

Research Article

The ‘‘Instrumentality’’ Heuristic

Why Metacognitive Difficulty Is Desirable During Goal Pursuit

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ABSTRACT—*The literature overwhelmingly demonstrates that feelings of ease are good and that objects that are easy to process are much liked. We propose, and demonstrate across three experiments, that this is not the case when people are pursuing a goal. This is because people pursuing a goal (e.g., “become kinder”) usually invest efforts in whichever means (e.g., donate to a particular charity) they perceive as most instrumental for attaining their goal. Consequently, in their minds there is a correspondence between instrumentality of a means and feelings of effort. This correspondence becomes reversed in people’s minds during goal pursuit, and they also come to view an object that is associated with feelings of effort rather than ease as more instrumental for goal attainment and consequently more desirable. When an object is not a means to fulfill an accessible goal, or when goals relating to the means are not accessible, subjective feelings of ease improve evaluation, as found in previous research on ease of processing.*

Nothing in the world is worth having or worth doing unless it means effort, pain, difficulty.

—Theodore Roosevelt (*Quotes, Sayings, and Aphorisms by Theodore Roosevelt*, 2008)

Ample research has established that feelings serve as information about preferences (Schwarz, 2004), and one important source of feelings is the subjective characteristics of a stimulus itself (e.g., clarity). Existing research shows that if the characteristics of a stimulus are easy to process, feelings of ease arise during processing of that stimulus. These feelings are beneficial and increase liking of the stimulus (Berlyne, 1966; Bornstein, 1989; Schwarz, 2004; Zajonc, 1968, 1980). For example, ab-

stract images, line drawings, and pictures are evaluated more favorably when their visual characteristics are clear, rather than blurry (Reber, Winkielman, & Schwarz, 1998), an effect that is independent of the descriptive characteristics (attributes) of the stimuli. Similarly, previously encountered faces, music, words, and advertisements are more likeable than those not previously encountered, presumably because they are easier to process (Bornstein, 1989; Lee & Labroo, 2004; Mandler, Nakamura, & Van Zandt, 1987; Winkielman & Cacioppo, 2001).

It has been proposed that because personally relevant and familiar objects usually come to mind quickly and are processed easily, people implicitly associate familiarity and personal relevance with feelings of ease (Schwarz, 2004). Thus, in people’s minds, there is a correspondence among familiarity, personal relevance, and subjective feelings of ease. But people also sometimes make a reverse inference. That is, when information pertaining to a stimulus is associated with subjective ease of processing (e.g., when the text and image being evaluated are clear, rather than blurry), those feelings of ease are attributed to the target object, which in turn is evaluated as more familiar, self-relevant, and consequently desirable than a stimuli associated with greater difficulty of processing (Schwarz, 2004).

In summary, subjective ease is seen as good, and things that feel easy are liked. However, it is also the case that achieving something of value usually requires effort and occurs with difficulty. In this article, we argue that among people pursuing a goal (e.g., to “become a kinder person”), subjective difficulty, rather than ease, of processing information will improve evaluation of a target object that is a means to attain the goal (e.g., the Kids In Danger charity). This is because during goal pursuit, one must assess how instrumental a target object is for satisfying the activated goal. That is, when trying to reach a goal, people must ask themselves, “Is this object any good for accomplishing my goal?” We argue that in this situation, an “instrumentality heuristic,” or the naive belief that effort signals instrumentality, becomes pertinent.

We propose that an instrumentality heuristic arises because people trying to reach an important goal can choose among many

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means to accomplish their goal but usually invest effort in those means that are perceived as most useful for reaching their goal. Thus, during goal pursuit, effort is associated with value, usefulness, and instrumentality of a means. But people reverse this correlation between effort and instrumentality of a means in their minds. That is, during goal pursuit, they perceive effort as a signal of usefulness of a target means in fulfilling their goal.

Consequently, among people trying to reach a goal and assessing the instrumentality of a target object in satisfying that goal, feelings of subjective difficulty will improve evaluation of the target. This is because effort arising from metacognitive difficulty will be attributed to instrumentality of the means, which in turn will increase liking of the target. When clear goals are not accessible, or when the target object is not a means to fulfill an accessible goal, ease of processing will improve evaluation, as in previous research (Schwarz, 2004). Thus, the effect of metacognitive ease or difficulty on the evaluation of a target object will depend on whether or not metacognitive difficulty serves as information to the motivational system regarding usefulness and effectiveness of the target object in fulfilling an accessible goal.

In three experiments, we tested the prediction that metacognitive difficulty, rather than ease, improves evaluation of a target product when participants have a highly accessible goal because the product is viewed as more instrumental in accomplishing that goal. In all three experiments, we manipulated difficulty of processing by giving participants either blurry and low-contrast (i.e., difficult-to-process) or clear and high-contrast (i.e., easy-to-process) materials, employing established methodology from previous experiments (Novemsky, Dhar, Schwarz, & Simonson, 2007). Experiment 1 examined whether a highly accessible feel-good goal would lead participants to like LeVour chocolate more when information regarding the chocolate was subjectively difficult, rather than easy, to process. Experiment 2 investigated whether this effect applies beyond products that deliver immediate pleasure. We used a real donation measure to determine whether people who had been primed with a goal to be a kinder person would donate more money to a charity when the materials were difficult, rather than easy, to process. Finally, Experiment 3 used a chronic measure of goal accessibility to replicate this effect. It also tested whether instrumentality of the target object as a means to fulfilling the accessible goal underlies the effect, and whether the effect is attenuated when people are unable to misattribute effort to effectiveness of the target in fulfilling the accessible goal.

EXPERIMENT 1

Method

Seventy-four undergraduate students (62.2% women, 37.8% men) participated for monetary compensation. We used a 3 (goal priming: feel-good vs. goal-unrelated vs. self-control priming) \times 2 (processing: easy vs. difficult) between-subjects design. Par-

ticipants were randomly assigned to one of the three goal-priming conditions. After completing the priming task, they indicated how much they were willing to pay for a box of designer chocolate. Information pertaining to the chocolate was presented in either an easy- or a difficult-to-read ad. In a pretest, the difficult-to-process ad was judged as more difficult to read than the easy-to-read ad, but no differences in understanding of the content emerged, and memory for content was similar across the two conditions. We predicted that participants primed with feel-good goals, unlike those primed with self-control goals or goal-unrelated thoughts, would be willing to pay more for the chocolate when the ad was difficult rather than easy to process.

The goal-priming manipulation was a scrambled-sentence test, which we adapted from existing research (Fishbach & Labroo, 2007). Participants saw six sets of five words and in each case were asked to form a grammatically correct sentence by using four of the words. Depending on priming condition, the statements that could be formed pertained to a feel-good goal (e.g., “aim for most pleasure”); pertained to a self-control goal, which conflicted with the temptation presented by the chocolate (e.g., “fitness is a virtue”); or were unrelated to a goal (e.g., “the ball is blue”). After completing this task, participants evaluated it on a scale from 1 (*bad, negative, depressing*) to 7 (*good, positive, uplifting*; $\alpha = .76$).

Next, in a presumably unrelated marketing study, participants read either a blurry (difficult-to-process) or a clear (easy-to-process) ad for LeVour chocolate (see Fig. 1). After reading the ad, participants indicated how much they were willing to pay for the 10-piece collection, how much they wanted LeVour chocolate (1 = *not at all*, 7 = *very much*), how desirable it was (1 = *not at all*, 7 = *very much*), and how tempting it was (1 = *not at all*, 7 = *very much*). We also asked participants to rate their attention to the ad (1 = *paid little attention*, 7 = *paid a lot of attention*), how completely they had read the materials (1 = *skipped some words*, 7 = *read all the words*), their mood (1 = *felt bad*, 7 = *felt good*), and how arousing the materials were (1 = *not arousing*, 7 = *very arousing*). They reported how much they liked chocolate in general (1 = *not at all*, 7 = *very much*) and how scarce (limited in availability) LeVour chocolate seemed (1 = *not at all*, 7 = *very much*); these data allowed us to ensure that any between-condition differences in the evaluations of the chocolate were not due to chocolate being generally more desirable or LeVour chocolate being perceived as more scarce, and thus as more valuable, in one condition than the others. Participants were then debriefed.

Results

As we expected, the evaluation of the priming task itself did not differ across the three goal conditions, nor did the conditions differ on measures pertaining to attention, completeness in reading the materials, mood, arousal, or general attitude toward chocolate, all F s < 1. In addition, the perceived scarcity of

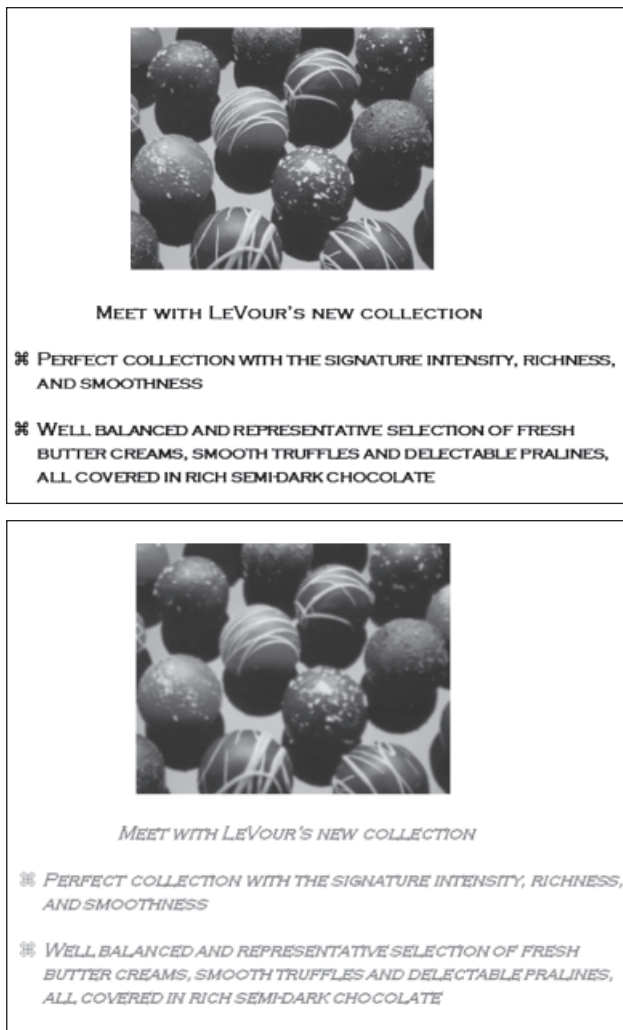


Fig. 1. Sample advertisements used in Experiments 1 and 3. The ad at the top is easier to process than the ad at the bottom because the photo and type are clearer.

LeVour chocolate did not differ significantly across the three goal conditions. Thus, if our main analysis were to indicate that difficulty of processing made the target more tempting, it is unlikely that this would be because difficulty somehow made the target appear less abundant or more restricted.

A 3 (goal priming) \times 2 (processing) analysis of variance (ANOVA) on the averaged evaluation of LeVour chocolate (ratings of wanting and desiring the chocolate and of how tempting it was; $\alpha = .91$) revealed only a significant interaction, $F(2, 68) = 10.95, p_{\text{rep}} > .94, \eta^2 = .24$ (other F s < 1). As we predicted, and in contrast to the findings of previous research on ease-of-processing effects, participants primed with a feel-good goal evaluated LeVour chocolate more favorably when the ad was difficult to process than when it was easy to process (M s = 5.81 vs. 3.91), $F(1, 21) = 21.08, p_{\text{rep}} > .99, \eta^2 = .50$. However, also as we predicted, and in line with the findings of previous research on ease-of-processing effects, participants primed with a self-control goal, which conflicted with the temptation presented by

the chocolate, preferred LeVour chocolate when the ad was easy rather than difficult to process (M s = 5.21 vs. 3.91), $F(1, 23) = 5.28, p_{\text{rep}} < .94, \eta^2 = .19$, as did participants primed with goal-unrelated thoughts (M s = 4.71 vs. 4.36), $F(1, 25) < 1, \eta^2 = .02$, though the latter effect was not significant.

The willingness-to-pay data were positively skewed and were therefore log-transformed. A 3 (goal priming) \times 2 (processing) ANOVA on this transformed index revealed a significant interaction, $F(2, 68) = 5.46, p_{\text{rep}} > .94, \eta^2 = .14$ (see Fig. 2). As we predicted, participants primed with a feel-good goal were willing to pay more for LeVour chocolate when the ad was difficult to process than when it was easy to process (M s = \$8.46 vs. \$5.00), $F(1, 21) = 6.84, p_{\text{rep}} > .96, \eta^2 = .25$. However, participants primed with a conflicting self-control goal were willing to pay more for LeVour chocolate when the ad was easy, rather than difficult, to process (M s = \$6.19 vs. \$3.49), $F(1, 22) = 3.89, p_{\text{rep}} > .91, \eta^2 = .15$, as were participants primed with goal-unrelated thoughts (M s = \$9.00 vs. \$5.46), $F(1, 25) = 1.32, p_{\text{rep}} > .80, \eta^2 = .05$, though the latter effect was not significant.

In summary, these data show that when an object is a means to an accessible goal, processing difficulty improves its evaluation. When the object is not a means to fulfill an accessible goal, or when goal-unrelated thoughts are primed, results similar to those obtained in other ease-of-processing studies are obtained. It is possible that some participants in the goal-unrelated-thoughts condition had chronic feel-good goals and that this condition was not truly goal unrelated; this may be why the effect of processing ease on evaluation of and willingness to pay for the chocolate only approached significance. That is, if some participants had chronic feel-good goals whereas the remainder had self-control goals, our effects on evaluation of the chocolate might have averaged out across the two groups and become attenuated. Therefore, in Experiment 2, we used the goal “be a kinder person,” which a pretest showed is less chronic than the goal of feeling good; undergraduate students were significantly more likely to spontaneously list “academic achievement” or

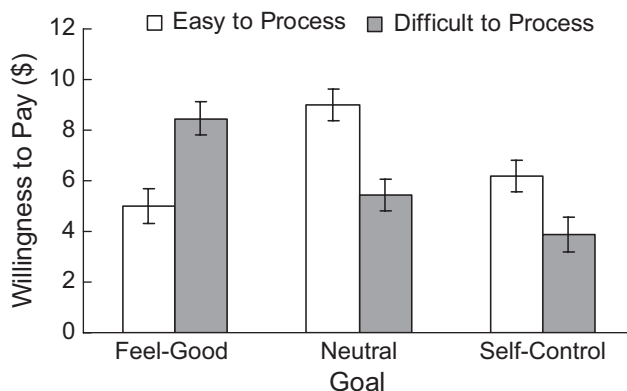


Fig. 2. Mean amount participants in Experiment 1 were willing to pay (in U.S. dollars) for a 10-piece collection of LeVour chocolates as a function of goal priming and processing difficulty. Error bars represent standard errors.

“feel good,” rather than “be kind,” as a top goal. In addition, to ensure that our results apply beyond hedonic products, we employed donation to charity as the dependent variable in Experiment 2. We used charity materials that were rated as unpleasant and negative in pretesting so we could be sure that neither they nor the donation to the charity provided immediate pleasure. We did this because previous studies have suggested that effort is a justification for reducing guilt when choosing hedonic products (Kivetz & Simonson, 2002), and it is possible that subjective difficulty plays a similar role. That is, people feel justified to indulge with hedonic products, and feel less guilty doing so, after they have put in effort, but in the case of donation to a charity, there is no reason to feel guilty and no need to justify one’s actions.

EXPERIMENT 2

Method

Sixty-two undergraduate students (50% women, 50% men) participated for compensation. The study followed a 2 (accessibility of the be-kind goal: high vs. low) \times 2 (processing: easy vs. difficult) between-subjects design, and money donated to charity was the dependent variable. All participants completed a scrambled-sentence task similar to that of Experiment 1; depending on goal-accessibility condition, the task primed either the goal to become a kinder person or goal-unrelated statements.

Participants were then told that the experiment was over and were compensated. At this time, they were asked if they would be willing to participate in another, short study, supposedly for another experimenter. All participants agreed to do so. In that study, participants were asked to look at materials about Kids In Danger, an organization (<http://www.kidsindanger.org>) that publicizes defective children’s products. The materials were either easy or difficult to process (see Fig. 3). Participants evaluated their attention to the materials (1 = *paid little attention*, 7 = *paid a lot of attention*), how completely they read the materials (1 = *skipped some words*, 7 = *read all the words*), how the information made them feel (1 = *makes me feel bad*, 7 = *makes me feel good*), and how arousing the materials were (1 = *not at all arousing*, 7 = *arousing*). They were also provided with an opportunity to donate anonymously to the charity if they wanted to do so. The survey included an envelope for money and was deposited in a pile of completed surveys. No participant guessed the true purpose of our study.

Results

A 2 (goal accessibility) \times 2 (processing) ANOVA on the amount donated revealed only a significant interaction, $F(1, 58) = 8.97$, $p_{\text{rep}} > .98$, $\eta^2 = .13$ (see Fig. 4). As we expected, participants primed with the goal to become a kinder person donated more money when they were given difficult-to-process materials than

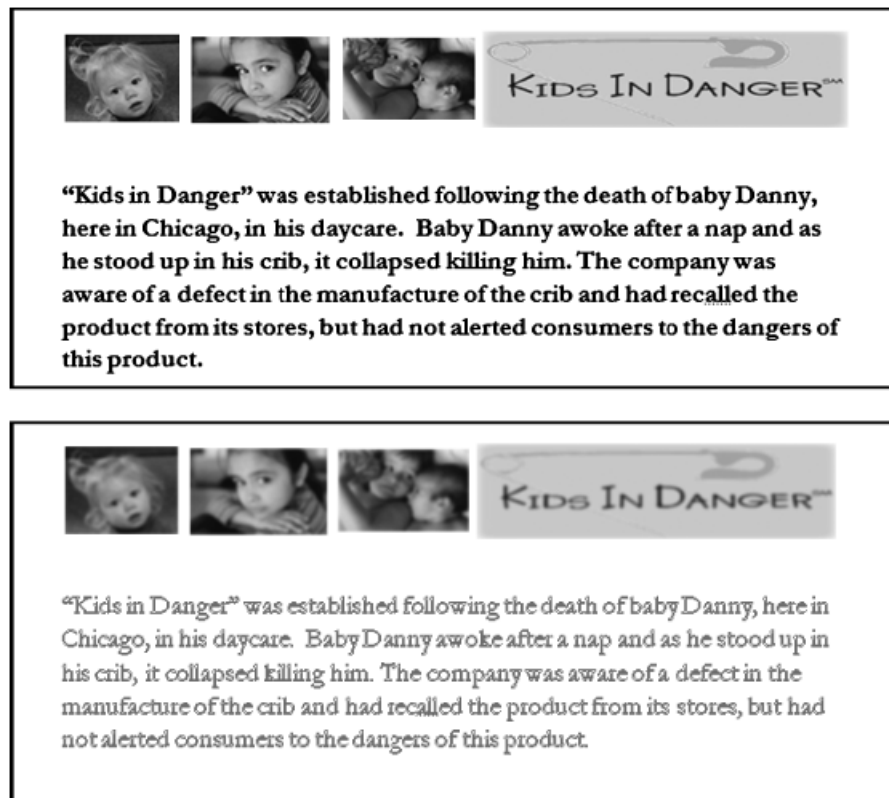


Fig. 3. Sample materials used in Experiment 2. The material at the top is easier to process than the material at the bottom because the photo and type are clearer.

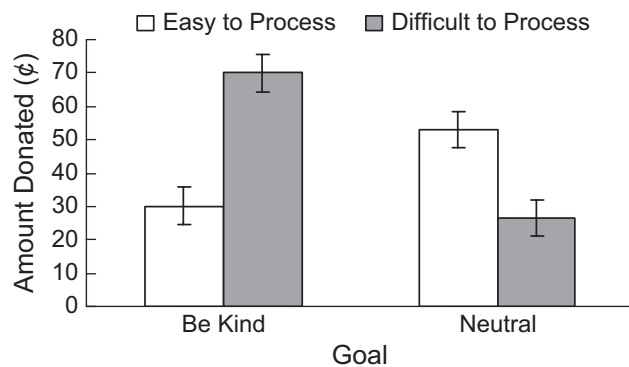


Fig. 4. Mean amount that participants in Experiment 2 donated to Kids In Danger (in cents) as a function of goal and processing difficulty. Error bars represent standard errors.

when they were given easy-to-process materials ($M_s = \$0.70$ vs. $\$0.30$), $F(1, 28) = 5.55$, $p_{\text{rep}} = .95$, $\eta^2 = .17$. In contrast, participants in the goal-unrelated priming condition donated more money when the materials were easy rather than difficult to process, a result replicating research on ease of processing ($M_s = \$0.53$ vs. $\$0.26$), $F(1, 30) = 3.36$, $p_{\text{rep}} > .90$, $\eta^2 = .10$. As in Experiment 1, attention, mood, arousal, and completeness in reading did not differ across conditions. Thus, this experiment replicated and extended Experiment 1 by employing a real behavioral measure, in a domain that is not hedonic. Although the consumption of hedonic products is often justified by effort (e.g., “If I exerted effort, I deserve to indulge”), it is unlikely that effort is a justification for increased donation. The purpose of Experiment 3 was to investigate more directly whether target objects that are a means to fulfill an accessible goal are considered more instrumental in fulfilling that goal when they are associated with metacognitive difficulty, rather than ease.

EXPERIMENT 3

Experiment 3 extended the findings of Experiments 1 and 2 in three important ways. First, we employed a chronic (individual difference) measure of the feel-good goal, rather than situation-activated goals. Second, we included an additional processing condition in which participants evaluated materials that were subjectively difficult to process and difficulty was correctly attributed to the font used. We expected that participants’ awareness of the true source of the difficulty would attenuate the observed effects of difficulty on evaluation because participants would no longer misattribute difficulty to instrumentality of the target object in fulfilling their goal. Third, we collected a measure of instrumentality of the means in fulfilling the goal to implicate the underlying process. We followed a 2 (feel-good goal: high vs. low) \times 3 (processing: easy vs. difficult vs. difficult with source attribution) between-subjects design, and evaluation of LeVour chocolate served as the dependent variable.

Method

On a four-item scale, 85 undergraduate students (51.8% women, 48.2% men) indicated the extent to which they endorsed the feel-good goal (1 = *having discipline is important*, 7 = *feeling happy is important*). Next, participants read either a clear or a blurry ad for LeVour chocolate, as in Experiment 1, or they read a blurry ad for LeVour chocolate but, before the task, were informed that the ad might be difficult to read because of the font (method adapted from Novemsky et al., 2007). All participants then indicated their attitude toward LeVour chocolate (desirability: 1 = *undesirable*, 7 = *desirable*; favorability: 1 = *unfavorable*, 7 = *favorable*; liking: 1 = *dislike*, 7 = *like*; positivity: 1 = *negative*, 7 = *positive*; $\alpha = .92$), their attitude toward the ad (as in Experiment 1, they rated their attention to the ad, how completely they had read the materials, their mood, and how arousing the ad was), and how instrumental LeVour chocolate is in fulfilling a feel-good goal (“Eating LeVour is important to feel better”: 1 = *disagree*, 7 = *agree*; “Eating LeVour chocolate will make me feel good”: 1 = *disagree*, 7 = *agree*). Participants also rated the importance of the feel-good goal (“Feeling good is more important than self-control”; 1 = *disagree*, 7 = *agree*), the scarcity of LeVour chocolate (“LeVour’s chocolate would be hard to find in stores”; 1 = *disagree*, 7 = *agree*), and their agreement with the instrumentality heuristic and with the idea that they put the most effort into attaining what is most desirable (“I put effort to fulfill meaningful goals” and “What is important needs effort”: 1 = *disagree*, 7 = *agree*).

Results

We averaged responses to the four items on the feel-good scale ($\alpha = .85$) to form an index and then used a median split to divide the participants into two groups: high feel-good goal and low feel-good goal. There were no observable differences across conditions in attitude toward the ad. Perceived scarcity of LeVour also did not differ across conditions, so differences in evaluation of the chocolate across conditions cannot be attributed to people simply valuing what feels scarce. Difficulty of processing did not affect rated importance of the feel-good goal, and regardless of condition, participants endorsed the notion that they put the most effort into attaining what is most desirable ($M = 5.74$). Thus, it is unlikely that differences in wanting LeVour chocolate can be attributed to these last two factors, all $F_s < 1$.

A 2 (goal) \times 3 (processing) ANOVA on evaluation of LeVour chocolate revealed only the expected interaction, $F(2, 79) = 5.73$, $p_{\text{rep}} > .95$, $\eta^2 = .13$ (see Fig. 5a). As we predicted, participants with high feel-good goals had more favorable attitudes toward the chocolate when they saw the difficult-to-process ad than when they saw the easy-to-process ad ($M_s = 5.20$ vs. 4.33), $F(1, 24) = 7.13$, $p_{\text{rep}} = .97$, $\eta^2 = .23$; when participants correctly attributed processing difficulty to the font, they corrected for the effect of processing difficulty by adjusting their evalua-

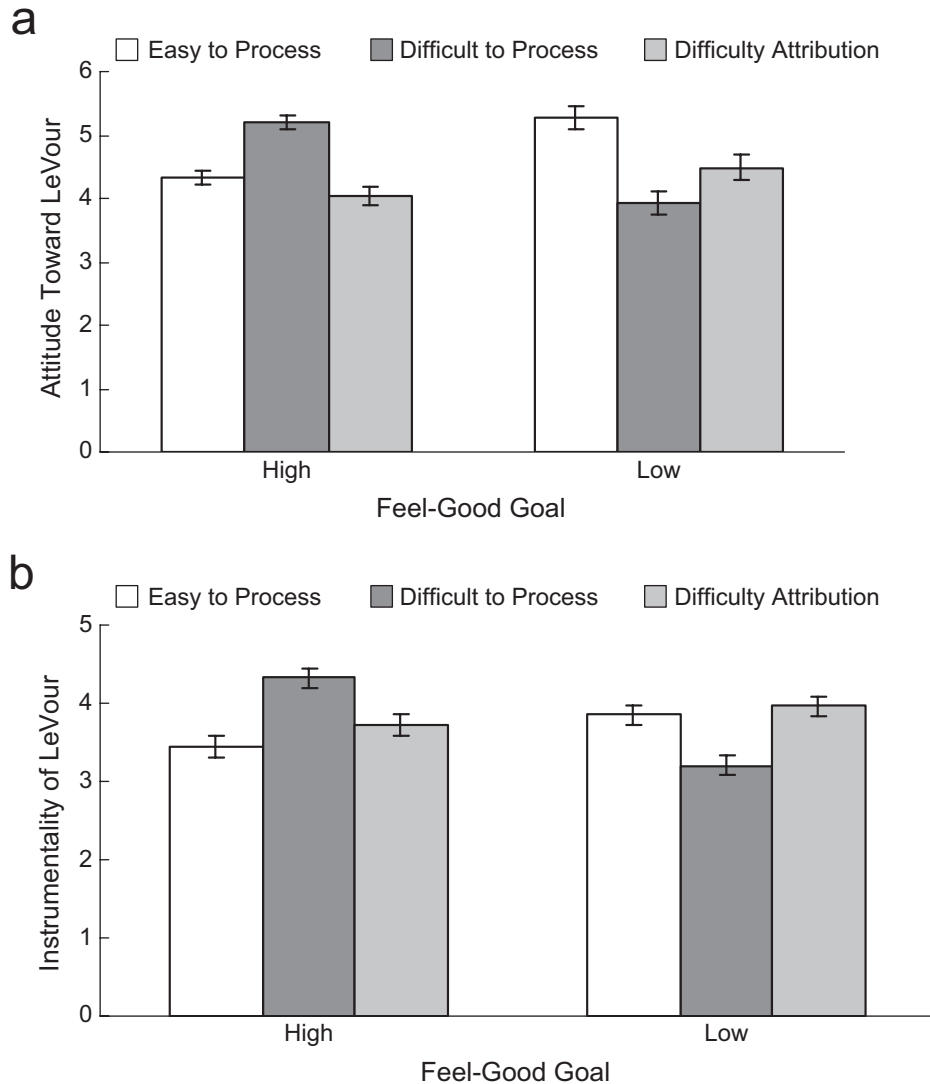


Fig. 5. Results from Experiment 3: (a) attitude toward LeVour chocolate and (b) perceived instrumentality of LeVour chocolate in fulfilling mood goals as a function of chronic accessibility of the feel-good goal and processing difficulty. Error bars represent standard errors.

tion downward ($M = 4.04$), so that it differed from that of participants who saw the difficult-to-read ad without explanation, $F(1, 25) = 8.22, p_{\text{rep}} > .97, \eta^2 = .25$, and was similar to the evaluation of participants who saw the easy-to-process ad, $F < 1$. In contrast, participants with low feel-good goals had more favorable attitudes when they saw a clear ad than when they saw a blurry ad ($M_s = 5.26$ vs. 3.93), $F(1, 30) = 5.95, p_{\text{rep}} > .95, \eta^2 = .17$, and when participants who saw the difficult-to-read ad were made aware of the source of the processing difficulty, they corrected their evaluation upward ($M = 4.34$), so that it was no different from that of participants who saw the easy-to-process ad, $F(1, 27) < 1, \eta^2 = .02$. In summary, subjective difficulty of processing improved evaluations of LeVour chocolate among participants with high feel-good goals, but only if they were unable to correctly attribute difficulty of processing to the font. In addition, and in line with the results of previous research on

ease of processing, subjective difficulty of processing reduced evaluations of LeVour chocolate among participants with low feel-good goals, but only if they were unable to correctly attribute processing difficulty to the font.

Instrumentality of Means

A 2 (goal) \times 3 (processing) ANOVA on averaged ratings of instrumentality of LeVour chocolate in addressing feel-good goals revealed only the expected interaction, $F(2, 79) = 4.83, p_{\text{rep}} = .94, \eta^2 = .11$ (see Fig. 5b). Participants with high feel-good goals indicated that LeVour chocolate was more instrumental in making them happy when they read an ad that was difficult to process than when they read an ad that was easy to process ($M_s = 4.32$ vs. 3.45), $F(1, 24) = 5.63, p_{\text{rep}} > .95, \eta^2 = .19$, and attributing processing difficulty to the font reduced the judged instrumentality of LeVour chocolate ($M = 3.73$), so that it was at

the same level as in the easy-processing condition, $F(1, 23) < 1$, $\eta^2 = .02$. In addition, participants with low feel-good goals rated LeVour chocolate as somewhat more instrumental in making them happy when they read an ad that was easy, rather than difficult, to process ($M_s = 3.85$ vs. 3.20); not surprisingly, though, the effect was not significant because ease of processing cannot improve instrumentality of a target object when a goal does not exist, $F(1, 30) = 3.10$, $p_{\text{rep}} > .89$, $\eta^2 = .09$.

Mediation Analyses

Regression analyses revealed a significant interactive effect of goal and processing condition on evaluation of LeVour chocolate ($\beta = .56$, $SE = .17$), $t(81) = 3.33$, $p_{\text{rep}} > .99$; a significant effect of instrumentality of LeVour chocolate on evaluation of the chocolate ($\beta = .67$, $SE = .12$), $t(81) = 5.62$, $p_{\text{rep}} > .99$; and an interactive effect of goal and processing condition on instrumentality of LeVour chocolate ($\beta = .37$, $SE = .13$), $t(81) = 2.82$, $p_{\text{rep}} > .97$. When we included instrumentality of the chocolate as a covariate in the regression measuring the interactive effect of goal and processing condition on evaluation, the effect of instrumentality was significant ($\beta = .60$, $SE = .12$), $t(81) = 4.88$, $p_{\text{rep}} > .99$), and the Goal \times Processing interaction was reduced in significance ($\beta = .33$, $SE = .16$), $t(81) = 2.13$, $p_{\text{rep}} > .92$. Thus, increased perceived instrumentality of LeVour chocolate as a means to fulfill feel-good goals mediated the effect of difficulty of processing on evaluation of the chocolate (Sobel $z = 2.52$, $p < .001$).

GENERAL DISCUSSION

In summary, we argue that an accessible goal evokes a need to assess the usefulness or instrumentality of a particular means in fulfilling that goal. Perception of high effort arising from subjective difficulty of processing the means makes it appear highly instrumental for goal achievement. This occurs because people usually put high effort into whichever means promises goal attainment, and they mistakenly reverse this correlation. Thus, effort is taken as a signal of instrumentality. This inference of instrumentality, in turn, results in higher evaluation of the product in question.

The general logic of the reverse inference (i.e., for goal achievement, useful means require effort, so effort also indicates usefulness of a means) is consistent with many other observations in the ease-of-processing literature; for example, familiar material is easy to process, but people infer familiarity from ease of processing (Schwarz, 2004). The extension to goal pursuit, however, is important because it produces counterintuitive results: In all previous research, ease of processing increased liking of an object, whereas in the studies reported here, difficulty of processing increased liking of an object provided the object was a means to reach a current goal. Notably, merely altering the subjective difficulty of processing an object affects

its perceived instrumentality and, as a consequence, its desirability. We demonstrated this across three experiments.

People liked LeVour chocolate and the Kids In Danger charity more when they had corresponding feel-good or be-kind goals and when information about the chocolate or the charity was subjectively difficult, rather than easy, to process. Self-report measures showed that these effects did not arise from perceived scarcity of the means, from attention to the materials, from perception of goal importance, or from feelings such as arousal. It is also unlikely that post hoc justification of effort, the sunk cost of completing a difficult task, or feelings of relief increased evaluation, which in turn increased perceived instrumentality of the means. First, it is unclear why this should have occurred only among participants primed with goal pursuit. In fact, one might argue that relief after completing a difficult task should be higher among people *not* pursuing a goal, as they have no reason to be investing effort and are more likely to need to justify their sunk cost. Second, if effort justification had occurred, we should have observed a main effect of processing on the attention and arousal measures, which we did not. Finally, and most important, effort justification should have been stronger when participants' attention was directed to effort (in Experiment 3), but instead, the effects were attenuated.

Additional analyses showed that the target was viewed as more instrumental in fulfilling the accessible goal when the target was associated with difficulty, rather than ease, of processing. Also, instrumentality of the means mediated evaluation of the outcome (and was the only such mediator). Attributing effort to the font in Experiment 3 attenuated these effects, and when participants were primed with goal-unrelated statements, or when the target object conflicted with the accessible goal, subjective ease of processing improved evaluation, in line with the results of existing research on ease-of-processing effects.

Thus, this study is important for several reasons. First, it suggests a limitation to the general finding that greater ease of processing is associated with greater liking of the target. It shows that in the context of goal pursuit, difficulty of processing increases liking of a target object. Thus, the specific effect of ease of processing on judgment depends on the naive theory participants bring to bear as an inference rule during judgment. Second, this study established a new (reverse) inference heuristic that is pervasive during judgment—in this case, a rule based on goal pursuit.

Acknowledgments—Funding from the Kilts Center of Marketing, Booth School of Business, University of Chicago, is gratefully acknowledged.

REFERENCES

- Berlyne, D.E. (1966). Curiosity and exploration. *Science*, *153*, 25–33.
 Bornstein, R.F. (1989). Exposure and affect: Overview and meta-analysis of research, 1968–1987. *Psychological Bulletin*, *106*, 265–289.

- Fishbach, A., & Labroo, A.A. (2007). Be better or be merry: How mood affects self-control. *Journal of Personality and Social Psychology*, 93, 158–173.
- Kivetz, R., & Simonson, I. (2002). Earning the right to indulge: Effort as a determinant of customer preferences toward frequency program rewards. *Journal of Marketing Research*, 39, 155–170.
- Lee, A.Y., & Labroo, A.A. (2004). The effect of conceptual and perceptual fluency on brand evaluation. *Journal of Marketing Research*, 41, 151–165.
- Mandler, G., Nakamura, Y., & Van Zandt, B.J. (1987). Nonspecific effects of exposure to stimuli that cannot be recognized. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 13, 646–648.
- Novemsky, N., Dhar, R., Schwarz, N., & Simonson, I. (2007). Preference fluency in consumer choice. *Journal of Marketing Research*, 44, 347–356.
- Quotes, sayings, and aphorisms by Theodore Roosevelt*. (2008). Retrieved November 12, 2008, from <http://www.theodore-roosevelt.com/trquotes.html>
- Reber, R., Winkielman, P., & Schwarz, N. (1998). Effects of perceptual fluency on affective judgments. *Psychological Science*, 9, 45–48.
- Schwarz, N. (2004). Metacognitive experiences in consumer judgment and decision making. *Journal of Consumer Psychology*, 14, 332–348.
- Winkielman, P., & Cacioppo, J.T. (2001). Mind at ease puts a smile on the face: Psychophysiological evidence that processing facilitation elicits positive affect. *Journal of Personality and Social Psychology*, 81, 989–1013.
- Zajonc, R.B. (1968). Attitudinal effects of mere exposures. *Journal of Personality and Social Psychology Monographs*, 9, 1–27.
- Zajonc, R.B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist*, 35, 151–175.

(RECEIVED 3/11/08; REVISION ACCEPTED 7/8/08)