The Bright Side of Dread: Anticipation Asymmetries Explain Why Losses Are Discounted Less Than Gains

David J. Hardisty, University of British Columbia, Canada
Shane Frederick, Yale University, USA
Elke U. Weber, Columbia University, USA

Waiting for gains is a mixed emotional experience that is both pleasurable (due to savoring) and painful (due to impatience), whereas waiting for losses is a more unidimensional painful experience (dread). These findings predict time preferences and explain the "sign effect" in discounting (losses are discounted less than gains).

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The Heart and/or the Mind 2.0: How Affective Inputs Can Improve Our Understanding of Cognitive Processing

Chairs: Hristina Nikolova, Boston College, USA
Cait Lamberton, University of Pittsburgh, USA

Paper #1: (Emotional) Reference Point Formation
Milica Mormann, University of Miami, USA
Luke Nowlan, University of Miami, USA
Joseph Johnson, University of Miami, USA

Paper #2: The Bright Side of Dread: Anticipation Asymmetries Explain Why Losses Are Discounted Less Than Gains
David J. Hardisty, University of British Columbia, Canada
Shane Frederick, Yale University, USA
Elke U. Weber, Columbia University, USA

Paper #3: Do You Know How Much You’ll Hate the Fruit Salad?: Affective Forecasting Ability and Self-Regulatory Success
Hristina Nikolova, Boston College, USA
Cait Lamberton, University of Pittsburgh, USA

Paper #4: Is It More Rational to Say “No”?: How Choosing Versus Rejecting Alternatives Affects Information Processing
Tatiana Sokolova, University of Michigan, USA
Aradhna Krishna, University of Michigan, USA

SESSION OVERVIEW

To say that affect and cognition both shape decision-making is in no way new. However, most of the research to date has studied the affective and cognitive drivers of judgment and decision-making in isolation from each other. In this special session, we present four papers that consider the interplay of affect and cognition and collectively answer the following questions:

- How do incidental, anticipated, and actual emotions shape the building blocks of cognitive activities (e.g., reference point formation, information processing, and intertemporal discounting)?
- Does recognizing these emotional influences allow us to better explain or change effects observed when decision-making is viewed from a purely cognitive perspective?
- Though sharing a fairly tight focus on the above-two questions, the papers in the session approach affect differently enough to offer a range of perspectives. While some examine the influence of incidental affect on otherwise cognitively-driven decisions (Mormann, Nowlan, and Johnson), others focus on integral affect (Hardisty, Frederick, and Weber; Nikolova and Lamberton; Sokolova and Krishna).

The session begins with a paper by Moormann, Nowlan, and Johnson who examine how incidental emotions affect reference point formation in stocks evaluation decisions using eye-tracking. The authors suggest that incidental emotions determine how investors allocate attention to different pieces of financial information when evaluating a stock (initial, current, high, low prices), which, in turn, impacts their reference point for the stock.

The session continues with illuminating our understanding of the interplay between cognition and integral affect. Hardisty, Frederick, and Weber demonstrate that asymmetries in anticipatory affect explain why losses are discounted less than gains (the “sign effect”). Results show that waiting for gains is a mixed emotional experience (pleasurable due to savoring and painful due to impatience), whereas waiting for losses is a unidimensional painful experience. These differences in anticipatory affect mediate the “sign effect” in discounting.

Nikolova and Lamberton examine the role of anticipatory integral affect in self-regulation. The authors demonstrate that individual differences in affective forecasting accuracy predict restraint in emotion-driven domains (food and time management) better than does trait self-control. Further, they find that mispredictions of hedonic (but not self-conscious) affect, drive indulgence, and suggest simple debiasing strategies.

Finally, Sokolova and Krishna take a broader perspective and examine how task type (choice, rejection) alters the impact of the affective, heuristic-based System 1 and deliberative System 2 on decision-making. Using robust judgment and decision-making phenomena (e.g., framing effects), the authors show that task type shifts decision-making from the affective, heuristic-based System-1 processing (in choice) to the deliberative System-2 processing (in rejection).

In sum, the papers in this session (comprising 19 studies and one eye-tracking experiment) advance our theoretical understanding of the affective and cognitive influences on judgment and decision-making from four intriguing perspectives in a variety of disciplines (marketing, psychology, economics, and finance), using different methodologies (lab studies, eye-tracking experiment, and quantitative modeling), and considering a variety of important decisions. We expect the session to be of great interest to a broad audience of researchers working in the areas of judgment and decision-making, affect, cognition, and self-regulation.

(Emotional) Reference Point Formation

EXTENDED ABSTRACT

Reference points influence investor behavior because financial outcomes are coded as gains or losses relative to the reference point. The behavioral finance literature mentions multiple reference points, such as the purchase price or historic highs. However, it is not clear exactly how reference points are formed or “how multiple reference points compete and combine” (Kahneman 1992), and whether transient emotional states influence the combination of multiple reference points.

Here, we use eye-tracking to examine how people form their reference points. In addition, we investigate how incidental emotions affect reference point formation. Recent work has shown that emotions influence financial decisions at the market level (e.g., Edmans, Garcia, and Norli 2007) as well as the individual level (e.g. Lee and Andrade 2011). This area of research emphasizes the underlying role of social inferences in explaining the effect of emotions on decision making. Here, we focus on another mechanism through which emotions should drive decision making; namely, perception and attention.

We suggest that incidental emotions guide investors’ attention when evaluating financial assets, which, as a result, influences their subjective valuation, or reference point, for those assets. Relative to negative emotions, positive emotions have been shown to increase the breadth of attentional processes and guide attention to peripheral stimuli in basic visual tasks (Fredrickson 2001; Wadlinger and Isaacowitz 2006). Building on this research, we designed an experiment in which participants observe stock charts conveying temporally local information (i.e. the current price) and peripheral information (i.e.
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The experiment consisted of two tasks. First, incidental emotion was induced by showing either a joyful, fearful, or emotionally neutral control video. Second, after watching the video, twenty-two subjects viewed stock charts and were asked to determine their “neutral selling price”, i.e., reference point, for each stock across multiple trials (Baucells, Weber, and Welfens 2011). Eye-tracking was used to examine the amount of time people fixated on, i.e., considered, the initial, current, high, and low trading prices on the stock chart as they formed their reference points.

Our eye-tracking data shows that, as individuals form their reference points, the initial and current price receive the most attention, followed by highs, while lows receive very little attention. We find that incidental emotions significantly influence formation of the reference point ($F(2, 232) = 7.13$, $p < .01$); joyful investors form the highest reference points, followed by neutral investors, and finally fearful investors.

Our eye-tracking data reveals that incidental emotions influence how investors allocate their attention to stock charts: attention to the current price is greatest among those in the fear condition ($F(2, 241) = 10.77$, $p < .01$), while attention to the initial and high prices is greatest among those in the joy condition ($F(2, 241) = 10.16$, $p < .01$; $F(2, 231) = 8.59$, $p < .01$, respectively).

Finally, we develop a quantitative model of the underlying process and show that emotions affect how investors allocate their attention and that, in turn, attention affects reference point formation. The model demonstrates that for a given stock graph, attention to the low price decreases the reference point while attention to the high price increases the reference point. For stocks in which the current price was relatively high (i.e., when the stock trend is up), we find that attention to the current price increases the reference point, but we find the reverse when the current price was relatively low (i.e., when the stock trend is down). Follow-up analyses demonstrate that looking times at the current price region mediate the negative effect of fear on reference point when the stock trend is down (indirect effect = -.046; 95% CI: -.108 to -.004), and suppress the negative effect of fear when the stock trend is up (indirect effect = .035; 95% CI: .002 to .110). These findings implicate attention as one of the processes through which incidental emotions influence the reference point.

This research makes important contributions to the decision making literature by highlighting a key situational factor that influences reference point formation; namely, incidental emotions. Further, we build upon findings in the attention and perception literature by demonstrating that the effects of emotion on attentional scope translate to relatively complex information search and judgment contexts. These findings carry implications for household financial decision-making and can help us better understand various market level phenomena, such as the disposition effect.

The Bright Side of Dread: Anticipation Asymmetries Explain Why Losses Are Discounted Less Than Gains

EXTENDED ABSTRACT

The desire to have good things immediately is much stronger than the desire to postpone negative outcomes (Thaler 1981; Haidt and Weber 2009). Though this “sign effect” is a robust result, the reasons for it are not well understood. We hypothesize that the desire to postpone losses is weaker than the desire to accelerate gains because aversive anticipation of bad things is stronger than the pleasurable anticipation of good ones, even after controlling for loss aversion. Anticipation utility predicts lower discount rates for losses, but has little effect on gains, producing the sign effect. This anticipation asymmetry happens because waiting for a gain is a mixed emotional experience that is both pleasurable and painful, whereas waiting for a loss is a more unidimensional painful experience.

Loewenstein (1987) famously found that people were willing to pay more for a kiss from a movie star in three days than for an immediate kiss, and inferred that the increased value of the delayed kiss was driven by savoring. However, we ran several replication studies (Pilot Studies 1-3) and were not able to replicate this finding. This suggests that savoring may be less robust than previously thought. In contrast, several papers have documented the importance of dread in intertemporal choice. For example, Berns and colleagues (2006) assessed dread for electric shocks using both self-report and fMRI of brain activation during the period preceding them. People who reported greater “anticipatory anxiety” exhibited more activity in posterior elements of the cortical pain matrix, and had a stronger preference for immediate shocks. Such results demonstrate the efficacy of self-report measures of dread. The relative strength of anticipation for positive versus negative events, however, has rarely been examined, and is our focus.

In Study 1 ($n = 193$), participants chose between $49 today or $60 in 89 days. These amounts referenced gains or losses depending on the condition to which respondents had been randomly assigned. Participants were then told to “imagine expecting to receive [pay] $60 in 89 days.” and were asked “How psychologically pleasurable or displeasurable would you feel while waiting for it?” They responded on a 201 point bipolar scale ranging from -100 strongly dislike the feeling of waiting” on the left to +100 strongly like the feeling of waiting” on the right, with 0 labeled “neutral.” Participants then answered 26 other choices between smaller smaller sooner and larger later rewards [penalties] (all from Kirby, Petry, and Bickel 1999) and some demographic questions.

Participants’ desire for immediate gains was stronger than their desire to postpone losses, replicating the sign effect. SS rewards were preferred 57% of the time in the gain conditions compared to just 26% preference for LL losses, $t(191) = 10.7, p < .001$. This implies annualized discount rates of 332% for gains and 34% for losses.

Anticipating a future loss was rated as -36 (SD = 46), whereas anticipating a future gain was rated as -5 (SD = 55), $t(191) = 5.6, p < .001, d = 0.8$, supporting our hypothesis. Moreover, these expected anticipatory emotions mediated the sign effect, $p < .001$. The valence of the event in question affects judgments of the associated anticipatory emotions, which in turn predicts time preferences.

In Study 1b ($n = 100$), we show this same pattern of results in a consumer choice setting with a choice between two air conditioning units. One option had a cheaper upfront cost but was energy inefficient, wasting money in the long run. We framed the future energy usage of both models as gains or losses, between subjects. In the positive frame, 59% of participants chose the “impatient” model, compared with 29% in the negative frame, $t(92) = 3.0, p < .01$. Furthermore, this result was mediated by asymmetries in anticipation ratings, replicating Study 1a.

In Study 2 ($n = 169$), we demonstrate the robustness of this anticipation asymmetry across twenty different events (10 gain and 10 loss), including classics from the literature such as the electric shock and kiss from a movie star. We also demonstrate the asymmetry across different time horizons, from 3 days to 5 years.

In Studies 1 and 2, we made no attempt to equate the subjective magnitude of positive and negative events. Thus, our suggestion
that that dread is stronger than savoring may simply reflect the fact that the set of negative events were more psychologically significant than the set of positive events (i.e., loss aversion). We addressed this in Study 3 \((n=106)\) by presenting each participant with pairs of positive and a negative event and dynamically adjusting the magnitudes until each participant was indifferent between accepting or rejecting the pair, indicating that the positive and negative event had been subjectively equated. Notably, the median participant was indifferent between a $25 loss and a $49 gain for the financial items, replicating the 2:1 ratio typically found for loss aversion (Kahneman and Tversky 1979). Participants then gave their time preferences and anticipation ratings for these tailor matched events. The results replicated previous studies, including the sign effect in choices, the asymmetry in anticipation, and the ability of anticipation to predict choices.

If not loss aversion, then what drives this asymmetry in the anticipation? In Study 4 \((n=69)\), we demonstrate that anticipation of gains is a mixed emotional experience, while thinking about losses is a relatively unidimensional experience. Participants rated both the positive and negative anticipation of each event on separate questions. We found that when thinking about receiving a future gain, people look forward to the event and experience some pleasure while imagining it ("savoring"), but also feel some deprivation that they don’t have it yet ("impatience"), and this makes the anticipation somewhat aversive as well. Overall, then, anticipation of gains is neutral or weakly positive. In contrast, when thinking about paying $60 in the future, people dislike thinking about the future loss ("dread"), but derive little positive enjoyment from the fact that they don’t have to pay yet ("enjoying the moment"). The net result is strong disutility when anticipating future losses.

**Do You Know How Much You’ll Hate the Fruit Salad? Affective Forecasting Ability and Self-Regulatory Success**

**EXTENDED ABSTRACT**

Readers of the self-control literature could infer that self-control represents a battle of the mind and the heart, with the mind prompting restraint and the heart prompting indulgence (Shiv and Fedorikhin 1999). When trait self-control operates, cognitive processes effortlessly exert control over impulsive tendencies (Muraven and Baumeister 2000). Then, when cognition is impeded, emotions drive consumption, generally leading to greater indulgence (Shiv and Fedorikhin 1999).

In the present paper, we argue that cognition and emotion cannot be so neatly divided with regard to their impact on self-control. Rather, we suggest that individuals’ affective forecasting ability (AFA) – a cognitive skill that determines the accuracy of one’s predictions about the emotional outcomes of an experience – explains self-regulatory behavior above and beyond trait self-control. This insight is important for two reasons. First, consumers’ affective forecasting accuracy is a skill, not a limited resource such as trait self-control (Muraven and Baumeister 2000). Thus, affective forecasting errors can explain self-control failures even in cases where depletion is unlikely. Second, as it is a cognitive skill, affective forecasting can be improved through simple debiasing interventions, thereby improving restraint without attempting to alter a stable internal trait.

To substantiate these arguments, we first developed a six-item affective forecasting accuracy measure (AFA, sample item: “I usually know how my decisions will make me feel in the future.”) \(a = .94\). The scale was validated in Study 1A using a standard predictor-experimenter paradigm: Seahawks/Patriots fans who scored higher on the AFA had lower forecasting errors in predicting how they would feel after their team lost/won the 2015 Super Bowl \((b = -.21, t(117) = -3.04, p = .003)\). The scale also showed acceptable levels of test-retest reliability (ICC = .71) and theoretically appropriate levels of convergent and discriminant validity (Studies 1B and 1C).

Studies 2A and 2B both establish nomological validity of the AFA scale and distinguish it from the trait self-control scale (Tangney et al. 2004). A pretest revealed that consumers’ self-control decisions are more affect-driven in the food and time management domains and more cognitive-driven in the money domain. As such, we anticipated that AFA will have a stronger predictive power in the former two domains, while trait self-control will be a more powerful predictor of financial self-control decisions. In line with these predictions, Study 2A \((n = 161; 45\% \text{male})\) revealed that trait self-control predicted the amount of money allocated to indulgences in a money budgeting task \((b = -2.89, p = .003)\), but AFA was not a significant predictor \((p = .17)\). In contrast, AFA predicted the time allocated to having fun in a time budgeting task \((b = -2.48, p = .04)\) and the amount of calories and fat in a food selection task \((b = -27.50, p = .05 \text{ and } b = -3.10, p = .005)\). Conversely, trait self-control did not emerge as a significant predictor of self-control decisions in the time management and food domains \((p’s > .40)\).

Study 2B \((n = 52, 51\% \text{ male})\) replicated the food domain findings using a real self-control decision (i.e., a choice between an apple and a cupcake). Results showed that the higher participants’ AFA was, the less likely they were to select the indulgent snack \((b = -.81, p = .03)\). Importantly, even after controlling for trait self-control \((b = -2.0, p = .70)\), AFA still predicted participants’ snack choice \((b = -72, p = .07)\).

Study 3 examines the types of mispredictions that undermine the self-control of low AFA individuals. Participants \((n = 72, 35\% \text{ male})\) first completed the AFA scale. After a filler task, participants were asked to imagine a self-control scenario in which they had to decide between going to a birthday party (vice) and studying for an exam (virtue; Hung and Mukhopadhyay 2012). Participants then forecast the self-conscious (guilt/pride) and hedonic emotions (pleasure/deprivation) they would experience if they make each decision. Finally, participants indicated their decision \((1= "\text{definitely study}" \text{ and } 7= "\text{definitely go to the party}.")\)

The higher participants’ AFA was, the less likely they were to go to the party \((b = -.44, p < .001)\). Furthermore, as AFA rose, individuals forecasted lower levels of negative hedonic emotions (deprivation) from studying for the exam \((b = -2.6, p = .06)\). AFA was also a marginally significant predictor of positive self-conscious emotions (pride) associated with the virtuous decision \((b = .18, p = .08)\). However, AFA did not predict forecasted negative self-conscious emotions (guilt) or positive hedonic emotions (pleasure) associated with the vice decision \((p’s > .12)\). Most importantly, mediation analysis revealed that only the predicted negative hedonic emotions associated with the virtuous decision mediated the relationship between participants’ AFA and their preference to attend the party \((95\% \text{ CI: -.12, -.009})\).

Using this insight, Study 4 tests an intervention designed to improve the accuracy of forecasting negative hedonic emotions associated with virtue consumption. We use surrogation, or using other people’s affective reactions, as a debiasing strategy (Gilbert et al. 2009). Study 4 \((n = 255; 58\% \text{ male})\) used a 2 cell (control/debiasing intervention) between-subjects design with AFA as a second continuously measured factor. Participants were notified that they would participate in a tasting test and asked to choose between a milk chocolate (vice) and a dark chocolate (virtue). Before making their choice, participants in the debiasing condition were given product reviews from prior participants which included information about the level of negative hedonic emotions (e.g., deprivation, missing...
out) experienced from consuming the virtuous product; respondents in the control condition read neutral reviews that lacked any affective information. Results revealed a significant interaction of participants’ AFA and intervention condition (b = -.49, p = .05). Low AFA participants (+1SD) who received the debiasing reviews were more likely to select the dark chocolate than those who received the control reviews (b = .86, p = .01). However, for high AFA participants (+1SD), there was no significant difference between the debiasing and control reviews (p = .79). These results were unchanged when we controlled for participants’ trait self-control (p = .95).

In sum, the current research suggests that affective forecasting accuracy is an important component of successful self-regulation, such that a better ability to correctly predict one’s emotional reactions facilitates restraint in affectively-laden self-control domains. In highlighting this path to restraint, we offer a new hope for individuals who want to avoid indulgence or firms who want to prompt consumers toward restraint—simple interventions that reduce consumers’ need to rely on their own, possibly faulty affective forecasting abilities can reduce impulsive decisions and prompt greater long-term well-being.

**Is It More Rational to Say “No”?: How Choosing Versus Rejecting Alternatives Affects Information Processing**

**EXTENDED ABSTRACT**

Consumers make their decisions in different ways. In some situations, they choose alternatives from a set of available options to form their consideration sets; however, in other situations, they reject (filter out) the less-attractive alternatives from a list of available options. While the two decision strategies (choosing vs. rejecting) should normatively lead to the same outcomes, research in consumer psychology and behavioral economics has shown that oftentimes they produce different decisions (e.g., Laran and Wilcox 2011; Schäffir 1993). In this paper we add to the previous line of work on choice versus rejection by showing that these decision strategies can affect consumer evaluations by shifting the decision-making from the automatic and heuristic-based System-1 processing (in choice), to the deliberative System-2 processing (in rejection).

To develop this prediction we build on research in consumer behavior and cognitive psychology. Rejection is a potential source of “action,” or commission errors: making the wrong rejection decision implies elimination of the best option. In contrast, choice is a source of “inaction,” or omission errors: making the wrong choice decision implies not selecting the right alternative. Because individuals hold themselves more responsible for the negative consequences of commissions, than for those of omissions (Ritov and Baron 1992), they should be more motivated to reduce their potential regret and to deliberate on their decisions in rejection as opposed to choice.

Further, studies looking at the differences between negation and acceptance, two decisions that mirror rejection and choice, suggest that rejection may be less automatic and more deliberative than choice. “Nay-sayers,” who tend to reply “no” to “yes/no” questions and to disagree with Likert-scale items, are more reflective than people who demonstrate an overall agreement tendency (Couch and Keniston 1960). Finally, several studies imply that rejection draws upon cognitive resources and, thus, involves System-2 processing more than does choice (Krishnamurthy and Anish 2008; Laran and Wilcox 2011). For example, Krishnamurthy and Anish found that resource depletion affected decisions in rejection, but not in choice. In sum, prior research indicates that rejection decisions are less automatic, more deliberative, and rely to a greater extent on cognitive resources, all of which imply greater involvement of System-2 processing in rejection tasks.

We tested our prediction across seven studies. To demonstrate that rejection relies more on the deliberative System-2 processing than does choice, in the first three studies we utilized the robust finding that the gains versus losses frames affect choice under System-1 processing, but not under System-2 processing (e.g. De Martino et al. 2006; Simon et al. 2004). In Study 1A, we used the Asian disease problem, wherein people had to consider two programs of combating an unusual disease (Tversky and Kahneman 1981): a riskless program A, and a risky program B. Driven by System-1 processing, people change their preferences across different problem frames: they favor the riskless option in the domain of gains and avoid this option in the domain of losses. Greater involvement of deliberative System-2 processing has been shown to mitigate the effects of problem framing and to produce more consistent preferences across gains and losses frames (De Martino et al. 2006). In line with our predictions regarding greater involvement of System-2 processing in rejection, decision-makers expressed more consistent preferences across the gains and the losses frames when they had to indicate “which plan <they would> reject” (Π gains =48% vs. Π losses =43%, p = .66), than when they had to indicate “which plan <they would> choose” (Π gains =76% vs. Π losses =42%, p = .001). Study 1B and an incentive-compatible Study 1C replicated the moderating effect of task type on framing effects: when asked about monetary gains (vs. losses) people exhibited more consistent preferences in a rejection task (1B: Π gains =54% vs. Π losses =38%, p = .12; 1C: Π gains =41% vs. Π losses =50%, p = .43), compared to a choice task (1B: Π gains =96% vs. Π losses =29%, p = .001; 1C: Π gains =79% vs. Π losses =42%, p = .001).

Study 2 demonstrated the effect of task type on information processing in the context of online reviews. Participants had to remove hotels from (save them to) their list after looking at their aggregate numerical ratings (i.e. aggregate information) and at two of their randomly selected reviews (i.e. anecdotal evidence). People have been shown to discount aggregate information in the face of anecdotal evidence under System-1 processing, but not under System-2 processing (Alter et al. 2007; Kahneman and Tversky 1973). We expected that participants would put more weight on aggregate information in System-2 laden rejection, than in System-1 laden choice. Indeed, rejection reduced the share of hotels with bad ratings and good individual reviews (Π rejection =28% vs. Π choice =99%, p = .028), and increased the share of hotels with good aggregate ratings but bad individual reviews in participants’ consideration sets (Π rejection =31% vs. Π choice =22%, p = .098). Next, Study 3 showed that under rejection instructions people were less likely to opt for the objectively more expensive but seemingly cheap cell phone plan favored under System-1 processing (Π rejection =51% vs. Π choice =70%, p = .045).

Study 4 examined the impact of cognitive depletion hindering System-2 processing on rejection and choice decisions regarding monetary gains (we earlier observed that rejection reduces the System-1 driven preference for riskless gains). We replicated the effect of task type on the preference for the sure gain in the control condition (Π rejection =54% vs. Π choice =81%, p = .009). However, when participants were cognitively depleted, the share of the riskless option in the rejection task increased (p = .04), and the task-type effect was eliminated (Π rejection =75% vs. Π choice =83%, p = .36). Study 5 examined the effect of feeling-based processing – consistent with System-1 – on choice versus rejection decisions regarding monetary gains. We replicated the effect of task type in the control condition (Π rejection =52% vs. Π choice =95%, p < .001). However, when the instructions induced a feeling-based evaluation, the share of the riskless option in the rejection task increased (p = .02), and the difference...
between the rejection and choice tasks was reduced ($\Pi_{\text{rejection}} = 73\%$ vs. $\Pi_{\text{choice}} = 89\%, p = .027$).

This research shows that choosing versus rejecting alternatives determines how the information about the attributes is processed. In addition, this research introduces task type as a novel moderator of the framing effects, documented both in behavioral economics and consumer psychology.

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