Take It or Leave It:

How Choosing versus Rejecting Alternatives Affects Information Processing

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ABSTRACT

People can make decisions by choosing or by rejecting alternatives. This research shows that changing a task from choice to rejection makes people more likely to rely on deliberative processing, what we label the task-type effect. To demonstrate this effect, we use a set of established decision biases that can be attenuated under deliberative processing. We show that changing a task from choice to rejection makes people express more consistent preferences between safe and risky options in the Asian disease problem (Study 1A) and in financial decision-making (Study 1B), even with real monetary consequences (Study 1C). Further, switching a task from choice to rejection increases the quality of consideration sets in the context of hotel reviews (Study 2), and leads to more rational decisions in the context of cell phone plan selection (Study 3). Studies 4 and 5 tap into the process underlying the effect of task type. We demonstrate that a rejection task produces decisions similar to those observed in a choice task when decision-makers are cognitively depleted (Study 4), or encouraged to rely on their feelings (Study 5). The findings provide insight into the effect of task type on deliberation and decision outcomes.

Keywords: choice and rejection, information processing, framing effects

Consumers make their decisions in different ways. In some situations, they choose alternatives from a set of available options to form their consideration sets; in other situations they reject the less-attractive alternatives from a list of available options. For instance, when consumers use Pinterest, they "pin," or choose, the most interesting items. In contrast, when they review jobs on LinkedIn, they can only hide, or reject, the less attractive jobs from their suggestion lists. By the same token, GMAT test-takers sometimes have to choose the correct logical argument in support of the focal claim; but, sometimes they have to eliminate, or reject, the logically flawed argument from the set of available alternatives. Finally, irrespective of the context, people can adopt different decision strategies on their own. For instance, when shopping online, consumers can place only their most preferred items into their shopping carts, or they can put multiple items into their carts and then reject the products that are relatively less attractive before proceeding to the checkout.

While the two decision strategies (choice vs. rejection) should normatively lead to the same outcomes, research in consumer psychology and judgment and decision-making has shown that oftentimes they produce different decisions (Dhar and Wertenbroch 2000; Laran and Wilcox 2011; Shafir 1993). People adopt different selection criteria (Yaniv and Schul 2000) and allocate different weights and amounts of attention to disparate types of information in choice versus rejection decisions (Laran and Wilcox 2011; Meloy and Russo 2004; Shafir 1993). Rejection produces larger consideration sets (Yaniv and Schul 1997, 2000; Huber, Neale, and Northcraft, 1987) and causes preference reversals by increasing the impact of negative (Shafir 1993) and preference-inconsistent attributes in decision-making (Laran and Wilcox 2011). In this article, we add to the previous line of work on choice versus rejection by showing that people are more likely to rely on deliberative processing in rejection (vs. choice) tasks.

We test our conceptualization across seven studies. To demonstrate that rejection relies on more deliberative processing compared to choice, we use a set of established decision biases that can be attenuated under deliberative processing. We then compare the magnitude of these biases across choice and rejection decisions. In studies 1A-C, we first replicate the robust finding that framing options as gains versus losses affects decisions in choice tasks (De Martino et al. 2006; Simon, Fagley, and Halleran 2004; Tversky and Kahneman 1981). We then show that such gain versus loss framing changes decisions to a significantly lesser extent in rejection tasks – consistent with more deliberative processing. In studies 2 and 3 we examine the effect of choice versus rejection tasks in the contexts of online reviews (Study 2) and complex product purchases (Study 3) – in both studies, we show that people make more rational and objectively superior decisions in rejection. In studies 4 and 5 we find direct evidence of the mechanism underlying the effect of task type on decision-making. In line with our theorizing, we find that rejection decisions become similar to choice decisions when people are cognitively depleted (Study 4) or are encouraged to rely on their feelings (Study 5).

Our work contributes to the literature on choice versus rejection effects by demonstrating that task type (choice vs. rejection) not only affects the importance and evaluations of specific attributes pertaining to the alternatives (Laran and Wilcox 2011; Meloy and Russo 2004; Shafir 1993), but also changes the way in which the information about the alternatives is processed. We demonstrate that changing the task from choice to rejection makes people more likely to use deliberative processing. At the same time, we identify task type as a novel boundary condition reducing the impact of gain versus loss framing and increasing the impact of aggregate versus anecdotal evidence on individual decisions. In terms of practical implications, we show that website interface decisions – such as opting-in (choosing), or hiding (rejecting) buttons, can

affect how consumers process information about the available alternatives and impact their preferences.

The remainder of the article is organized as follows. We first discuss the literature pertinent to this research and build up our main prediction. Next, we describe our seven studies and their findings. Finally, we discuss the theoretical and practical implications of our research, rule out possible alternative accounts, and outline the directions for future research.

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Several prior studies have directly focused on the effect of choice versus rejection, uncovering the effects of task type on the size of the consideration sets, attention to specific attributes, attribute weights, as well as specific attribute evaluations. In terms of the consideration set size, research indicates that – with "not choosing" being the status-quo in choice tasks and "not rejecting" being the status-quo in rejection tasks – people tend to include fewer options into their consideration sets in choice versus rejection. For example, people shortlist significantly fewer job applicants when their task is to select the applicants they would interview, as opposed to eliminate the applicants they would not interview for a job (Huber et al. 1987). Similar findings have been obtained in the contexts of career counselling and general knowledge testing (Yaniv and Schul 1997, 2000; Krishnamurthy and Nagpal 2008).

Furthermore, choice and rejection direct decision-makers' attention to different attributes of the alternatives, and lead to preference reversals. For example, Shafir (1993) proposes that choice makes people focus on positive attributes, while rejection makes them focus on negative attributes. Consistent with this task-compatibility framework, options with "enriched" positive and negative attributes (e.g. high quality and high price) are preferred to the "impoverished"

options (e.g. average quality and average price) in a choice task, but are no longer preferred to them in a rejection task (Shafir, 1993). In a similar vein, Laran and Wilcox (2011) suggest that rejection prompts elaboration on preference-inconsistent attributes, or attributes that are considered less important given the currently active goals. For example, people seeking "indulgence" focus on proximity to nightlife when choosing apartments, and focus on price when rejecting them.

Finally, Meloy and Russo (2004) show that task type not only affects the attention allocated to different attributes, but also influences the evaluations of those attributes. In their studies, participants' evaluations of positively-valenced attributes became more extreme when they had to choose (vs. reject) one of the two alternatives. The opposite was true for negatively-valenced attributes – a result attributed to greater information distortion in task-compatible decisions (Meloy and Russo 2004; DeKay, Patiño-Echeverri, and Fischbeck 2009).

In this article, we focus on another aspect of the decision-making process that is affected by changing the task from choice to rejection. Specifically, we examine how rejection affects the extent to which people rely on deliberative processing in their decisions. We discuss this next.

Rejection and Deliberative processing

We propose that a rejection task will induce more deliberative processing, compared to a choice task. Below, we build on research in consumer behavior and cognitive psychology to develop this prediction.

Losses, and Attention to Negative Attributes. First, rejection decisions trigger consideration of loss of one or several foregone options (Dhar and Wertenbroch 2000; Park, Jun, and Macinnis 2000). Consideration of losses has been recently linked to greater visual attention

(Hochman and Yechiam 2011), and more rational decisions in risky choices (Yechiam and Hochman 2013). By the same token, consideration of losses (e.g. price increases), compared to potential gains (e.g. price discounts), has been shown to attenuate price framing effects, a result consistent with the idea that loss considerations should enhance deliberation (Chatterjee, et al. 2000). With loss considerations being more prominent in rejection, consumers should be more prone to deliberation in rejection compared to choice.

Aside from the focus on the losses, a greater focus on negative attributes in rejection (Shafir 1993) can also trigger more deliberative processing. Studies show that negative information can prompt greater deliberation (Kuvaas and Selart 2004; Malkoc, Hedgcock, and Hoeffler 2012). For example, decision-makers exhibit better information recall after receiving negatively framed information, compared to positively framed information (Kuvaas and Selart 2004). Similarly, people exhibit more vigilant processing when deciding among unattractive (vs. attractive) alternatives: they are less affected by irrelevant decoy options when they see their choice alternatives as relatively unattractive (vs. attractive) (Malkoc, et al. 2012).

Negation and Deliberation. Next, studies looking at the difference between acceptance and negation, two decisions that mirror choice and rejection, are also pertinent to our research. For example, early correlational studies on acceptance and negation suggest that "yea-sayers" – people who tend to reply "yes" to "yes/no" questions — are more impulsive and emotional, and less prone to exhibit inhibition and control. In contrast, "nay-sayers" — people who exhibit an overall disagreement tendency — are more reflective and analytical, are less likely to behave impulsively, and more likely to deliberate on their responses (Couch and Keniston 1960).

Furthermore, when put under cognitive load, people become less likely to deny facts (Gilbert, Tafarodi, and Malone 1993; Knowles and Condon 1999), a result which is consistent

with the basic proposition that negation entails the cognitively demanding deliberative processing to a greater extent than does acceptance. It should be noted that the above findings merely imply an association between negation and deliberation, and do not allow us make inferences regarding causal links between negation and deliberative processing. However, these findings are generally consistent with our main proposition that rejection, a decision which parallels negation, should have a stronger association with deliberative processing compared to choice.

Other Research. Finally, several prior studies, though not designed to investigate the role of deliberative processing in rejection, give further support to our prediction. For example, a study by Heller and colleagues (2002) shows that people are significantly more likely to use the exclusion (i.e. rejection) versus the inclusion (i.e. choice) decision strategy when answering questions that have a correct answer (e.g., "Which <city> hosted the Olympic Summer Games of 1976?''), compared to personal judgment questions (e.g., ''Which <city> would make the best site for future Olympic Summer Games?"). In other words, people are more prone to use rejection for questions requiring conscious deliberation; and to use choice for questions that could be answered by relying on their feelings, – a result implicating an association between rejection and deliberative processing.

Further, several studies imply that rejection draws upon cognitive resources more than choice does, meaning that rejection might involve more deliberative processing compared to choice (Krishnamurthy and Nagpal 2008; Laran and Wilcox 2011). As discussed earlier, Laran and Wilcox (2011) find that people prefer the indulgent alternative in a choice task and the relatively less indulgent (but cheaper) alternative in a rejection task. More importantly, their results indicate (in their Study 4) that cognitive load affects rejection more than choice.

Krishnamurthy and Nagpal (2008) find a similar pattern of results for the effect of cognitive depletion on rejection versus choice. Taken together, these results indicate that rejection relies on a limited pool of cognitive resources to a greater extent than choice does.

Based on the prior research discussed here, we propose that *decisions entail more deliberative processing in rejection tasks (vs. choice tasks)*. For easier explication, we call this the task-type information processing effect, or *the task-type effect*. We test this proposition using a set of established decision biases that are attenuated under greater deliberation. Across seven studies we replicate previously observed decision biases using a choice task and then, we show that these effects are reduced if we use a rejection task.

STUDY 1A: REJECTION AND FRAMING EFFECTS IN THE ASIAN DISEASE PROBLEM

The goal of study 1A was to test the effect of task type on gain versus loss framing effects using the Asian disease problem scenario. In the standard formulation of the Asian disease problem, people choose between two programs of combatting an unusual Asian disease (Tversky and Kahneman 1981): a riskless program A, and a risky program B. Depending on how the options are described (as gains vs. losses), people change their preferences between the two programs: they tend to select the riskless option in the domain of gains ("200 people <out of 600> will be saved") and tend to avoid this option in the domain of losses ("400 people <out of 600> will die"). Importantly, the gain-loss framing effect is reduced under deliberative processing. For example, the effect is weaker among people high in need for cognition and math skills (Simon et al. 2004; Smith and Levin 1996). By the same token, recent neuro-imaging data

suggests that cognitive effort reduces gain-loss framing effects, by making people less likely to choose the safe option in the domain of gains (Gonzalez, et al. 2003).

Per our theorizing, when working on a rejection task versus a choice task, people should rely more on deliberative processing. Thus, we expected to replicate the standard framing effect when people have to *choose* one of the two programs - A or B. We expected that this framing effect would be attenuated when people have to *reject* one of the two programs.

Design and Procedure

M-Turk panelists were invited to fill out a short computer-based survey for a small monetary compensation. The study adopted a 2 (framing: gain vs. loss) × 2 (task: choice vs. rejection) between-subjects design. The participants read the hypothetical Asian disease problem scenario proposed by Tversky and Kahneman (1981). Depending on their experimental condition, they read the problem either in the gain or the loss frame (frame condition). Their task was to choose or to reject (task condition) one of two programs, the riskless program A or the risky program B.

As discussed earlier, people tend to select the riskless program A in the domain of gains; however, they tend to select the risky program B, and to avoid the riskless program A in the domain of losses. For the sake of exposition, we will refer to the shifts in preferences across gain and loss frames as "*framing effects,*" and to the shifts in preferences across choice and rejection tasks as "*task-type effects.*" We will refer to our dependent variable as "*decision outcome.*" See table 1 for the decision options in the four conditions.

Insert table 1 about here

After making their decision in the Asian disease problem, the participants in the gain (loss) frame answered a question regarding the number of lives that would be saved (lost) with program A – this served as an attention check.

Data and Results

Two hundred and three M-Turk panelists took part in the study. Four participants were from outside the US and were removed. Three participants were removed due to repeat participation. Twelve participants failed the attention check. The final sample included 184 participants (108 male).

To analyze the effect of problem framing on decisions across the two task types, we ran a binary logistic regression. We used decision outcome – the selection of the riskless versus risky program – as the dependent variable. The dependent variable was set to 0 when a participant selected (i.e., chose or did not reject) the riskless program and to 1 when she selected the risky program. Frame (gain vs. loss), task type (choice vs. rejection) and their interaction were the independent variables – frame was set to 0 (1) when the problem was framed in terms of losses (gains); task type was set to 0 (1) when the task was to choose (reject) one of the two programs.

The analysis revealed a significant effect of frame on decision outcome (b = -1.49, p = .001) and no significant effect of task type (b = -0.06, p = .88). There was a significant interaction between frame and task type (b = 1.31, p = .035). In the *choice task*, where participants had to choose one of the two programs, 76% selected the riskless option in the gain frame, compared to only 42% in the loss frame (Wald χ^2 = 10.88, p = .001), replicating prior

findings. However, in the *rejection task*, where participants had to reject one of the two programs, 48% selected (i.e. did not reject) the riskless option in the gain frame, compared to 43% in the loss frame (Wald $\chi^2 = 0.19$, $p = .66$) – thus, the effect of gain-loss framing was reduced in the rejection task. These results support our main hypothesis (see Figure 1).

Insert figure 1 about here

Discussion

Study 1A showed that rejection reduces the framing effect in the Asian disease problem. Taken together with prior findings on the moderating role of deliberative processing in framing effects (Gonzalez et al. 2003; Simon et al. 2004), this result provides preliminary evidence that participants' decisions are more deliberative in rejection compared to choice.

STUDY 1B: REJECTION AND FRAMING EFFECTS IN GAMBLING DECISIONS

Study 1B was designed to conceptually replicate the results observed in study 1A using a different gain-loss framing scenario. We used a modified version of the scenario used by Tversky and Kahneman (1981), wherein people had to choose between two monetary gains or two monetary losses. We expected to replicate the standard framing effect in the choice task, that is, to find that people are more (less) likely to choose the riskless option A when it offers a sure gain (sure loss). We expected that this framing effect would be attenuated in the rejection task.

Design and Procedure

M-Turk panelists were invited to fill out a short computer-based survey for a small monetary compensation. The study adopted a 2 (framing: gain vs. loss) × 2 (task: choice vs. rejection) between-subjects design. The expected utility of each option was a monetary gain in the gain frame condition and a monetary loss in the loss frame condition. The participants had to choose or to reject one of the two options. See table 2 for the decision options in the four conditions.

Insert table 2 about here

Note that in the original design, Tversky and Kahneman (1981) set the expected values of the sure gain ($240) and the gamble ($250) to be slightly different. This allowed for a stronger test of their theory in the domain of gains where a perfectly rational decision-maker would actually prefer the gamble (and not simply be indifferent between the two options). The expected values of the sure option and the gamble were identical in the loss frame in the original scenario by Tversky and Kahneman (1981) (-$750). To allow for a strong test of their theory even in the domain of losses (and for symmetry), we modified the original task and set the value of the safe option at -$740, such that the perfectly rational decision-maker would prefer the guaranteed loss in this task. Following the decision regarding the two options the participants answered an attention check question regarding the amount of money gained (lost) with option A.

In addition to participants' decisions regarding the two options, we also recorded their response times in the main task in this study and in subsequent studies. It is assumed that longer response times are indicative of more deliberative processing. Although several researchers have

questioned the validity of response time data analysis in detecting more (vs. less) deliberative

processing (Evans, Dillon, and Rand 2015; Krajbich, et al. 2015), we collected response time

data in our studies. Assuming that longer response times are associated with more deliberative

processing, we expected that the participants would take longer to make their decisions in the

rejection (vs. choice) task.

Data and Results

Two hundred and three M-Turk panelists took part in the study. Eight participants were

from outside the US and were removed. An additional twenty-two participants failed the

attention check. The final sample included 173 participants (99 male).

To analyze the effect of problem framing on decisions across the two task types we ran a

binary logistic regression similar to the one used in study 1A – with decision outcome as the

dependent variable; and frame (gain vs. loss), task type (choice vs. rejection), and their

interaction as the independent variables.

The analysis revealed a significant effect of frame on decision outcome (b = -3.56, $p <$

.001) and no significant effect of task type (b = -0.40, p = .39). There was a significant

interaction between frame and task type (b = 2.87, $p <$ .001). In the *choice task*, where

participants had to choose one of the two options, 96% selected the riskless option in the gain

frame, compared to only 29% in the loss frame (Wald χ^2 = 26.68, p = .001), replicating prior

findings. However, in the *rejection task*, where participants had to reject one of the two options,

54% selected (i.e. did not reject) the riskless option in the gain frame, compared to 38% in the

loss frame (Wald χ^2 = 2.42, p = .12). Thus, the effect of problem framing was reduced in the

rejection task. These results support our main hypothesis (see Figure 2).

Insert figure 2 about here

Response Time Data. We analyzed participants' response times in the main task. In this and subsequent studies participants' response times were log-transformed and trimmed at 2 SD from their respective group means (Fazio 1990). A two-way ANOVA with frame and task type as between-subjects factors revealed a significant effect of frame ($M_{gain} = 2.65$ vs. $M_{loss} = 2.87$, $F(1, 162) = 7.38$, $p = .007$), meaning that decisions took longer in the domain of losses than in the domain of gains. The analysis also revealed a marginally significant effect of task type ($M_{choice} = 2.69$ vs. $M_{rejection} = 2.83$, $F(1, 162) = 2.99$, $p = .086$). Thus, in this study, participants took longer to make their decisions in the rejection (vs. choice) task, consistent with expectations. The interaction between frame and task type was not significant.

Discussion

The results of study 1B conceptually replicate the findings of study 1A. In this study we used the domain of monetary gains and losses to show that rejection reduces the effect of gain-loss framing.

STUDY 1C: REJECTION AND FRAMING EFFECTS IN AN INCENTIVE-COMPATIBLE TASK

The goal of study 1C was to conceptually replicate the results of the first two studies using an incentive compatible procedure. As in study 1B we used the context of monetary gains

and losses, adopting a modified version of the scenario used by De Martino and colleagues (2006). We expected to replicate the standard gain-loss framing effect in the choice task, and expected that the framing effect would be attenuated in the rejection task.

Design and Procedure

Students at a large North American university participated in a computer-based study in exchange for course credit. The study adopted a 2 (framing: gain vs. loss) × 2 (task: choice vs. rejection) between-subjects design.

At the beginning of the study, participants were told that we would randomly select four study participants who would be paid per their decisions in the study. Next, they were presented with the hypothetical scenario proposed by De Martino and colleagues (2006). The scenario said that they would receive $50, but would not be able to retain this initial amount of $50 with certainty. Instead, they had to select one of two options: a sure option or a gamble. Participants' response times were recorded.

Table 3 summarizes the decision options in the four conditions. Note that unlike in study 1B, the expected values of the riskless and risky options are identical within and across the gain frames ($20 out of $50 for both options) and the loss frames (- $30, leaving participants with $20 out of $50).

Insert table 3 about here

Data and Results

One hundred fifty-eight undergraduate students participated in the study (65 male).

To analyze the effect of problem framing on decision outcomes across the two task types we ran a binary logistic regression similar to the one used in studies 1A and 1B – with decision outcome as the dependent variable; and frame (gain vs. loss), task type (choice vs. rejection) and their interaction as the independent variables.

The analysis revealed a significant effect of frame on decision outcome (b = -1.65, p = .001) and no significant effect of task type (b = -0.32, p = .49). There was a significant interaction between frame and task type (b = 2.01, p = .003). When the task was to choose one of the two options, 79% of participants selected the riskless option in the gain frame, compared to 42% in the loss frame (Wald χ^2 = 10.92, p = .001), replicating the framing effect. However, when the task was to reject one of the two options, 41% of participants selected (i.e. did not reject) the riskless option in the gain frame, compared to 50% in the loss frame (Wald χ^2 = 0.63, p = .43) – i.e., the effect of problem framing was reduced in the rejection task. These results support our main hypothesis.

Response Time Data. A two-way ANOVA with frame and task type as between-subjects factors revealed a significant effect of frame (M_{gain} =3.14 vs. M_{loss} = 3.27, $F(1, 148)$ = 4.77, p = .031), meaning that decisions took longer in the domain of losses than in the domain of gains. The effect of task type was not significant (M_{choice} =2.20 vs. $M_{rejection}$ = 2.22, $F < 1$). The interaction between frame and task type was not significant.

Discussion

Study 1 C replicates the results of the first two studies and demonstrates that rejection reduces the effect of problem framing in an incentive compatible framework.

STUDY 2: REJECTION AND THE ROLE OF AGGREGATE VS. ANECDOTAL EVIDENCE

Study 2 tested the effect of task type in the context of online reviews where people typically receive two types of information: an aggregate rating based on ratings from multiple users, and a sample of individual ratings and verbal reviews. Prior research has shown that people often discount aggregate numerical information in the presence of anecdotal evidence (Alter et al. 2007; Tversky and Kahneman 1973; Yang, Saini, and Freling 2015). For example, when asked to evaluate the probability that Jack is an engineer, people may ignore the proportion of engineers in the sample and rely on Jack's verbal description instead, a decision bias often referred to as base rate neglect (Tversky and Kahneman 1973). Similarly, when choosing between two insurance plans offered by companies A and B, people can disregard the aggregate satisfaction ratings of the two companies, and instead rely on the personal experience of a specific consumer when making their decisions (Yang, et al. 2015). Importantly, the tendency to discount aggregate numerical information in the face of anecdotal evidence is reduced under more deliberative processing (Alter et al. 2007; Yang, et al. 2015). Since, per our theorizing, rejection tasks entail more deliberation compared to choice tasks, we expected that users would give more weight to aggregate numerical ratings versus anecdotal evidence in rejection tasks compared to choice tasks.

Design and Procedure

M-Turk panelists were invited to fill out a short computer-based survey for a small monetary compensation. The study adopted a 2 (task type: choice vs. rejection) × 2 (information type: "bad rating-good reviews" vs. "good rating-bad reviews") mixed factorial design. Task type was manipulated between subjects. Information type was manipulated within subjects.

Participants had to narrow down a list of 12 hotels to a smaller set by either saving attractive hotels to their list (choice) or by removing unattractive hotels from their list (rejection). For each hotel participants received information about its aggregate numerical rating based on at least 120 user ratings (i.e. aggregate information). In addition, they saw two sample ratings and verbal reviews from individual users (i.e. anecdotal information). We acknowledge that processing large amounts of anecdotal information (vs. aggregate ratings) requires substantial effort, making reliance on anecdotal information as deliberative as reliance on aggregate ratings. Thus, to ensure that greater reliance on aggregate versus anecdotal information was indicative of deliberative processing, we limited the number of individual ratings and reviews to two. At the beginning of the study the participants saw the following instructions:

"You will get information about twelve hotels, one hotel at a time. On each screen you will see the ratings (on a scale from 1 to 10) and randomly selected reviews of a given hotel. Your task is to narrow down the selection of twelve hotels to a few attractive options. You will do that by saving hotels to your list (removing hotels from your list). The hotels you save (do not remove) would be the hotels you consider to be attractive. Read the information carefully and decide for each hotel whether you would like to save it to your list (remove it from your list)."

Out of the 12 hotels, 4 hotels had bad aggregate ratings but good individual ratings and reviews, and 4 hotels had good aggregate ratings but bad individual ratings and reviews; the

remaining 4 hotels served as fillers and had moderate aggregate numerical ratings and moderate individual ratings and reviews. For all 12 hotels, participants got aggregate "overall" numerical ratings, and also ratings for value, staff, facilities, location, comfort and cleanliness; these six specific dimension ratings were highly correlated (alpha = .99), and were averaged to form the "overall" ratings. Additionally, for each hotel, participants saw two sample ratings and reviews. Examples of each information type ("bad rating—good reviews," "good rating—bad reviews," "filler") are presented in Appendix A. Examples of screen shots are presented in Appendix B.

Hotels were presented one at a time, in random order. The task was self-paced. After participants had seen the information for each hotel and decided which hotels to choose (reject) to form their final lists, we asked them several follow-up questions. First, we asked them to rate the importance of five different pieces of information – overall numerical ratings, numerical ratings on specific dimensions, number of reviews, individual reviews and individual ratings – in their decisions about the hotels. They rated how important each of the five pieces of information was on a 5-point scale (1 = not at all; 5 = very much). Next, as an attention check, participants answered whether they were saving hotels to their list or removing hotels from the list. Finally, they filled out their demographic information.

We expected that participants in the rejection task would assign greater importance to the aggregate (aggregate ratings) versus anecdotal information (two individual ratings and reviews), and be less likely to select "bad rating—good reviews," compared to participants in the choice task. By the same token, we expected that participants in the rejection task would be more likely to select "good rating—bad reviews" hotels, compared to participants in the choice task. We did not expect to find significant differences across the two tasks for "filler" hotels. Fillers were

included to prevent the participants from guessing the hypothesis and to avoid perfect multicollinearity.

Pretest

We pretested our stimuli to ensure that the "mismatch" between aggregate ratings and individual ratings and reviews did not raise any suspicions regarding the quality of the information about the 12 hotels. The participants read information about 12 hotels provided by an online booking website. Next, they indicated to what extent they perceived the website to be typical, normal, and odd (reverse-coded) on a 7-point scale anchored on "not at all" on the left and "very" on the right. After that, the participants rated the online booking website on its overall quality, the quality of its rating system, and the quality of its review system, using a 7-point scale anchored on "very low" on the left and "very high" on the right.

Fifty M-Turk panelists completed the pretest. Two participants were from outside the US and were excluded. The final sample included 48 participants (31 male). We computed the means of typicality ($\alpha_{typicality} = .92$) and quality ratings ($\alpha_{quality} = .89$) to create aggregate typicality and aggregate quality ratings respectively. A one-sample t-test indicated that participants' ratings of website typicality were significantly above the midpoint of the typicality scale ($M_{typicality} = 4.88$, $t = 3.90$, $p < .001$). Similarly, a one-sample t-test indicated that participants' ratings of website quality were significantly above the midpoint of the quality scale ($M_{quality} = 4.60$, $t = 3.12$, $p = .003$). Thus, the pretest indicated that the information about the 12 hotels was perceived as typical and of relatively high quality.

Data and Results

One hundred and twenty-one M-Turk panelists took part in the study. One participant was from outside the US and was removed. Two participants were removed due to repeat participation. One participant failed the attention check. The final sample included 117 participants (57 male).

We analyzed the shares of hotels with bad ratings and good reviews and the shares of hotels with good ratings and bad reviews across conditions in a repeated measures ANOVA. For each participant, we computed the share of "bad rating—good reviews" hotels on the final list; and the share of "good rating—bad reviews" hotels on the final list.

Note that the number of hotels in the final set can be lower in the choice versus the rejection task due to the status-quo bias (the status-quo being "not to choose" in the choice task vs. "not to reject" in the rejection task) (Huber, et al. 1987; Yaniv and Schul 1997, 2000). This was indeed the case in our data ($M_{choice} = 5.76$ vs. $M_{rejection} = 6.67$, $F(1, 115) = 8.71$, $p = .004$). Consequently, using the absolute number of hotels on the list as the dependent measure was going to reduce the difference between choice and rejection tasks for the "bad rating—good review" hotels and inflate the difference for the "good rating–bad review" hotels. Thus, we used percentages instead of absolute measures in our analysis.

The model included task type (choice vs. rejection) as a between-subjects factor, information type (bad rating—good review vs. good rating—bad review) as a within-subjects factor, and their interaction. The share of fillers was not included in the model to avoid perfect multicollinearity ($\Pi_{filler} = 1 - (\Pi_{good} + \Pi_{bad})$). There were no significant differences in the shares of fillers across choice and rejection tasks ($\Pi_{choice} = 39\%$ vs. $\Pi_{rejection} = 41\%$, $F < 1$).

The shares of "bad rating—good reviews" hotels, and of "good rating—bad reviews" hotels across the two task-type conditions are presented in Figure 3. There was no main effect of review type ($F(1, 115) = 2.43$, $p = .122$) or condition ($F < 1$). The analysis revealed a significant interaction between task and information type ($F(1, 115) = 4.15$, $p = .044$). Simple contrasts revealed that, in line with our predictions, the share of "bad rating—good reviews" hotels was lower in the rejection (vs. choice) task condition ($\Pi_{choice} = 39\%$ vs. $\Pi_{rejection} = 28\%$, $F(1, 115) = 4.96$, $p = .028$). Further, simple contrasts showed that the share of "good rating—bad reviews" hotels was marginally higher in the rejection (vs. choice) condition ($\Pi_{choice} = 22\%$ vs. $\Pi_{rejection} = 31\%$, $F(1, 115) = 2.78$, $p = .098$).

Insert figure 3 about here

Response Time Data. In this study, we expected response time data to follow a different pattern. We expected the participants to focus more on aggregate (i.e. aggregate ratings) versus anecdotal (i.e. two individual ratings and reviews) information in rejection compared to choice. Since processing aggregate ratings can be less time-consuming than processing individual ratings and reviews, we expected respondents to take less (and not more) time with rejection vs. choice. The response time pattern is generally aligned with these predictions. The regression analysis with task type and information type dummies as independent variables indicated that effect of task type was not significant ($b_{rejection} = -0.10$, $p = .428$). However, decisions took directionally less time in the rejection (vs. choice) task. In addition, decisions regarding "good rating—bad reviews hotels" took longer compared to decisions regarding "bad rating—good reviews hotels" ($b_{bad\ rating—good\ reviews} = 0.23$, $p < .001$) and "filler hotels" ($b_{filler} = 0.24$, $p < .001$).

Mediation analysis: We expected that participants would assign greater importance to aggregate ratings versus anecdotal information in rejection (vs. choice). This difference in the importance assigned to the two types of information was expected to mediate the effect of task type on the shares of "bad rating—good reviews" and "good rating—bad reviews" hotels.

To test our predictions, we ran a mediation analysis with the INDIRECT macro by Preacher and Hayes (2008). The first mediation model used task type as the independent variable (task = 1 in rejection condition; task=0 in choice condition), the importance of aggregate (i.e. the overall rating) versus anecdotal information (computed as the average of individual ratings and individual reviews; $r = .86$, $p < .001$) as the mediator, and the share of "bad rating—good reviews" hotels as the dependent variable. The second mediation model used the share of "good rating—bad reviews" hotels as the dependent variable and was otherwise identical to the first model.

The first equation in models 1 and 2 is the same and the results indicated that task type had a marginally significant positive effect on the importance assigned to aggregate versus anecdotal information ($b = 0.57$, $t = 1.66$, $p = .099$). This suggests that in line with our predictions, when the task changed from choice to rejection, people assigned greater importance to aggregate versus anecdotal information. The second equation in model 1 (model 2) indicates that the importance assigned to aggregate versus anecdotal information had a significant negative effect on the share of "bad rating—good reviews" hotels ($b = -0.10$, $t = -12.49$, $p < .001$) (a significant positive effect on the share of "good rating—bad reviews" hotels ($b = 0.11$, $t = 12.30$, $p < .001$)). The results of equation 2 in the two models suggest that when the importance of aggregate versus anecdotal information increased, the share of "bad rating—good reviews" hotels in participants' consideration sets decreased and the share of "good rating—bad reviews"

hotels increased. Finally, the third equation in model 1, which focused on the mean indirect effect of task type on the share of "bad rating—good review" hotels through importance of aggregate versus anecdotal information (based on 1,000 bootstrap samples), was marginally significant, with a point estimate of -0.06 and a 90% confidence interval excluding zero (-0.11 to -0.00). Similarly, the third equation in model 2 focusing on the mean indirect effect of task type on the share of "good rating—bad review" hotels through importance of aggregate versus anecdotal information (based on 1,000 bootstrap samples), was also marginally significant, with a point estimate of 0.06 and a 90% confidence interval excluding zero (0.00 to 0.12). Together, results from the three equations making up mediation models 1 and 2 indicate that the effect of task type on the shares of "bad rating—good reviews" and "good rating—bad reviews" hotels was mediated by the importance of aggregate versus anecdotal information. Figures 4a and 4b present the results of the mediation analysis.

Insert figures 4a-4b about here

Discussion

Study 2 showed that hotels with bad ratings and good reviews were *less* likely to be shortlisted when participants were rejecting (vs. choosing) hotels. In contrast, hotels with good ratings and bad reviews were *more* likely to be shortlisted when participants were rejecting (vs. choosing) hotels. Consistent with the idea that deliberative processing plays a greater role in rejection versus choice, participants assigned greater importance to aggregate versus anecdotal

information when they were removing hotels from their lists (i.e. rejecting), as opposed to when they were adding hotels to their lists (i.e. choosing).

STUDY 3: REJECTION AND DECISION-MAKING IN A COMPLEX TASK

Study 3 focused on differences between choice and rejection in the context of complex and cognitively demanding decisions. We used a complex phone plan selection decision proposed by Mishra, Mishra and Nayakankuppam (2007). In the scenario people had to choose between two cell phone plans: one with fewer "anytime" minutes and a lenient penalty for exceeding the monthly limit of "anytime" minutes; and another, objectively superior, plan with more "anytime" minutes and a strict penalty structure (Cheema and Patrick 2012; Mishra et al. 2007). Prior research has shown that people tend to focus on the visually salient penalty aspect of the plan description, resulting in sub-optimal decisions. However, when prompted to rely on deliberative processing, they consider both the number of anytime minutes and the penalty structure, resulting in better decisions (Cheema and Patrick 2012). Thus, in this study we examine phone plan selection decisions across choice and rejection tasks, expecting to replicate prior results with the choice task and to observe more optimal decisions in the rejection task.

Design and Procedure

M-Turk panelists were invited to fill out a short computer-based survey for a small monetary compensation. The study adopted a single-factor (task type: choice vs. rejection)

between-subjects design. The participants made a decision by choosing (rejecting) one of the following cell phone plans:

a) *Plan from Firm A which offers 160 anytime minutes for $19.99 a month;*

b) *Plan from Firm B which offers 200 anytime minutes for $19.99 a month.*

In making their decisions, participants had to additionally consider the penalties for exceeding the respective monthly limits of Firms A and B. The charges for exceeding the monthly limits are presented in table 4 (see Appendix C for screenshots).

Insert table 4 about here

If one focuses on the relatively salient table of penalties for exceeding the monthly limit, one feels that Plan A is more frugal. However, a more careful evaluation of the two plans reveals that Plan B is actually the frugal one – Plan B offers more minutes for the same amount of money, and imposes the same penalty as plan A for exceeding the 200-minute time limit. While choosing Plan B is the correct decision, people tend to select the relatively more expensive Plan A (Mishra, et al. 2007; Cheema and Patrick 2012). We predicted that presenting the decision regarding the two plans as a rejection task would enhance deliberative processing and reduce the share of Plan A. After submitting their decision regarding the two options, participants were transferred to the next screen where, as an attention check, they had to report the number of minutes offered by plan A. Participants' response times in the main task were recorded.

Data and Results

One hundred and forty-two M-Turk panelist took part in the study. One participant was from outside the US and was removed. One participant was removed due to repeat participation. Twenty nine participants failed the attention check. The final sample included 111 participants (68 male).

To analyze the effect of task type on the selection of the expensive cell phone plan we used a one-tailed Fischer's exact test. The analysis revealed that people were less likely to select (i.e. not reject) the expensive Plan A in the rejection task: 70% of participants selected the more expensive phone plan A in the choice task condition, but only 51% of participants selected it in the rejection task condition ($p = .034$).

Response Time Data. A one-way ANOVA with task type as a between-subjects factor revealed a significant effect of task type ($M_{choice} = 3.62$ vs. $M_{rejection} = 3.87$, $F(1, 107) = 5.58$, $p = .020$) on response times in the phone plan selection task. As expected, participants took significantly longer to make their decisions in the rejection (vs. choice) task in this study.

Discussion

In this study we find further support for our main proposition by showing that rejection affects performance in the context of complex product purchases. Prior studies have shown that enhancing the role of deliberative processing (Cheema and Patrick 2012), makes people more likely to make the correct decision in the cell phone plan scenario. Supporting the proposition

regarding the enhanced role of deliberative processing in rejection, our results show that rejection also increases the quality of decisions in the cell phone plan scenario.

STUDY 4: ROLE OF COGNITIVE DEPLETION

Study 4 tested the underlying mechanism of the task-type effect. In this study, we introduced a cognitive depletion manipulation for some of the participants. We expected that cognitive depletion would make people less likely to engage in deliberative processing. As such, we expected cognitive depletion to make rejection decisions more similar to choice decisions, thus diminishing the task-type effect.

To induce cognitive depletion we used the Stroop color identification task (1935). The Stroop (1935) task is considered to be cognitively depleting since it requires that people override their initial tendency to read the word (an automatic response); and name its color instead (Pocheptsova et al. 2009; Webb and Sheeran 2003). We expected that the cognitive depletion manipulation would affect participants' subsequent decisions concerning two monetary gains and make the participants in the rejection task condition behave more similarly to the participants in the choice task condition.

Design and Procedure

Students at a large North American university participated in a computer-based study in exchange for course credit. The study adopted a 2 (task: choice vs. rejection) $\times$ 2 (cognitive depletion: control vs. depleted) between-subjects design.

The study was comprised of two parts. The first part of the study was adapted from Webb and Sheeran (2003) and was based on the Stroop task (1935). In this part participants were presented with 48 words, one word at a time. Each word represented the name of a color ("BLUE," "GREEN," "RED," "YELLOW") and was displayed using a font of one of four colors ("BLUE," "GREEN," "RED," "YELLOW"). Importantly, 75% of the words did not match the color of the ink they were typed in. For example, the word "YELLOW" could have been colored green. At the bottom of the computer screen were four buttons with the names of the four ink colors used in the task. The names of the colors on the response buttons were colored black.

Participants assigned to the control condition were instructed to merely read the color words. Participants assigned to the cognitive depletion condition were instructed to click on the button matching the color of the font and to ignore what any given word said. Thus, when the word "YELLOW" was typed in green ink, participants in the cognitive depletion condition were supposed to respond "GREEN." Participants completed 48 such screens.

In the second part of the study, participants read a hypothetical scenario about two monetary gains used in study 1B. They had to make a decision by choosing or rejecting one of the following gains:

(A) A sure gain of $240;

(B) 25% chance to gain $1000, and 75% chance to win nothing.

Note that we used the gain frame and not the loss frame, since we had previously found bigger differences between choice and rejection tasks in the gain frame (see studies 1A-1C). Finally, as an attention check, participants had to recall the amount of money they would gain with the riskless option A. Participants' response times in the main task were recorded.

Data and Results

One hundred and seventy-nine undergraduate students participated in the study. Eight participants did not follow the instructions in the cognitive depletion task (color identification rate < 50%) and were excluded. Four participants failed to correctly recall the amount of money they would gain with the riskless option and were excluded. The final sample included 167 participants (68 male).

To analyze the effect of task type (rejection coded as 0, choice coded as 1) on the share of the riskless option (i.e. the sure gain) across two cognitive depletion conditions (control coded as 0, cognitive depletion coded as 1), we ran a binary logistic regression. Decision outcome served as the dependent variable; task type, cognitive depletion, and their interaction served as the independent variables.

The analysis revealed a significant effect of task type (b = -1.31, p = .009) and of cognitive depletion (b = -0.96, p = .044). The interaction between task type and cognitive depletion did not reach statistical significance (b = 0.80, p =.284). Replicating the results of study 1B in the *control* condition, 81% of participants opted for the riskless gain in the choice task, compared to 54% in the rejection task (Wald χ^2 = 6.89, p = .009). But, when participants were *cognitively depleted*, the difference between the choice and rejection tasks was directionally reduced. Now, 83% of participants opted for the riskless option in the choice task condition, compared to 75% in the rejection task condition (Wald χ^2 = 0.86, p = .36), meaning that the task-type effect was eliminated in the cognitive depletion condition.

Importantly, in line with our conceptualization, we observed that cognitive depletion had no effect on the share of the riskless gain in the *choice* condition ($\Pi_{control}$ = 81% vs. $\Pi_{cognitive\ depletion}$ = 83%, Wald χ^2 = 0.08, p = .78). In contrast, the cognitive depletion manipulation

significantly increased the share of the riskless option in the *rejection* condition ($\Pi_{control} = 52\%$ vs. $\Pi_{cognitive\ depletion} = 73\%$, Wald $\chi^2 = 4.05$, $p = .044$). Figure 5 presents the shares of the riskless option across the four conditions.

Insert figure 5 about here

Response Time Data. A two-way ANOVA with task type and cognitive depletion as between-subjects factors revealed no significant main effects of task type ($M_{choice} = 2.84$ vs. $M_{rejection} = 2.78$, $F(1, 156)=1.33$, $p = .250$) or cognitive depletion ($M_{control} = 2.80$ vs. $M_{cognitive\ depletion} = 2.82$, $F(1, 156)=0.05$, $p = .819$) on response times in the gain selection task. The interaction between task type and cognitive depletion was marginally significant ($F(1, 156)=2.91$, $p = .090$). Contrary to the pattern observed in studies 1B, 1C and study 3, simple contrasts indicated that in the control condition people look less time to make their decisions in the rejection (vs. choice) task ($M_{choice} = 2.88$ vs. $M_{rejection} = 2.72$, $F(1, 156) = 4.09$, $p = .045$). The effect was directionally reversed and no longer significant in the cognitive depletion condition ($M_{choice} = 2.80$ vs. $M_{rejection} = 2.83$, $F(1, 156) = 0.15$, $p = .697$).

Discussion

The results of study 4 show that cognitive depletion increased the share of the riskless option in the rejection task and made people act more similarly to people in the choice task. Thus, in line with our reasoning, the results of study 4 indicate that deliberative processing is the driver of the proposed task-type effect.

STUDY 5: ROLE OF FEELING-BASED EVALUATION

Study 5 further examined the underlying mechanism of the task-type effect. In this study, we manipulated the extent to which participants rely on their feelings when making their decisions, expecting them to engage in less deliberative processing in the feeling-based evaluation condition. As such, we expected the feeling-based evaluation condition to make rejection decisions more similar to choice decisions, thus diminishing the task-type effect.

Design and Procedure

M-Turk panelists were invited to fill out a short computer-based survey for a small monetary compensation. The study adopted a 2 (task: choice vs. rejection) × 2 (evaluation: control vs. feeling-based) between-subjects design. Similar to study 4, we used the gain frame scenario from study 1B. Participants had to make a decision by choosing or rejecting one of two monetary gains – a riskless versus a risky option. We also manipulated the evaluation basis by asking participants in the feeling-based condition to think about "how they felt about each of the two options," before making their decision regarding which option to choose (reject). Participants in the control condition did not receive such instructions, and merely had to choose (reject) one of the two options. Additionally, in this study we randomized the order of the two options to rule out the possibility that the data pattern is driven by participants' tendency to choose or reject the first option they see (Mantonakis et al. 2009). Next, as an attention check, participants had to recall the amount of money they would gain with the riskless option. Participants' response times in the main task were recorded.

Data and Results

Two hundred and sixty-four M-Turk panelists took part in the study. Six participants were from outside the US and were removed. Nine participants were removed due to repeat participation. Ten participants failed the attention check. The final sample included 239 participants (135 male).

Order had no significant main or interaction effects ($p > .50$) and the data was collapsed across the two orders. To analyze the effect of task type (rejection coded as 0, choice coded as 1) on the share of the riskless option (i.e. the sure gain) across the two evaluation conditions (control coded as 0, feeling-based coded as 1), we ran a binary logistic regression. Decision outcome was the dependent variable; task type, evaluation mode, and their interaction were the independent variables. The analysis revealed a significant effect of task type on decision outcome (b = -2.89, $p < .001$) and a significant effect of evaluation type (b= -0.91, $p = .018$). There was also a significant interaction between task type and evaluation condition (b = 1.75, $p = .035$).

Replicating the results of study 1B in the *control* condition, 95% of participants opted for the riskless gain in the choice task, compared to 52% in the rejection task (Wald $\chi^2 = 20.08$, $p < .001$). When the instructions induced a *feeling-based* evaluation of the two alternatives, the difference between the choice and rejection tasks was reduced. Now, 89% of participants opted for the riskless option in the choice task, compared to 73% in the rejection task (Wald $\chi^2 = 1.15$, $p = .03$). Feeling-based evaluation instructions had no effect on the share of the riskless gain in the *choice* condition ($\Pi_{\text{control}} = 95\%$ vs. $\Pi_{\text{feeling-based}} = 89\%$, Wald $\chi^2 = 1.32$, $p = .25$). In contrast, the feeling-based evaluation manipulation significantly increased the share of the riskless option

in the *rejection* condition ($\Pi_{control}$ = 52% vs. $\Pi_{feeling\text{-}based}$ = 73%, Wald χ^2 = 5. 56, p = .02). Figure 6 presents the shares of the riskless option across the four conditions.

Insert figure 6 about here

Response Time Data. Neither order nor its interactions with other factors had a significant effect on response times (all F < 1), so we collapsed the data across the two order conditions. A two-way ANOVA with task type and evaluation type as between-subjects factors revealed a significant effect of task type (M_{choice} = 2.51 vs. $M_{rejection}$ = 2.67, $F(1, 222)$ = 8.26, p = .004) on response times in the gain selection task. In this study, again, participants took significantly longer to make their decisions in the rejection (vs. choice) task. The analysis also revealed a main effect of evaluation type ($M_{control}$ = 2.48 vs. $M_{feeling\text{-}based}$ = 2.70, $F(1, 222)$ = 16.19, p < .001): people took longer to make their decisions in the feeling-based (vs. control) condition. The latter result can be attributed to the word count difference across the two conditions ($n_{control}$ = 32 vs. $n_{feeling\text{-}based}$ = 54). The interaction between task type and evaluation type was not significant.

Discussion

The results of study 5 show that inducing feeling-based processing in the rejection task made participants act more similarly to participants in the choice task. Thus, the results indicate that deliberative processing serves as the driver of the proposed task-type effect.

GENERAL DISCUSSION

We show across a set of decision contexts that changing a task from choice to rejection makes people more likely to use deliberative processing – what we label the *task-type effect*. We replicate prior results pertaining to various decision biases in choice tasks (e.g., gain-loss framing in studies 1A, 1B, 1C; discounting of aggregate information in study 2; use of salient cues in study 3); and show that the results change in rejection tasks, becoming more consistent with deliberative processing. Thus, we contribute to the literature on choice and rejection by showing that task type not only changes the weights allocated to option attributes (Laran and Wilcox 2011; Shafir 1993), but also determines how the information about the options is processed.

In study 1A, we use the Asian disease problem to demonstrate that a rejection task makes people less susceptible to framing effects, compared to a choice task. In study 1B and in an incentive-compatible study 1C we replicate the moderating effect of task type on framing effects in the context of monetary gains and losses. It is worth noting that in studies 1A-1C the effect of task type was only present in the domain of gains (all $p < .01$), but not in the domain of losses (all $p > .30$). As discussed earlier, decisions in the domain of losses are, by default more likely to be driven by deliberative processing (Chatterjee et al. 2000; Yechiam and Hochman 2013). Thus, the fact that the rejection task, expected to enhance deliberative processing, did not affect participants in the loss frame is consistent with our theorizing.

Next, in study 2, we demonstrate the effect of task type on information processing in the context of online reviews. We find that a rejection task reduces the share of hotels with bad aggregate ratings but good individual reviews, and increases the share of hotels with good aggregate ratings but bad individual reviews, in users' consideration sets. In study 3, we test the effect of task type in a complex product purchase scenario, where people have been shown to

make sub-optimal decisions (Mishra et al. 2007; Cheema and Patrick 2013). We replicate prior research findings with a choice task. We then show that people are less likely to select the objectively more expensive but seemingly cheap cell phone plan A, versus the objectively superior plan B, in a rejection task, an outcome consistent with greater deliberation in rejection tasks.

Studies 4 and 5 provide evidence that deliberative processing underlies the task-type effect. Study 4 shows that cognitive depletion reduces the task-type effect such that people in a rejection task behave more similarly to those in a choice task. This suggests that rejection involves greater use of cognitive resources and, thus, entails more deliberative processing. Study 5, analogously, shows that when people are encouraged to rely on their feelings, their decisions in a rejection task are closer to the decisions in a choice task – again, indicating that rejection involves more deliberative processing compared to choice.

In sum, in seven studies we demonstrate that decision-making becomes more consistent with deliberative processing when a rejection (vs. choice) task is used. We also show that when people are less likely to rely on deliberative processing (e.g. when cognitively depleted or encouraged to rely on their feelings), the reported effect of task type is attenuated. It should be noted that the results for the effect of task type on participants' response times are not unequivocal. Studies 1B, 3, and 5 indicate that decisions took significantly longer in rejection (vs. choice) tasks, and study 1C shows no significant difference across conditions (Study 2 has a predicted reverse pattern that is supported). However, study 4 shows a contrary pattern. Nonetheless, in an unreported meta-analysis of the response times across the studies (i.e., studies 1B, 1C, 3, 4 and 5; we exclude study 2 where we did not expect rejection to take longer than

choice) we find an overall positive effect of rejection on response times ($d = .20$, $z = 2.79$, $p = .005$), consistent with the idea that rejection entails more deliberative processing.

Alternative Accounts

Prior research has provided substantial insight into the differences between choice and rejection in terms of the underlying evaluation processes and resulting preferences. In this section, we elaborate on the link between our findings and those reported in prior research, and rule out some alternative explanations of our results.

Elaboration on Preference-inconsistent Attributes (Laran and Wilcox 2011). Laran and Wilcox propose that choice versus rejection can shift preferences towards options consistent versus inconsistent with the currently activated preferences and goals. Their results are aligned with our conceptualization. The main premise of this article is that rejection enhances deliberative processing. Greater deliberation, in turn, should increase decision-makers' propensity to override their automatic responses (Evans and Stanovich 2013). Priming manipulations used by Laran and Wilcox could have created such automatic responses (e.g. priming savings would make the cheap option the intuitive response). According to our theory, in a choice task participants would be more likely to select the primed, or the intuitively appealing option. In contrast, in a rejection task participants would become more likely to override their intuition and less likely to select (i.e. not reject) the primed alternative – a prediction consistent with the data pattern observed in the experiments by Laran and Wilcox.

At the same time, we do not think that the framework proposed by Laran and Wilcox can fully account for the empirical evidence reported in this article. The notion of active preferences and goals (e.g. indulge vs. save money on an apartment) is central to their theory. However, the

presence of baseline preferences and goals is somewhat unlikely in several of the scenarios used in this article, such as the Asian disease problem scenario (Study 1) or the online hotel reviews scenario (Study 2). In sum, while our framework is consistent with the empirical evidence reported by Laran and Wilcox, their theoretical framework cannot account for all our findings.

Task-compatibility Framework (Shafir 1993). One may also suggest that the pattern of results in some of our studies (e.g. the Asian disease problem in Study 1A and the gambling scenario is Study 1C) could be explained by the task-compatibility framework proposed by Shafir (1993). According to the task-compatibility framework, choice makes people focus more on the positively-valenced (vs. negatively-valenced) attributes of each option – for instance, the number of lives saved in the Asian disease scenario. In contrast, rejection makes them focus more on the negative (vs. positive) attributes – the number of lives lost. A focus on the 200 lives saved with certainty in a choice task should increase the share of the riskless option in the gains frame. A focus on the number of lives lost in a rejection task should make people more likely to infer that 400 people will die if the "200 lives saved" option is taken in the gains frame. Consequently, per the task compatibility account, the share of the riskless option in the gain frame would go down in a rejection (vs. a choice) task. However, the data pattern observed in the loss frame in our studies is not as easily explained by this alternative account. We find that task-type does not affect decisions in the loss frame, yet Shafir's framework would predict a difference between choice and rejection in the loss-frame as well. We run a simulation with 5,000,000 observations (details in web appendix A) to create the data pattern following from Shafir's framework. The simulation does not support the task-compatibility framework as an explanation of our results.

Additionally, the results of study 3 run counter to what Shafir's framework would predict. According to the task-compatibility framework people should have been focusing more on the minutes offered (the benefit, or the positively-valenced attribute) versus the penalties charged (the cost, or the negatively-valenced attribute) in the choice task; and focusing more on the penalties changed versus the minutes offered in the rejection task. In the choice task, an increased focus on the number of minutes offered (160 min. in Plan A and 200 min. in Plan B) combined with little attention to the penalties charged should have lead the participants to prefer Plan B to Plan A. In contrast, in the rejection task, an increased focus on the penalties (lenient in Plan A and strict in Plan B) combined with little attention to the number of minutes offered should have lead the participants to prefer Plan A to Plan B. However, the opposite was true: people were less likely to choose Plan A in the rejection task than they were in the choice task (Π_{choose} = 70% vs. Π_{reject} = 51%). At the same time, this pattern is consistent with our hypothesis that rejection entails more deliberative processing, whereby people are more likely to consider both the number of minutes offered and the penalties charged in the cell phone plan scenario.

Implications for Practice

Our research offers several practical implications for consumers and managers. Our findings imply that people could benefit from reformulating their decisions into rejection tasks when they want to behave more rationally. For example, when looking at websites that provide overall ratings of different options (e.g. hotels, restaurants, movies), as well as sample reviews for these options, they may try rejecting alternatives to form their consideration sets, if they want to be more rational. Similarly, when working on a difficult test, test-takers may be better off by first considering the alternatives that should be filtered out, instead of focusing on which option

to choose, since the latter strategy can make the test-takers choose the option that immediately "feels" right, and less likely to carefully elaborate on their decision.

From the perspective of firms, we suggest that website designers pay greater attention to website interfaces – whether they involve opting-in (choosing), or hiding (rejecting) buttons. Our findings imply that Pinterest, a website mostly used for recreational purposes and, thus, less congruent with deliberative processing, should adopt the "opt-in" interface, which Pinterest does. Similarly, Linked-In and Research Gate, websites supporting job search – a process which requires considerable deliberation – seem to follow the right strategy when providing the option to "hide" the unattractive job offers.

Future Research

An important question that remains to be addressed in future research pertains to the moderating effect of individual differences on the effects of task type. We would speculate that the motivation to do well in a task, and cognitive ability, would increase deliberation in choice tasks more than in rejection tasks, and reduce the task-type effects reported in the current article.

Future research could also examine the effect of deliberative processing manipulations across choice versus rejection conditions. We find that rejection decisions become similar to choice decisions when people are less prone to rely on deliberative processing (Study 4 and Study 5). Yet, one may wonder whether choice decisions would become more similar to rejection decisions when people are prompted to rely on deliberation or are encouraged to ignore their feelings. While we believe that this is possible, we also think that there could be potential asymmetries in decision-makers' propensity to shift *from* versus *to* deliberative processing.

Specifically, we expect that people are more easily swayed away from deliberative processing in rejection than towards it in choice. Further research could address this question.

At the same time, while we do believe that rejection can prompt deliberative processing and increase decision quality in contexts beyond those explored in the current article, it would be important to explore potential boundary conditions and reversals of the observed effects. For example, increased deliberation associated with rejection could potentially increase the amount of motivated reasoning and information distortion, making people more likely to arrive at their "desired," but not necessarily accurate, conclusions (Kunda 1990; Meloy and Russo 2004; Mishra, Shiv and Nayankankuppam 2008; Risen 2015). Similarly, rejection may produce less accurate decisions in contexts where reliance on feelings and intuitions is actually beneficial. Recent research suggests that feeling-based (vs. deliberative) processing may sometimes lead to superior decision outcomes (Dijksterhuis 2004; Pham, Lee, and Stephen 2012). For example, feeling-based processing can outperform deliberation in contexts where access to unconsciously acquired information (e.g. weather patterns) is necessary to make more accurate decisions (Pham, et al. 2012). An exploration of the effects of rejection in similar contexts could provide insights into the boundary conditions of the task-type effect.

In conclusion, whereas the boundary conditions of the task-type effect merit further exploration, this research shows that formulating a task as a choice or as a rejection has important implications for how consumers evaluate alternatives, and for what decisions they make.

Data Collection Information

The first author managed the collection of data for studies 1A, 1B, 2, 3, 5 using the Mechanical Turk online panel between fall 2014 and fall 2015. The first author managed the data collection for studies 1C and 4 at University of Michigan Ross Behavioral Research Lab in fall 2015 using the help of research assistants. The first and second authors jointly analyzed these data.

Appendix A. EXAMPLES OF RATINGS AND REVIEWS USED IN STUDY 2

	Rating	Randomly selected hotel reviews
BAD RATING – GOOD REVIEW	Rating from 138 users **6.7** Value for money: 6.9 Staff: 6.8 Facilities: 6.5 Location: 6.8 Comfort: 6.6 Cleanliness: 6.7	John, USA **9.6** The staff was amazing! Joshua at the front desk was great! I loved the room style, we overlooked the city on the 13th floor. This hotel smells like the beach! It is a wonderful soothing scent..:) Overall it was a nice stay and the location was great. Terry, USA: **8.9** I have never been more impressed with the value of a hotel. The hotel staff was also very polite and accommodating. My two business colleagues traveling with me were just as impressed. I would stay here every trip to the city.
GOOD RATING – BAD REVIEW	Rating from 137 users **9.1** Value for money: 8.8 Staff: 9.1 Facilities: 9.2 Location: 9.4 Comfort: 9.1 Cleanliness: 8.9	Marc, USA: **7.1** Nothing was replaced in my room. When I drank my 2 small bottles of water they were never replaced. When I used the 1 chamomile tea bag it was never replaced. I don't think I should have to ask to have water in my room daily or tea bags. Very disappointing. Bill, USA: **7.3** The front desk staff were good. Parking was the worst. Shower leaking all over bath floor. Elevators appeared to be having some serious issues including very long waits all the time for one to come.
FILLER	Rating from 134 users **7.6** Value for money: 7.7 Staff: 7.6 Facilities: 7.4 Location: 7.8 Comfort: 7.8 Cleanliness: 7.5	Deanna, USA: **7.7** The hotel is nicely designed and is clean. They're having some "break-in" issues such as bad light bulbs and misaligned glass shower doors. The location is convenient for accessing public transport. Sean, USA: **7.4** The hotel is within walking distance of many attractions as well as train and bus stops which will take you to farther-off places of interest. Good places to eat nearby as well. The staff was helpful.

Appendix B. SCREENSHOTS OF THE MAIN TASK IN STUDY 2

TASK TYPE: CHOICE

Please read the information about a hotel provided by an online booking website carefully. WOULD YOU SAVE THIS HOTEL TO YOUR LIST?

HOTEL	
Rating from 127 users **9.1** Value for money: 8.9 Staff: 9.2 Facilities: 9.3 Location: 8.9 Comfort: 9.0 Cleanliness: 9.2	<u>Sarah, USA</u> **6.5** I liked the sheets and the shower. I did not like the old and depressing rooms with strange headboards, horrible and uncomfortable lobby. Unprofessional staff, I was awakened by a 3:30 am call from the front desk asking if I was honoring my reservation, I was already there!!! <u>Jim, USA:</u> **6.3** The location is good. Yet, the rooms feel tired and the staff carry enough attitude to make you feel that the soul (and any semblance of hospitality) has gone out of this hotel. This level of snootiness may have cut in when the place was happening in the 90's but now it just feels clichéd.

SAVE TO LIST   **CONTINUE**
    ○   ○

TASK TYPE: REJECTION

Please read the information about a hotel provided by an online booking website carefully. WOULD YOU REMOVE THIS HOTEL FROM THE LIST?

HOTEL	
Rating from 135 users **6.7** Value for money: 6.4 Staff: 7.7 Facilities: 6.7 Location: 6.9 Comfort: 6.3 Cleanliness: 6.5	<u>Ben, USA</u> **9.0** We loved everything - from the moment we got there until we left, we were treated so well by every single member of staff. Every request was efficiently handled with a pleasant smile. We normally stay at a different hotel, but not any more – this hotel will be our hotel of choice. <u>Bob, USA:</u> **9.2** This hotel was totally a-ma-zing!!! The rooms were comfortable and the view was stunning. The staff was very welcoming, super friendly and extremely helpful. We got their full attention every time we needed them. The concierges got us into the best and hippest restaurants.

REMOVE FROM LIST   **CONTINUE**

Appendix C. SCREENSHOTS OF THE MAIN TASK IN STUDY 4

TASK TYPE: CHOICE

DECISION ABOUT A PHONE PLAN

You want to buy a cell phone with a wireless plan. Two firms in your area offer such plans, Firms A and B. Both firms charge the same monthly charges of $19.99 and offer a free cell phone, unlimited night and weekend minutes, and free voice mail.

However, both firms impose a per-minute fee if you use more than the given number of anytime minutes. Firm A provides 160 anytime minutes per month and Firm B provides 200 anytime minutes per month. The schedule of charges for exceeding these anytime minutes are as follows:

If you exceed anytime minutes by:	Firm A imposes ($ per minute)	Firm B imposes ($ per minute)
10 minutes	0.00	2.00
20 minutes	0.25	2.00
30 minutes	0.50	2.00
40 minutes	1.00	2.00
More than 40 minutes	2.00	2.00

You can only buy one plan, so you need to CHOOSE ONE OF THE TWO PLANS.
WHICH PLAN WOULD YOU CHOOSE?

○ PLAN A
○ PLAN B

>>

TASK TYPE: REJECTION

DECISION ABOUT A PHONE PLAN

You want to buy a cell phone with a wireless plan. Two firms in your area offer such plans, Firms A and B. Both firms charge the same monthly charges of $19.99 and offer a free cell phone, unlimited night and weekend minutes, and free voice mail.

However, both firms impose a per-minute fee if you use more than the given number of anytime minutes. Firm A provides 160 anytime minutes per month and Firm B provides 200 anytime minutes per month. The schedule of charges for exceeding these anytime minutes are as follows:

If you exceed anytime minutes by:	Firm A imposes ($ per minute)	Firm B imposes ($ per minute)
10 minutes	0.00	2.00
20 minutes	0.25	2.00
30 minutes	0.50	2.00
40 minutes	1.00	2.00
More than 40 minutes	2.00	2.00

You can only buy one plan, so you need to REJECT ONE OF THE TWO PLANS.
WHICH PLAN WOULD YOU REJECT?

○ PLAN A
○ PLAN B

>>

Appendix D. STIMULI USED IN STUDY 5

		EVALUATION	
		CONTROL	FEELING-BASED
TASK TYPE	CHOICE	You need to choose one of the two options: A. a sure gain of $240 B. 25% chance to gain $1000, and 75% chance to gain nothing **Which option would you CHOOSE? (95%*)**	You need to choose one of the two options: A. a sure gain of $240 B. 25% chance to gain $1000, and 75% chance to gain nothing **Think about how you feel about each of the two options and decide which option you LIKE MORE.** **Based on that decide – which option would you CHOOSE? (89%*)**
	REJECTION	You need to reject one of the two options: A. a sure gain of $240 B. 25% chance to gain $1000, and 75% chance to gain nothing **Which option would you REJECT? (52%*)**	You need to reject one of the two options: A. a sure gain of $240 B. 25% chance to gain $1000, and 75% chance to gain nothing **Think about how you feel about each of the two options and decide which option you LIKE LESS.** **Based on that decide – which option would you REJECT? (73%*)**

*Share of the riskless option

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Losses on Cognitive Performance," *Cognitive Psychology,* 66 (2), 212-31.

Table 1. Decision options in the four conditions of Study 1A.

| | | FRAME | |
		GAIN	LOSS
TASK TYPE	**CHOICE**	(A) If program A is adopted, 200 people will be saved. (B) If program B is adopted, there is a one-third probability that 600 people will be saved and a two-thirds probability that no people will be saved. **Which Program would you CHOOSE?**	(A) If program A is adopted, 400 people will die. (B) If program B is adopted, there is a one-third probability that nobody will die and a two-thirds probability that 600 people will die. **Which Program would you CHOOSE?**
	REJECTION	(A) If program A is adopted, 200 people will be saved. (B) If program B is adopted, there is a one-third probability that 600 people will be saved and a two-thirds probability that no people will be saved. **Which Program would you REJECT?**	(A) If program A is adopted, 400 people will die. (B) If program B is adopted, there is a one-third probability that nobody will die and a two-thirds probability that 600 people will die. **Which Program would you REJECT?**

Table 2. Decision options in the four conditions of Study 1B.

		FRAME	
		GAIN	LOSS
TASK TYPE	CHOICE	(A) A sure gain of $240 (B) 25% chance to gain $1000, and 75% chance to gain nothing **Which option would you CHOOSE?**	(A) A sure loss of $740; (B) 75% chance to lose $1000, and 25% chance to lose nothing **Which option would you CHOOSE?**
	REJECTION	(A) A sure gain of $240 (B) 25% chance to gain $1000, and 75% chance to gain nothing **Which option would you REJECT?**	(A) A sure loss of $740; (B) 75% chance to lose $1000, and 25% chance to lose nothing **Which option would you REJECT?**

Table 3. Decision options in the four conditions of Study 1C.

| | | FRAME | |
		GAIN	LOSS
TASK TYPE	CHOICE	(A) keep $20 (B) 40% chance to keep all ($50), and 60% chance to keep nothing **Which option would you CHOOSE?**	(A) lose $30; (B) 40% chance to lose nothing, and 60% chance to lose all ($50) **Which option would you CHOOSE?**
	REJECTION	(A) keep $20 (B) 40% chance to keep all ($50), and 60% chance to keep nothing **Which option would you REJECT?**	(A) lose $30; (B) 40% chance to lose nothing, and 60% chance to lose all ($50) **Which option would you REJECT?**

Table 4. Penalty structure for exceeding the monthly limit in Firm A and Firm B.

Penalty for exceeding anytime minutes by	Firm A imposes (per minute) ($)	Firm B imposes (per minute) ($)
10 minutes	0.00	2.00
20 minutes	0.25	2.00
30 minutes	0.50	2.00
40 minutes	1.00	2.00
More than 40 minutes	2.00	2.00

Figure 1. STUDY 1A: REJECTION TASK REDUCES FRAMING EFFECT
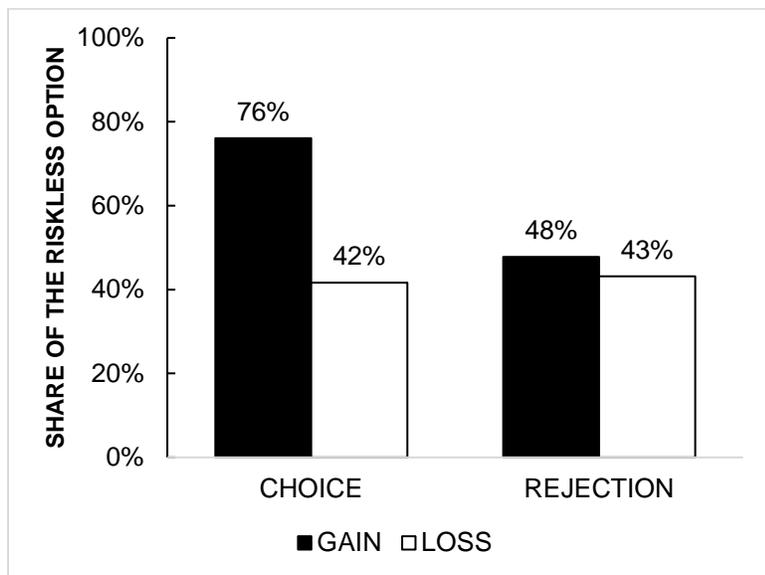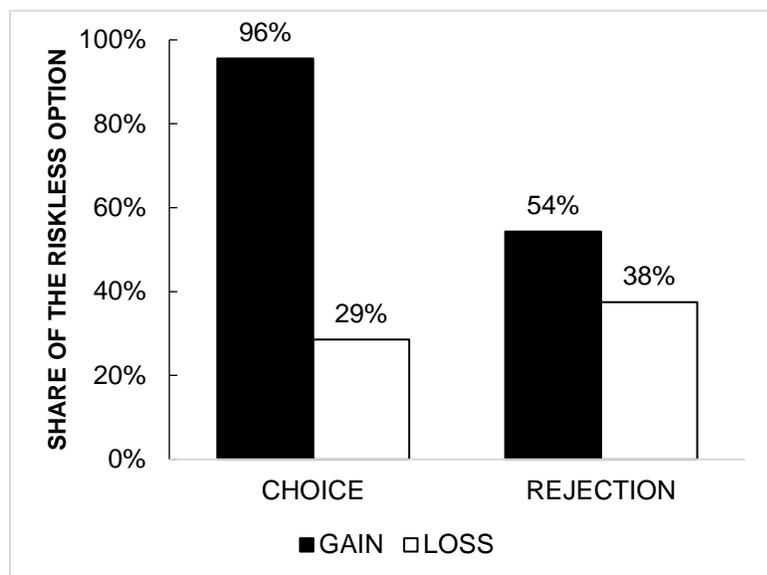
Figure 2. STUDY 1B: REJECTION TASK REDUCES FRAMING EFFECT

Figure 3. STUDY 2: SHARES OF HOTELS IN CHOICE VERSUS REJECTION
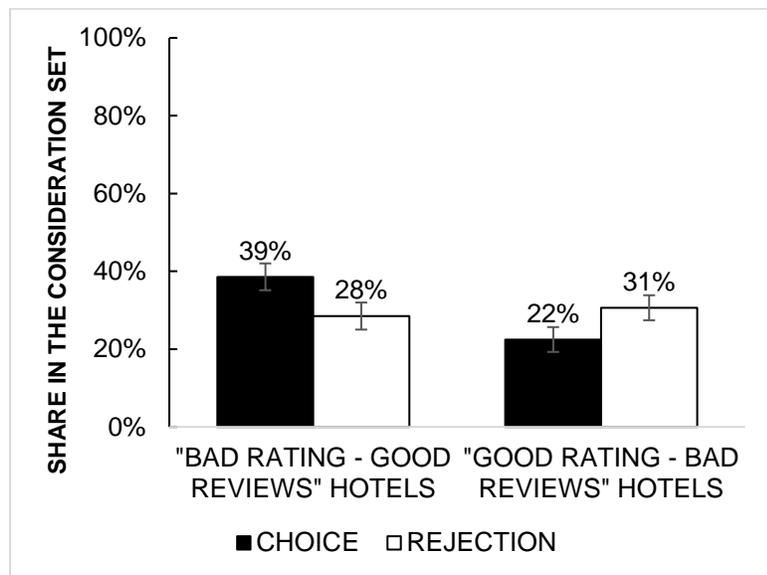
Figure 4a. MODEL 1: REJECTION DECREASES THE SHARE OF BAD RATING—GOOD
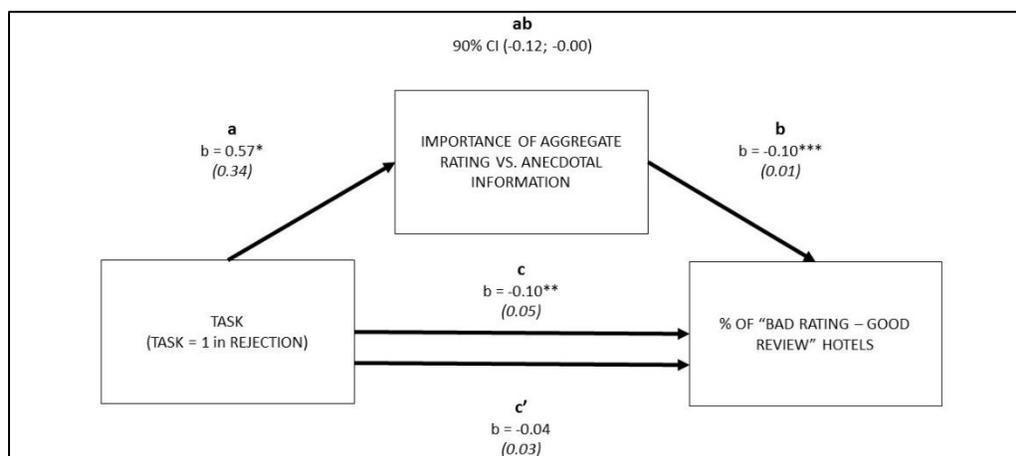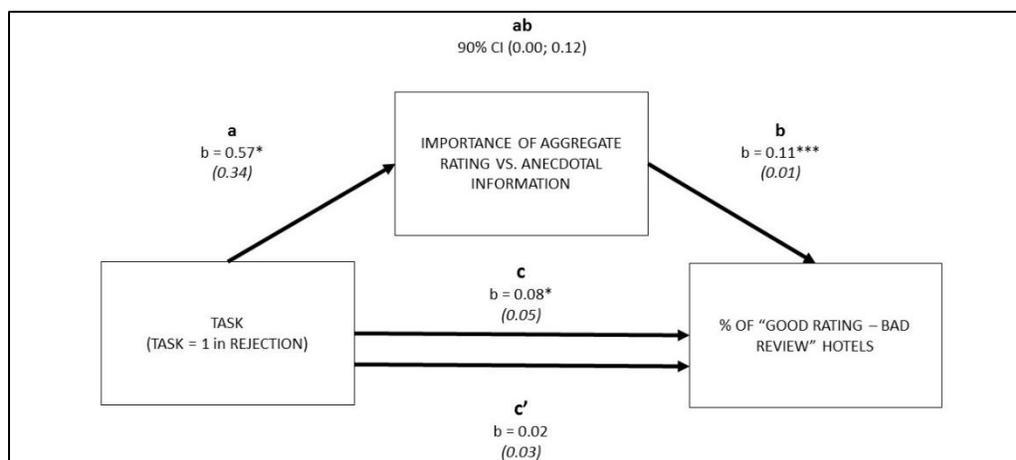
REVIEWS HOTELS

Figure 4b. MODEL 2: REJECTION INCREASES THE SHARE OF GOOD RATING—

BAD REVIEWS HOTELS

Standard errors are presented in parentheses

* effect significant at 10% level; ** significant at 5% level; *** significant at 0.1% level.

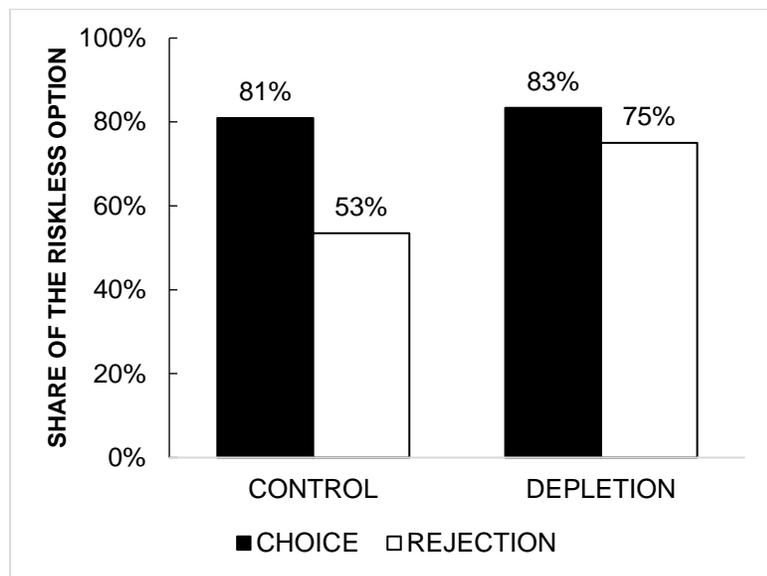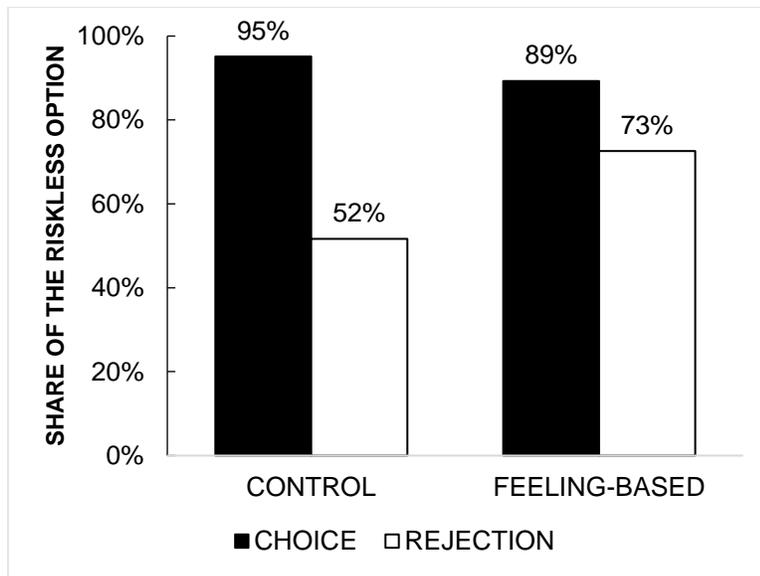Figure 5. COGNITIVE DEPLETION INCREASES RISK AVERSION IN THE REJECTION

TASK

Figure 6. FEELING-BASED PROCESSING MANIPULATION INCREASES RISK

AVERSION IN THE REJECTION TASK

Headings List

1) LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK
2) Rejection and Deliberative processing
3) *Losses, and Attention to Negative Attributes.*
3) *Negation and Deliberation.*
3) *Other Research.*
1) STUDY 1A: REJECTION AND FRAMING EFFECTS IN THE ASIAN DISEASE PROBLEM
2) Design and Procedure
2) Data and Results
2) Discussion
1) STUDY 1B: REJECTION AND FRAMING EFFECTS IN GAMBLING DECISIONS
2) Design and Procedure
2) Data and Results
3) *Response Time Data.*
2) Discussion
1) STUDY 1C: REJECTION AND FRAMING EFFECTS IN AN INCENTIVE-COMPATIBLE TASK
2) Design and Procedure
2) Data and Results
3) *Response Time Data.*
2) Discussion
1) STUDY 2: REJECTION AND THE ROLE OF AGGREGATE VS. ANECDOTAL EVIDENCE
2) Design and Procedure
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1) STUDY 3: REJECTION AND DECISION-MAKING IN A COMPLEX TASK
2) Design and Procedure
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2) Discussion
1) STUDY 4: ROLE OF COGNITIVE DEPLETION
2) Design and Procedure
2) Data and Results
3) *Response Time Data.*
2) Discussion
1) STUDY 5: ROLE OF FEELING-BASED EVALUATION
2) Design and Procedure
2) Data and Results
3) *Response Time Data.*
2) Discussion

1) GENERAL DISCUSSION

    2) Alternative Accounts

    3) *Elaboration on Preference-Inconsistent Attributes (Laran and Wilcox 2011).*

    3) *Task-compatibility Framework (Shafir 1993).*

    2) Implications for Practice

1) Appendix A. EXAMPLES OF RATINGS AND REVIEWS USED IN STUDY 2

1) Appendix B. SCREENSHOTS OF THE MAIN TASK IN STUDY 2

1) Appendix C. SCREENSHOTS OF THE MAIN TASK IN STUDY 4

1) Appendix D. STIMULI USED IN STUDY 5

1) REFERENCES

Table 1. Decision options in the four conditions of Study 1A.

Table 2. Decision options in the four conditions of Study 1B.

Table 3. Decision options in the four conditions of Study 1C.

Table 4. Penalty structure for exceeding the monthly limit in Firm A and Firm B.

Figure 1. STUDY 1A: REJECTION TASK REDUCES FRAMING EFFECT

Figure 2. STUDY 1B: REJECTION TASK REDUCES FRAMING EFFECT

Figure 3. STUDY 2: SHARES OF HOTELS IN CHOICE VERSUS REJECTION

Figure 4a. MODEL 1: REJECTION DECREASES THE SHARE OF BAD RATING—GOOD REVIEWS HOTELS

Figure 4b. MODEL 2: REJECTION INCREASES THE SHARE OF GOOD RATING—BAD REVIEWS HOTELS

Figure 5. COGNITIVE DEPLETION INCREASES RISK AVERSION IN THE REJECTION TASK

Figure 6. FEELING-BASED PROCESSING MANIPULATION INCREASES RISK AVERSION IN THE REJECTION TASK