocates commonly cite reports of low redemption rates (e.g., 10% or less), and a perception exists that the majority of rebates go unredeemed (Grow, 2005; Odell, 2006; Schumer, 2006). Rebate complaints to the Better Business Bureau increased 278% from 2001 to 2005 (Odell, 2006), and state legislators have introduced numerous bills to regulate rebates. By law, terms and conditions that restrict eligibility must be disclosed prior to purchase, but details regarding specific steps required to redeem a rebate are a separate matter and typically are not disclosed at purchase.

Research has documented consumers’ tendencies to discount future effort (Soman, 1998), overestimate the time available to complete future tasks (Zauberman & Lynch, 2005), and be overconfident about the prospects of redeeming a rebate (Silk,

One approach to correcting these biases is to provide consumers with estimates of actual redemption rates at the time of purchase, with the hope that doing so will make consumers better calibrated (Lynch & Zauberman, 2006). However, Silk (2004) found that rebate buyers tend to be highly confident about their likelihood of redeeming rebates despite having conservative perceptions of redemption rates. In summary, the literature suggests anything that can be done to make the implementation of rebate redemption more salient should be beneficial for consumers, who seem to take their ability/willingness to redeem rebates for granted. We will compare two ways of focusing attention on the challenges consumers face in redeeming rebates, increasing process/feasibility thought, per se, and using visualization in conjunction with the same information.

**Rebate study**

Prescriptive statements based on the mental construal literature discussed above emphasize the importance of mentally rehearsing the steps necessary to reach a goal, process-oriented thought and formulating a plan. They do not ascribe a unique advantage to asking people to visualize taking these steps. However, building on Wyer et al. (2008), visualization may have benefits that could overcome an inherent mental construal bias in favor of choice outcomes (and at the expense of giving appropriate attention to feasibility) at the point of decision. This benefit may be fairly general (general benefit hypothesis) or it may be limited to people who have an easier time visualizing (propensity to visualize hypothesis). The purpose of this study was to examine these possibilities.

**Method**

In a computerized experiment in which time allocated to successive tasks was controlled, participants (172 undergraduates who participated in exchange for extra credit) were initially informed that the study concerned how prices influence purchase behavior and how consumers view various prices offered by retailers in the consumer electronics category.

Participants were shown two identical products on their computer screens, a SanDisk 2 GB USB flash drive, available from Retailer A and Retailer B. One retailer offered it at a fixed price of $32.99, and the other at a higher price of $34.99 but with $7 rebate, for a final cost of $27.99 if the buyer redeemed the rebate (see Exhibit 1). The retailer (A or B) associated with each flash drive option was counterbalanced. Participants were informed that both retailers were equidistant to their house and have the product in stock. There was no difference between the retailers other than price. Participants had to make a choice to purchase from one of these retailers.

After participants made their choices, attitudes toward the rebate offer were assessed using three 9-point scales (negative/positive, unfavorable/favorable, bad idea/good idea; −4/+4). Participants indicated their confidence in their attitudes using a 7-point scale. Next, the participants engaged in a rehearsal task. They were asked to either visualize or think about certain aspects of the rebate-redemption steps at one time and had approximately 20 s. The rehearsal tasks were designed to equate the salience of feasibility in general across conditions and to give the participants practice in either thinking about making a purchase in the store or visualizing these actions.

Subsequently, participants were presented with a rebate redemption form which listed five necessary steps typical of rebate redemption forms (see Exhibit 2). By design, these steps should not have been surprising to those selecting the rebate option. This presentation was intended to heighten the salience of the rebate redemption process and to lead people to focus more on feasibility and their likelihood of redeeming the rebate. This study had three conditions (block thought, split thought, visualization), which differed in the way participants considered the redemption steps.

Participants in the block thought condition thought about all of the rebate-redemption steps at one time and had approximately 30 s to do so. Those in the split thought condition thought about these steps one at a time, and were allotted 15 s to think about themselves taking each of the five steps. Lastly, participants in the visualization condition visualized themselves taking these five steps one at a time and were allotted 15 s. In each condition, participants were asked to decide whether the
steps were quick and easy or time-consuming, either as a block or immediately after each rebate step was presented (visualization and split thought condition).

All of the conditions held information content constant since each of the participants saw the five necessary steps in an ordered sequence. In the visualization condition, participants received explicit instructions to visualize the steps, whereas in both the block and the split thought conditions the participants received explicit instructions to think about the steps. However, as the previously reviewed literature suggests (Wyer et al., 2002), even those explicitly instructed to think about the steps may have visualized them, but only as it might occur naturally. By varying the opportunity to visualize rebate redemption steps in the two thought conditions (i.e., as a block for 30 s or, as in the explicit visualization condition, for 15 s each) we could determine whether explicit visualization conferred advantages over a general tendency to employ visual imagery. After each step in the split thought and visualization conditions, or after all of the steps in the block exposure condition, participants were asked whether the individual or multiple steps seemed quick and easy or time-consuming.

After the manipulation, participants were informed that since most students have not had much experience with rebates they had a few extra minutes to think about their prior decision and were told that they would subsequently have the opportunity to revisit their decision and either make the same decision they made earlier or make a different decision. Next, they saw the same two flash drive options again but were not asked to make a decision between them at that time. They responded to a confidence measure, telling us how confident they were that they would redeem the rebate if they chose the rebate offer. They also responded to the same measures of attitude and attitude confidence as before. They then provided purchase likelihoods and intentions of purchasing the rebate-associated flash drive via 7-point scales and then made a final selection among the two flash drive retailers. This allows us to examine both attitudes and intentions of purchasing the rebate-associated flash drive via confidence as before. They then provided purchase likelihoods and intentions of purchasing the rebate-associated flash drive via confidence as before. They then provided purchase likelihoods and intentions of purchasing the rebate-associated flash drive via confidence as before.

Lastly, participants were asked about ease of imagining themselves (via thinking/visualizing) performing all of the necessary tasks to redeem the rebate. This allowed us to separate those who have a natural propensity to visualize (Petrova & Cialdini, 2005; Unnava & Burnkrant, 1991) and examine the those who have a natural propensity to visualize (Petrova & Cialdini, 2005; Unnava & Burnkrant, 1991) and examine the

Results and discussion

Initial choice

Since the rebate offered a $7 price advantage, we anticipated that the majority of participants would initially choose the rebate option. This was the case, with 75.4% choosing the rebate in the block thinking condition, 72.4% in the split thinking condition, and 71.9% in the visualization condition. Tests of independent proportions found that differences between conditions were not significant ($p > .30$). Since the purpose of the study was to assess how visualization versus thinking influences considerations of the feasibility of the redemption process, participants who did not choose the rebate were excluded from further analysis. The remaining sample consisted of 126 participants with balanced cell sizes of 41–43 participants per condition.

Initial attitudes

The three attitude measures exhibited high reliability (Cronbach’s $\alpha = .907$) and were combined to create a single attitude measure. As expected, attitudes obtained immediately after the initial choice task did not differ significantly across conditions ($M_{\text{block thought}} = 2.55$, $M_{\text{split thought}} = 2.35$, $M_{\text{visualize}} = 2.52$, $F(2, 120) = 0.282$, $p > .70$). Positive attitudes confirmed the attractiveness of the rebate option, and since they were measured immediately following choice, reflected whatever desirability/feasibility tradeoffs people were inclined to make without drawing attention to the actions required to redeem the rebate.

Effects of thinking vs. visualization

The next stage of the analysis examined the influence of the thinking/visualization manipulation on attitudes and behavior. Recall that all participants were presented with identical information about the steps required to redeem the rebate. Participants in the block thought condition thought about the five rebate-redemption steps at one time for 30 s. Those in the split thought condition thought about the five steps one at a time for 15 s each. Participants in the visualization condition visualized the five steps one at a time for 15 s each. We computed a measure of attitude change for each participant by taking the difference between the attitude obtained immediately after participants’ initial choice and the attitude obtained immediately after considering the feasibility of the redemption process. Negative values indicate a negative change in attitudes.

Results failed to support the hypothesis that visualization provides a general benefit to participants. Although increased attention to feasibility had the expected negative effect on attitudes toward the rebate, the degree of attitude change did not differ significantly across the three conditions ($M_{\text{block thought}} = -0.47$, $M_{\text{split thought}} = -0.56$, $M_{\text{visualize}} = -0.80$, $F(2, 120) = 0.60$, $p > .50$). Failure to detect an effect was not limited to attitude change. Null effects were also observed for confidence in redeeming the rebate ($F(2, 120) = 1.23$, $p > .30$), purchase likelihood ($F(2, 120) = 1.58$, $p > .20$), and purchase intentions ($F(1, 120) = 0.83$, $p > .40$). To examine change in choice, we computed the proportion of participants initially choosing the rebate who subsequently chose the non-rebate option after considering the feasibility of the redemption process. Results
showed 16.3% (7/43) chose the non-rebate option in the block thinking condition, 19.0% (8/42) in the split thinking condition, and 24.4% (10/41) in the visualization condition. While there was modest directional support for a general benefit of visualization, tests of independent proportions found that none of the differences between conditions were significant ($p > .10$).

**Propensity to visualize**

We next focus attention on the hypothesis that the benefits of visualization may be limited to those with a higher propensity to do so (Petrova & Cialdini, 2005; Unnava & Burnkrant, 1991). We consequently performed a median split on the measures administered at the end of the study which asked about the ease of imagining oneself (via thinking/visualizing) performing the tasks necessary to redeem the rebate. We then replicated the analysis reported earlier with participants in the three conditions who scored above the median.

Results support the hypothesis that the benefits of visualization are limited to those who have a natural propensity to visualize. The degree of attitude change after considering the feasibility of the redemption process differed significantly across the three conditions ($F(2, 57) = 7.19, p < .01$). Planned contrasts revealed that the negative impact on attitudes was significantly greater in the visualization condition ($M = −.86$) compared to the block thinking condition ($M = .15, p < .01$), and the split thinking condition ($M = −.14, p < .01$). The difference between the block thinking condition ($M = .15$) and the split thinking condition ($M = −.14$) was not significant, $p > .10$. This casts some doubt on a general (i.e., unprompted) tendency to engage in mental imagery even when conditions are quite favorable for doing so (in the split thinking condition), and even for people who report greater facility imagining themselves performing these actions.

Similar patterns were observed for confidence in redeeming the rebate ($F(2, 57) = 4.14, p < .05$), purchase likelihood ($F(2, 57) = 3.89, p < .05$), and purchase intentions ($F(2, 57) = 3.65, p < .05$). An analysis of attitude confidence found that confidence did not differ significantly across conditions ($F(2, 57) = 1.62, p > .20$) and was not significantly lower than the confidence expressed in participant’s initial attitudes ($F(2, 57) = 1.42, p > .20$). This ruled out the possibility that the observed effects are an artifact of differences in attitude confidence. Finally, with regard to changes in choice, a significantly higher proportion of participants in the visualization condition altered their choice to take the non-rebate option (45.0%) compared to those in the block thinking condition (14.3%, $z = 2.42, p < .01$) and the split thinking condition (19.0%, $z = 1.82, p < .05$). Again, the difference between the block and split thinking conditions was not significant ($z = 0.41, p > .30$), indicating an absence of unprompted visualization even when redemption steps were presented sequentially. In sum, the results provide strong evidence that the benefits of visualization are limited to those who have a propensity to imagine themselves performing these actions, and only when visualization is explicitly encouraged.

**Attitude–behavior consistency**

As discussed earlier, previous analyses of the mental construal of choices suggest that the desirability of benefits dominates choice under typical conditions. Thompson et al. (2008) suggest that attitudes will be less consistent with behavior once people have thought about the process (i.e., feasibility) of goal attainment since those engaged in process-oriented thinking better integrate desirability and feasibility, making alternatives closer in attractiveness and increasing choice difficulty. The visualization of pathways to favorable outcomes should enhance the significance of both facilitators and inhibitors that lie along this pathway. While the former can make goal commitment stronger, the latter can lead to attitude–behavior inconsistency. The analysis that follows provides direct evidence that failing to adequately consider feasibility can decrease attitude–behavior consistency.

We performed an analysis comparing the ability of initial attitudes to predict rebate choice with attitudes measured following explicit consideration of the steps required to redeem the rebate. Attitudes obtained after considering the feasibility of the rebate process were found to be significantly correlated with choice in each of the three conditions (block thought $r = .66, p < .01$; split thought $r = .80, p < .01$; visualization $r = .79, p < .01$). These results are not surprising given that participants in all three conditions were exposed to detailed feasibility information which they could then integrate into earlier-formed attitudes toward the desirability of the rebate. In contrast, the correlation between initial attitudes and choice was weak and non-significant, with the exception of the block thought condition where it was significant (block thought $r = .42, p < .01$; split thought $r = .31, p > .10$; visualization $r = .10, p > .10$). The significant correlation in the block thought condition is likely attributable to the fact that few participants altered their final choice away from the rebate option when they considered the rebate steps in a block, almost certainly resulting in less explicit attention to these steps. In comparison, the correlation between initial attitudes and choice was weakest in the visualization condition, suggesting that visualization of these steps increased the weight given to previously under-emphasized feasibility issues. These results provide direct evidence that failing to adequately consider feasibility can decrease attitude–behavior consistency and cause choice reversals, both of which may be appropriate recalibrations and lead to improved outcomes.

**Summary and conclusion**

Our results lend support to a number of previously advanced propositions concerning the benefits of visualization and have some meaningful practical and policy implications. First, they demonstrate that feasibility issues are less likely to be elaborated upon relative to desirability at the point of choice. Our study may provide a more stringent examination of that issue than most because the choice to purchase an item associated with a rebate should bring to mind inherent feasibility aspects. People understand that they will not be making a sound economic
decision unless it is feasible for them to take the steps required to redeem the rebate. Even in that context, our results suggest that feasibility may take a backseat to more salient decision outcomes (e.g., cost saving). These results are consistent with previously summarized “real world” evidence that a very high proportion of consumers actually fail to follow through and redeem rebates. Consumers appear to be poorly calibrated about this propensity, leading to economically wasteful decisions (relative to the higher initial cost savings they could have chosen). Our findings extend more generally to choice domains where it may not be prudent for individuals to make decisions without explicit attention to the feasibility of goal attainment (e.g., remaining on medical or health regimes, making higher mortgage payments required by adjustable loans).

Although we found a modest directional benefit from explicit instructions to visualize, those benefits primarily accrue to those who have an easier time visualizing themselves performing tasks. The visualization gain for those people runs somewhat counter to the notion advanced in this issue by Wyer et al. (2008) who suggest that when people encounter verbal information that describes a series of events or a sequence of steps, they are likely to form visual images of the sequence. If that were the case we should not observe a significant benefit for imagery prompting and rehearsal and primarily for easy visualizers, particularly when compared to the split thought condition. In the best of circumstances, visualizing is not likely to be a panacea, as consumers’ mental construal is likely biased by people’s discounting of future effort and associated time (Zauberman & Lynch, 2005).

Finally, consistent with Thompson et al. (2008), we found both choice reversals and changes in attitude—behavior consistency following increased attention to the feasibility of an action. This should not be surprising since attitudes cannot be expected to predict behavior (however well they are measured) when attitude formation relies on somewhat different information (e.g., here more heavily weighted desirability information) than does a subsequent choice (e.g., here, after making feasibility more salient). Cohen and Reed (2004) discuss how such retrieved attitudes are likely to be modified to guide behavior when additional emphasis is given to contextual factors. Given a natural tendency to focus on desirability when choosing between options, attitudes toward each alternative are likely to reflect that bias. Consistent with Cohen and Reed (2004), this research suggests that greater attention be given to factors (such as feasibility) that systematically affect people’s reliance on such attitudes and on the intervening attitude adjustment process, per se.

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