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Decisions Following Distraction: How (Un)Conscious Processing and Decision Task Influence the Selection of Hedonic and Utilitarian Alternatives

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ABSTRACT
Prior literature indicates that hedonic alternatives are preferred under a rejection task, whereas utilitarian attributes are preferred under a choice task when a decision is simple and conscious. However, there is evidence supporting a preference for hedonic alternatives in a choice task when the decision is both complex and conscious. We propose that the extent to which a decision is preceded by conscious or unconscious information processing may alter the preference for utilitarian versus hedonic options in a choice or rejection task as a function of the complexity of the information being processed. Our findings indicate important qualitative departures from the extant literature when complex decisions are preceded by unconscious processing as a function of the decision task at hand. In the context of complex decisions, we find a preference for utilitarian alternatives in choice tasks and a preference for hedonic alternatives in rejection tasks, but only when information is processed unconsciously.

Keywords: decision task, choice and rejection, hedonic, utilitarian, unconscious, conscious

INTRODUCTION:

Jeanne accepted a new job and is now searching for an apartment to rent. She would love to live near her work in a building in a central location with a park view. That way she could save time and money on transportation while also being able to experience the restaurants, art scene, and relaxing view the location offers. She learns that to achieve her utilitarian ideal (e.g., saving time and money), she would have to lower her ideal hedonic expectations (the view and what the city has to offer) and vice-versa. As she evaluates apartment options, she wonders if she should focus on choosing an option or rejecting multiple options until only one option is left to be selected. She also ponders whether she should create a spreadsheet to rate and thoroughly compare each apartment's attributes or just go out and have a relaxing dinner to take her mind off the options hoping that the right decision will come to her.

Consumers often face decisions that involve trade-offs between utilitarian and hedonic alternatives. The use of different decision approaches, choice or rejection, has often led to different outcomes concerning the selection of hedonic versus utilitarian alternatives (e.g., Dhar and Wertenbroch, 2000; Laran and Wilcox, 2011; Nagpal et al, 2015; Hossian and Saini, 2015; Chan, 2015; Sokolova and Krishna, 2016; Huang et al, 2018). Prior research indicates that consumers prefer utilitarian alternatives in choice tasks, whereas, in rejection tasks, consumers prefer hedonic alternatives (Meloy and Russo, 2004; Shafir, 1993). The number of attributes taken into consideration in this type of decision has also been shown to have implications for consumer decision-making with consumers sometimes favoring hedonic options in choice tasks when the number of attributes being considered is large (Sela and Berger, 2012). The bulk of the research in this area, however, has not considered whether deliberative thinking or unconscious processing could influence the selection of hedonic and utilitarian options as a function of the decision approach used. In line with the suggestion by Sokolova and Krishna (2016), who identified a relationship between deliberative thinking and rejection tasks and pointed out the need for a better understanding of the role of unconscious processing in decision tasks, we aim to contribute to this literature by incorporating a stream of research that focuses on the role of unconscious processing in choice and rejection decision tasks involving utilitarian and hedonic alternatives (Sokolova and Krishna, 2016).

Although consumer research suggests that distractions during complex decisions might not be beneficial to decision-makers (Chaiken, 1980; Petty et al, 1983), recent research in psychology indicates that, when facing complex decisions, distracted individuals – those who allow their brains to work on a decision unconsciously – might make superior decisions (Dijksterhuis, 2004; Dijksterhuis and Nordgren, 2006; Lerouge, 2009; Dijksterhuis and Strick, 2016; Abadie and Waroquier, 2019). This research ultimately suggests that, for complex decisions, individuals would benefit from a period of distraction, as opposed to conscious deliberation, an account that has been labeled Unconscious Thought Theory (UTT; Dijksterhuis, 2004; Dijksterhuis et al., 2006; Dijksterhuis and Nordgren 2006). This is expected because the distraction causes the information to be processed by the unconscious cognitive system, which is predicted to be a more powerful information-processing system than the conscious, short-memory based, system. According to this account, while the working memory focuses on more

practical tasks and objectives, the unconscious processes the information with greater depth (Dijksterhuis et al., 2006; Dijksterhuis and Nordgren, 2006; Dijksterhuis and Strick, 2016). According to this view, if the apartments-selection task is complex (e.g., many apartments and or/many attributes), Jeanne would be better off if she enjoyed a relaxing dinner to take her mind off the options hoping that the right decision would come to her.

In this research, we make the case that complex decision tasks involving utilitarian and hedonic alternatives, such as the one in the opening apartment scenario, are not only likely to be influenced by the decision task (choice vs. rejection) but also by whether the information is processed consciously or unconsciously. We add to the decision-task literature by showing that, in complex decisions, choice tasks lead to a preference for utilitarian alternatives. In contrast, rejection tasks lead to a preference for hedonic alternatives when the information available for the decision is processed unconsciously but not when it is processed consciously. This occurs because UTT suggests that unconscious processing leads to a deeper processing of complex information allowing for a more proper attribute-weight assignment (Dijksterhuis and Strick, 2016). This attribute-weight assignment could decrease one’s susceptibility to heuristic processing, such as when numerosity heuristic biases lead to an individual’s preference for hedonic over utilitarian options because hedonic options are easier to justify, as Sela, Berger, and Liu (2009) found.

We provide support for the role of unconscious processing in the domain of decision-task and selection of hedonic versus utilitarian alternatives in four studies that show that processing mode (unconscious vs. conscious), decision task (choice vs. rejection) influence the selection of hedonic and utilitarian alternatives in complex decisions. The first study tested the key

hypothesis in a food-selection context with implications for one’s own utility, where participants received a snack from their selected snack pack at the end of the study. The second study examined the role of cognitive load in unconscious processing and ruled out conscious processing as an alternative explanation for the results of experiment 1. The third study examined the role of cognitive fatigue on unconscious processing and further provided evidence for the unconscious processing account. The fourth study showed that the level of task complexity moderates the results found in the previous studies. A random-effect meta-analysis of the results under unconscious processing across the four studies supports the robustness of our findings.

Theoretical Background and Conceptual Framework

Decision Tasks

Individuals may use two basic general approaches when making a decision: choice or rejection. Choice tasks involve selecting an option from multiple alternatives whereas rejection tasks involve giving up alternatives until only one is left. These two types of decision tasks often lead to distinct patterns of decision outcomes (Shafir, 1993). For example, in the context of consideration-set size, Huber, Neale, and Northcraft (1987) found that people include fewer options in the consideration set in choice tasks than in rejection tasks. Shafir (1993) has shown that when people use a choice approach, they tend to focus on the positive attributes, whereas people using a rejection approach tend to focus on negative attributes (see also the compatibility effect; Meloy and Russo, 2004). Other related work has found that using a rejection strategy

leads to further elaboration on product attributes that are not considered as important given the current active goal, otherwise called “preference-inconsistent attributes” (Laran and Wilcox, 2011: 230) and that rejection tasks increase deliberative processing (Sokolova and Krishna, 2016).

Decision Tasks and Preference for Hedonic versus Utilitarian Alternatives

Researchers studying choice and rejection decision tasks have also examined the role of such decision approaches concerning preference for hedonic and utilitarian attributes. Their findings indicate that, in choice tasks, individuals tend to focus on utilitarian attributes (Shafir et al., 1993; Dhar and Wertenbroch, 2000) whereas, in rejection tasks, individuals tend to place greater emphasis on hedonic attributes (Meloy and Russo, 2004; Shafir, 1993). The underlying argument for these findings is that in a choice task, utilitarian attributes offer more compelling reasons to justify the choice (Dhar and Wertenbroch, 2000). These authors also found that the use of a rejection strategy leads to greater spontaneous elaboration, especially for more imaginable features. Since hedonic attributes tend to be more sensory and imagery-evoking (MacInnis and Price, 1987), this increased elaboration favors hedonic attributes, leading to a preference for hedonic alternatives.

In contrast to the finding that people prefer a utilitarian (or virtuous) option when using a choice strategy, Krishnamurthy and Prokopec (2010) found that rejection decisions can lead to more virtuous behavior when people have mental budgets for indulgent decisions (e.g., the consumption of a certain amount of dessert) because in rejection tasks people elaborate on reasons to avoid a certain option. Laran and Wilcox (2011) explored these conflicting findings concerning the relationship between choice/rejection tasks and indulgent behavior and found that

preference for indulgent options during a rejection decision “depends on whether consumers have a baseline preference for exerting self-control or indulging” (Laran and Wilcox, 2011: 239). Put simply, choice tasks encourage elaboration on information consistent with the consumer’s preferences, whereas rejection tasks encourage elaboration on information inconsistent with the consumer’s preferences. Thus, although results tend to support the selection of utilitarian options in choice tasks and hedonic options in rejection tasks, there is also evidence suggesting that this pattern of results can be moderated.

Relevant to this research is the impact of decision tasks on the selection of hedonic versus utilitarian alternatives and how they play out in complex tasks in which the number of pieces of information considered in the decision increases. Sela, Berger, and Liu (2009) propose that, in the domain of more complex decisions, the use of a choice strategy when selecting from larger assortments can lead to an increase in preference for hedonic options, a finding that is inconsistent with the finding that utilitarian alternatives are often selected in choice tasks (Dhar and Wertenbroch, 2000). In a follow-up study, Sela and Berger (2012) demonstrated that attribute quantity, which increases the complexity of a decision, asymmetrically benefits hedonic over utilitarian options by increasing the extent to which the former type of attribute appears to be more beneficial for a decision as a result of an attribute-numerosity bias. They observe that by evenly adding hedonic and utilitarian attributes to the choice set, a shift in preference towards hedonic options occurs, regardless of whether the attributes are hedonic, utilitarian, or mixed in nature. These effects were magnified when individuals engaged in heuristic processing. Also relevant to our research is that the findings reported above are based on tasks where the

individuals deliberately process the information, whereas we focus on the role of unconscious process in such decision tasks.

Decision Tasks and Task Complexity

Prior literature has also examined the relationship between decision tasks and task complexity (Chernev et al., 2015; Scheibehenne et al., 2010; Strick et al., 2011). However, few have examined the relationship between rejection strategies and task complexity. Prior literature indicates that rejection tasks are complex, deliberative, thought-oriented, and resource-consuming (Heller et al., 2002; Sokolova and Krishna, 2016), implying conscious deliberation during information processing. The extant literature has shown that increasing attribute quantity increases choice difficulty (Lurie, 2004), and decreased satisfaction (Messner and Wänke, 2011), which leads people to “give up” and select an emotionally gratifying hedonic option. Yet, this account is inconsistent with research suggesting that choice difficulty leads consumers to prefer hedonic options to utilitarian ones because the former is easier to justify (Sela et al., 2009). This evidence reveals that the processing capacity of consciousness is limited, which leads us to infer that such a low processing capacity might not be sufficient for complex decisions as predicted by Dijksterhuis (2004), and may lead to heuristic processing and biases Sela and Berger (2012) predicted when people choose between complex utilitarian and hedonic options.

Unconscious Processing of Complex Information

A growing body of literature supports the idea that individuals facing a greater level of complexity in decision-making might benefit from a period of distraction (i.e., unconscious processing), as opposed to conscious deliberation (Wilson and Schooler, 1991) and such unconscious processing of information has been proposed to lead to superior choices under

deliberation-without-attention (i.e., unconscious deliberation; Dijksterhuis, 2004; Dijksterhuis and Nordgren, 2006). According to this account, this distraction mechanism results in the unconscious processing of information in more complex decisions, while the working memory, which relies on conscious processing, focuses on unrelated tasks that distract individuals from the focal decision. UTT suggests that while the working memory focuses on these distracting tasks at hand, the unconscious continues to process complex information to which an individual was exposed as part of their process of evaluating alternatives (Dijksterhuis et al., 2006; Dijksterhuis and Nordgren, 2006). According to UTT, conscious processing is predicted to be more effective when considering alternatives that only vary in a small number of attributes (e.g., two or three attributes) that can benefit from working-memory processing. In other words, simpler, more straightforward decision tasks benefit from conscious processing because attention is focused on the task itself, and the problem must be fully weighed before making a final decision (Bargh, 2011).

Alternatively, unconscious thought is defined as a process that occurs outside of consciousness (Dijksterhuis and Nordgren, 2006). UTT argues that, for complex tasks, an individual’s unconscious processing leads to better decisions than conscious thought does because the unconscious can better organize information by increasing the likelihood that attention is distributed across a broader array of features (Bargh, 2011). Of particular interest is the finding that the representation of characteristics tends to be polarized under unconscious thought. Dijksterhuis (2004, experiment 4) found that the positive (negative) characteristics of a desirable (undesirable) roommate were much more accessible than the negative (positive) characteristics of a desirable (undesirable) roommate when information is processed under unconscious thought. This greater accessibility of the characteristics of the roommate allows one

to make superior decisions as the similarities and differences among options become more salient. Similarly, Bos, Dijksterhuis, and van Baaren (2011) reported that unconscious thinking increases the memory for attributes that are more relevant, effective, and important at the time of decision than for unimportant attributes. Complex decision-making relies critically on memory (Abadie and Waroquier, 2020). These results provide a basis to predict that, under complex decisions, the weight of utilitarian and hedonic attributes can be more appropriately assigned when information is processed unconsciously.

Although one could challenge whether truly unconscious processing occurs as predicted by UTT, as evidence for such a type of processing might not be easily attainable, it is not our goal to prove the claims of unconscious thought by UTT. Our goal is to demonstrate, in line with UTT’s predictions, that when the information about the complex decision at hand is not at the forefront of one’s conscious thought, as it happens when one is engaged in a distraction task, information is processed differently from when information is at the forefront of the decision process. With respect to unconscious versus conscious processing, we side with Carlson, Tanner, Meloy, and Russo (2014), who state that conscious versus unconscious processing is a continuum rather than a binary system. Thus, we predict that distraction tasks, such as those used in UTT, might engage some level of non-attentive processing rather than having the information fully processed unconsciously. For simplicity, however, we will refer to these varying degrees of processing as conscious and unconscious when describing experimental conditions.

Summary and Predictions

Among one of the most puzzling contrasts in the literature described above it is the contrast between the findings from Dhar and Wertenbroch (2000), showing that people prefer

utilitarian options in a choice task (hedonic options in a rejection task) and those found by Sela and Berger (2012) who found a preference for hedonic options in a choice task. One key difference between these two findings is the complexity of the decision as a function of the number of pieces of information processed. The greater complexity of the stimuli in Sela and Berger (2012) may have overloaded the working memory, hindering processing, which may have led individuals to rely on heuristic processing of a more complex set of stimuli, favoring hedonic attributes. Recall that UTT predicts that, under unconscious processing, one can more thoroughly process complex information, decreasing the likelihood of relying on heuristic processing. If the preference for hedonic alternatives in a complex choice task is driven by heuristic processing, perhaps one can expect a preference for utilitarian alternatives in a choice task if the unconscious can more thoroughly process complex information and focus on attributes that help to rationally justify the choice. This result would align with what Dhar and Wertenbroch (2000) originally found in simpler decision tasks. For rejection tasks, greater processing ability should not hinder one's ability to elaborate, which would favor more imagery-type attributes such as hedonic attributes. These predictions would bridge the gap between these two sets of results through the lenses of the type of information processing one uses (conscious vs. unconscious) as a function of complexity. It would also allow one to predict under which processing conditions one should expect choice and rejection tasks to lead to preferences for utilitarian or hedonic options as a function of the complexity of the task.

Therefore, we hypothesize:

H1: when making a complex decision using unconscious processing, a choice task will lead to a preference for utilitarian alternative, and

H2: when making a complex decision using unconscious processing, a rejection task will lead to a preference for hedonic alternatives.

Studies Overview

We tested these predictions in four studies. In study 1, we demonstrate that the impact of distracting one from the target complex decision holds in contexts with true consequences for one's own utility in terms of the selection of utilitarian and hedonic options in a realistic setting with actual food choice consequences. In study 2, we rule out the possibility of conscious processing of information during a distraction task by limiting conscious processing via a cognitive load manipulation and providing process evidence supporting unconscious processing. In study 3, we use a cognitive fatigue manipulation that is predicted to impair both conscious and unconscious processing to provide further evidence that unconscious processing is the key driver of the predicted effect while identifying a novel boundary condition for the phenomenon studied. In study 4, we investigate our predictions under both simple and complex decisions. Finally, a random-effects meta-analysis supports the robustness of our findings.

Study 1

Study 1 was designed to test the main hypothesis that unconscious processing of a complex decision will lead to a preference for utilitarian alternatives in a choice condition and for hedonic alternatives in a rejection condition. Study 1 employs the unconscious and complex decision conditions in an actual choice context with implications for one's own utility.

Specifically, we tested how (un)conscious processing of hedonic and utilitarian snacks affects product selection depending on whether one undergoes a choice or rejection task. We used a modified version of the scenario employed by Withrow and Thorsteinson (2009) in a complex

set of information in which participants had to choose (reject) among four snack pack options with different levels of healthy (utilitarian) and unhealthy (hedonic) snacks.

Design and Participants

Participants were three hundred and forty students recruited from a major university. Participants who indicated to have previously participated in a similar (pretest) study were excluded from the final sample leaving two hundred twenty-two students (M_{age} = 20; SD_{age} = 1.92). The design was a 2 (processing mode: conscious vs. unconscious) x 2 (decision task: choice vs. rejection) between-subjects design. Participants were randomly assigned to the experimental conditions. Participants snack selection at the end of the study, either healthy or unhealthy, was the binary dependent variable.

Procedure and Stimuli

We pretested a sample of 22 snacks to determine their perceived level of healthiness using a sample from the same population as the main study. We asked participants to rate how healthy they found each snack on a scale from 1 (least healthy) to 7 (most healthy). We made the decision complex by using a set of 16 snacks that were selected based on the average perceived healthiness score from the pretest. We acknowledge that complexity can be operationalized in multiple ways, such as the number of options or the number of attributes with important qualitative distinctions in terms of their outcome for the selection of hedonic versus utilitarian alternatives. Notably, Sela, Berger, and Liu (2009) found that complexity resulting from large sets of items leads to choices of indulgent/hedonic options when such choices are easier to justify. Alternatively, Sela and Berger (2012) showed that complexity stemming from the number of attributes of a product also leads to a preference for hedonic options. From our theorizing, we take an agnostic approach to whether these distinct operationalizations of complexity have a meaningful impact on our predictions, as UTT mostly focuses on the complexity of a decision from an attributes standpoint. To that end, we test our predictions using both types of complexity (number of options in experiment 1 and number of attributes in the remaining studies).

Main Study

The eight snacks rated most healthy and the eight snacks rated least healthy were selected to form, in various combinations, the four snack packs (see web-appendix A) to be presented prior to the type of snack decision. Each snack pack contained eight snacks. Participants were told that they would be asked to form a general impression of four different snack packs with eight different snacks each (generically labeled packages A-D). The target snack packs contained either all healthy (i.e., utilitarian) or all unhealthy (i.e., hedonic) snacks. The remaining two packs featured four healthy and four unhealthy snacks. The former two snack packs were the target stimuli, and the latter two packs were fillers used to increase the amount of information and complexity of the task.

The target healthy snack pack included: almonds, a banana, an apple, cashews, a pear, a granola bar, strawberries, and grapes. The target unhealthy snack pack included: a chocolate bar, a cookie, a croissant, a cupcake, a Danish, fries, fudge, and a muffin. The order of presentation of the packs on the screen was randomized, and so were the snacks in each of the packs. Each snack in the pack was presented, one at a time, for four seconds on the computer screen. Participants were asked to form an opinion about the four different snack packs with eight snacks in each.

After the snack information presentation, participants were exposed to the processing-mode manipulation. All participants were told they would later be asked their opinion of the snack packs. In the conscious-processing condition, participants were asked to write about each of the snack packs and told that they had four minutes to complete this task. Participants were instructed to write at least one hundred characters. In the unconscious-processing condition, participants were told they would have four minutes to complete an ostensible memory task (i.e., the word puzzle, see Appendix B). This task consisted of a word-search puzzle in an array of 10 x 10 letters adapted from Nieuwenstein et al. (2015), and participants were tasked with finding five of each type of target words. The words were the names of five different countries (Germany, France, Japan, Canada, Italy), five vegetables (lettuce, potato, carrot, onion, tomato), and five fruits (orange, lemon, melon, grape, apple). Participants were told the words could be laid out in any direction (horizontal, vertical, and diagonal). In both conditions, a timer was shown with the elapsed time.

Upon completing the ostensible memory task, participants were exposed to the decision-task manipulation. First, we informed all participants that they would receive one of the snacks from the snack pack they selected but that the filler snack packs were unavailable. In the choice condition, we asked participants to choose one snack pack from which they would like to receive a snack after completing the study. In the rejection condition, we asked participants to reject the snack pack from which they would not wish to receive a snack at the completion of the study.

The snack a participant selected to take upon completion of the experiment was the dependent variable.

Following the selection of a snack pack, we requested that participants indicate how difficult the task was on an 11-point scale anchored on “0 – not difficult at all” on the left and “10 – very difficult” on the right, as a manipulation check for complexity. We then asked participants to select the experiment condition to which they were assigned as an attention check. The options were “Choose a snack” or “Reject a snack.” Again, participants completed demographic information and were debriefed, thanked for their participation, and asked to pick up the snack from the package that they selected. The snacks available to the participants were a granola bar for the healthy/utilitarian snack package and a chocolate bar for the unhealthy/hedonic snack package. They were labeled as either “Package A” or “Package B” and presented next to each other near the exit of the lab (see web -appendix C for image).

Results

Task Difficulty

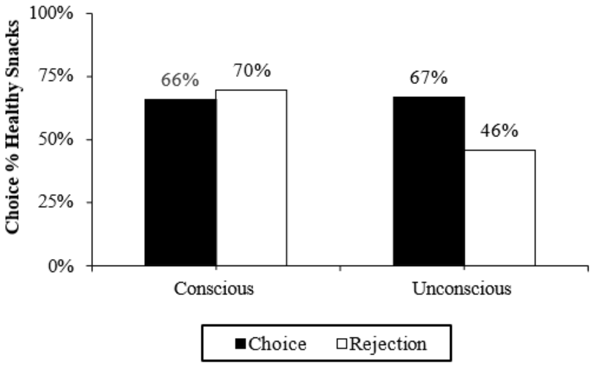
Our manipulation of task difficulty of snack pack selection was successful. Overall, participants reported the task of evaluating the snack pack to be difficult (M= 5.85, SD = 2.43) as compared to the midpoint of the scale, t (221) = 5.22, p < .005).

An ANOVA on the perceived difficulty of the task showed that this perception did not vary as a function of decision task (F(1,218) = .001, p = NS), processing mode (F(1,218) = .16, p =NS), or their interaction (F(1,218) = .28, p = NS).

Decision Task

The dependent measure was coded a 0 when the selection was a healthy (utilitarian) snack pack and 1 when it was an indulgent (hedonic) snack pack. A logistic on this measure revealed a marginally significant interaction between the processing mode and decision strategy factors (Wald χ^2 (1) = 3.59, p = .06, figure 1). To explore the nature of the interaction, we compared whether there were significant differences across the processing modes in both the rejection and choice-decision-strategy conditions.

Fig. #1. Choice Proportion for Healthy Snacks.



In the unconscious-processing condition, there was a significant difference between rejection and choice decision on snack selection with a greater proportion of participants choosing the healthier snack pack in the choice than in the rejection condition (P_{choice} = 67%, *SD* = .47; $P_{rejection}$ = 46%, *SD* = .50, Wald χ^2 (1) = 4.93, $p < .05$). However, in the conscious-processing condition there was not a significant difference between rejection and choice on snack selection (P_{choice} = 66%, *SD* = .48; $P_{rejection}$ = 70%, *SD* = .46, Wald χ^2 (1) = 0.76, $p > .50$).

Discussion

The findings of this study confirm the key hypothesis put forward for a decision with actual behavioral consequences. Preference for more indulgent options varied in line with our predictions in the unconscious condition, with a greater preference for a healthy snack when the task at hand was rejecting a snack pack rather than when it was choosing a snack pack.

Study 2

The mechanism underlying UTT is based on the idea that a more powerful unconscious system processes complex information. It is possible that the distraction task in Study 1 still allowed for the conscious processing of the food items during the distraction task even if participants were not explicitly asked to deliberate on the snack options. To attenuate this concern, in study 2, we added a cognitive-load task to both test the underlying mechanism and rule out the potential concern related to the distraction task not preventing deliberative thinking about the snack options. This study uses an apartment lease context with varying apartment attributes and attribute valences. We believe that the loading of the cognitive system should limit the ability of the short-term memory to process the information about apartment attributes because it should limit the number of elements that can be processed. If our theorizing is correct, and information is processed within the unconscious system when participants engage in a distraction task, a cognitive load manipulation should not affect the basic finding of study 1 in the complex and unconscious conditions. In other words, since unconscious processing does not use resources from the working memory to process information, the results should replicate those in the unconscious-processing condition in Study 1.

Design and participants

Two hundred and seven participants were recruited from MTurk and were randomly assigned to the conditions resulting from a 2 (cognitive load: low vs. high) x 2 (decision task: choice vs. rejection) between-subjects full factorial design. One participant failed the attention check (same check as in study 1), and ten others failed the cognitive-load task by failing to recall the correct number of recall elements of the task and were all excluded from the final sample.

The final sample included one hundred and ninety-six participants (120 women; M_{age} = 38.82;

SD_{age} = 13.06).

Procedure and Stimuli

Participants were told they would examine with four different apartments featuring a variety of attributes and asked to form a general impression about the four apartments that were available for lease (see the experiment flow in web-appendix D). Each apartment featured three hedonic and three utilitarian attributes of varying valences for six attributes. The hedonic attributes were *landscaping* (pleasant vs. unpleasant), *view* (park vs. parking lot), and *landlord* (kind vs. unkind). The utilitarian attributes were *monthly rent* (relatively expensive vs. relatively cheap), *distance to work or school* (relatively close vs. relatively far), and *network signal* (poor vs. strong). To illustrate, apartment B featured three positively-valenced hedonic attributes and three negatively-valenced utilitarian attributes. These attributes were: pleasant, park, kind, relatively expensive, relatively far, and poor. Apartment D had three negatively-valenced hedonic attributes and three positively-valenced utilitarian attributes. These attributes were attribute valences in the complex condition were: unpleasant, parking lot, unkind, relatively cheap, relatively close, and strong. Thus, apartment B is the hedonic-dominating alternative, whereas apartment D is the utilitarian-dominating alternative. Two apartments (A and C) were used as fillers to increase the amount of information processed. These apartments had mixed dominating valences for utilitarian and hedonic attributes, and, at the time of the apartment selection, participants were told these filler apartments were no longer available for lease. The complete set of apartments/attributes is available in web-appendix E.

Participants were randomly assigned to one of the four experimental conditions resulting from crossing the cognitive load and decision-task factors. The order of presentation of the four

apartments was randomized. For each of the four apartments, attributes were displayed on the screen one at a time in random order for four seconds each. After that, participants participated in the cognitive-load manipulation. Cognitive load was manipulated by using four-by-four matrices with four dots presented within 16 possible locations (adapted from Heyman et al., (2015)). The high-cognitive-load manipulation consisted of a dispersed distribution of the four dots, whereas the low-cognitive-load manipulation consisted of the four dots in a single line. Participants were informed that, after performing a series of judgment and decision tasks, they would be asked to reproduce the location of the dots in the matrix, which was shown to them for four seconds.

Participants were then told they would participate in a four-minute cognitive task (the same distraction (word-search puzzle) versus deliberation (about the apartments in experiment 2) task used in experiment 1).

Following this task, we asked participants to select one of the apartments either through a choice or rejection task. In the choice-task condition, participants were told that their task was to choose one of the two apartments. In the rejection-decision-task condition, participants were asked to reject one of the apartments, in which case they would select the one that was not rejected. We use both a judgment and a choice task for the dependent measure. They first rated their choice or rejection likelihood using a 7-point trade-off scale ranging from -3 definitely (accept/reject) apartment B to +3 definitely (accept/reject) apartment D. Following this rating, participants were also asked to select their option using a binary decision task (rather than rating their likelihood to accept/reject). We examined both measures as the dependent measures of the experiment. After the choice/rejection tasks, participants were asked to reproduce the initial dot pattern they saw during the cognitive load manipulation in a blank matrix as a check for the

cognitive-load manipulation. There was no time limit for participants to reproduce the pattern of dots.

As an attention check, following the suggestion of Oppenheimer et al. (2009), we checked whether participants were reading instructions attentively by asking “When you are choosing an apartment to rent, what are the attributes that most attract your attention? Actually, we would like to know if you are reading all the instructions given and paying enough attention. So, please, select the ‘other’ option and write-in ‘apartment.’” Seven options were presented (price, place, view, security, distance, utilities) in addition to the option “other”. At the end of the experiment, participants answered questions about demographic variables and were debriefed, thanked for their participation, and given a code to redeem for compensation through Amazon’s MTurk.

Results Manipulation checks

An ANOVA on the number of dots correctly placed on the grid showed that the average number of correctly localized dots in the low-cognitive-load condition was statistically significantly higher than that in the high-cognitive-load condition (M_{low} = 3.95 and M_{high} = 2.93, $F(1, 192) = 59.65$, $p < .001$, *Cohen’s d* = 2.37), confirming that the cognitive-load manipulation worked as intended. No other main effect or the interaction was statistically significant.

Apartment Selection Likelihood

An ANOVA on the apartment selection ratings rendered a non-statistically significant interaction between the decision strategy and cognitive load factors ($F(1,192) < 1.0$, $p = NS$). The main effect of cognitive load was also not statistically significant ($F(1,192) < 1.00$, $p = NS$). The analysis did reveal a statistically significant effect of the decision task ($F(1,192) = 6.61$, $p = .01$,

Cohen’s d = .37). In the choice-task condition, there was a preference for the apartment that dominated in terms of utilitarian attributes over the apartment that dominated in terms of hedonic attributes (M_{choice} = .40, SD = 1.85) whereas the opposite was true in the rejection-task condition ($M_{rejection}$ = -.36, SD = 2.34).

Binary Decision Task

The binary selection of an apartment was coded as 1 when the selection was the utilitarian apartment and 0 when the selection was the hedonic apartment. A logistic regression on the binary selection of apartment did not reveal a significant interaction between the cognitive-load and decision-task factors, (Wald χ^2 (1) = .43, $p < .50.$), nor did it reveal a main

effect of the cognitive load factor (Wald χ^2 (1) = .15, $p >$ 65.). In line with the results reported above, a larger proportion of participants selected the utilitarian alternative in the choice condition (M = 57%, SD = .50) than in the rejection condition (M = 36%, SD = .49; Wald χ^2 (1)

= 5.47, $p = .02$).

Discussion

The results of study 2 replicated those of study 1 under unconscious conditions and did not vary as a function of cognitive load. Study 2 shows that even when individuals perform a cognitive-load task that limits their short-term memory capacity, a distraction task affects their decision in line with our predictions. If the findings in the unconscious-process condition were a result of conscious thinking at the time of judgment, then a different pattern of results should have arisen in the high-cognitive-load condition.

Study 3

Study 3 was designed to further test the process underlying the key phenomenon we investigate. In study 2, we provided evidence that limiting the availability of short-term memory cognitive resources does not affect the ability of the unconscious system to process complex information. It follows that if one can diminish the ability of the unconscious system to process complex information, the effect observed in study 2 should be moderated by reducing the magnitude of the difference in preference for utilitarian versus hedonic options. To that end, in study 3, we used a cognitive-fatigue manipulation. A cognitive-fatigue effect occurs when individuals’ feelings of effortful exertion, which lead to a growing feeling of mental tiredness that dampens motivation and/or increases the need to reduce effort or disengage from the task entirely (Hockey, 2013). Relevant to this research’s goal is that when cognitive fatigue sets in, it depletes one's cognitive resources, and both conscious and unconscious judgment become impaired (Baumeister, 2014). In that case, the effect we found following a distraction task in the previous experiments might not be observed under mental tiredness as a result of the potential impairment of the unconscious system stemming from cognitive fatigue. Also, given that our predictions rely on people being aware of the type of decision task with which they have been assigned, in Study 3, we asked participants to indicate whether they were instructed to choose or reject an apartment following the dependent measure as a way to control for inattentive respondents.

Design and Participants

Three hundred thirty-seven participants, recruited from MTurk workers, were randomly assigned to the conditions resulting from a 2 (distraction task: cognitive fatigue vs. control) x 2 (decision task: choice vs. rejection) between-subjects design (57% women; M_{age} = 37.90; SD_{age} = 12.15). The design replicated that of study 2, with the cognitive fatigue factor replacing the cognitive-load factor.

Procedure and Stimuli

Participants were informed that they would perform two unrelated tasks. In the first task, they were asked to form an overall impression of four apartments featuring different attributes as in the previous study. In the second task, they were tasked with completing a word-search puzzle that was ostensibly an attention check.

After reviewing the information about the four different apartments, participants received a word-search puzzle. In both conditions, after the word-search puzzle instructions, they read the following information, "Your attention check will be based on whether you finished solving the word-search puzzle correctly. If you decide to quit, click on proceed when the button becomes available." The button became available two minutes after the beginning of the puzzle.

At the beginning of the study, participants were told that their data would be deemed invalid if they failed the attention check, and payment would be withheld. In the cognitive-fatigue condition, participants received an unsolvable word-search puzzle which was used to trigger a state of cognitive fatigue. A similar puzzle was presented in the control condition, but the puzzle was solvable. Individuals had to find all the words to complete the task. There was no time limit to perform the word-search puzzle task.

Following the measurement of the dependent measures, which were the same as those in Study 2, we asked participants to indicate how they felt about the task, using five 7-point scales (easy/hard; enjoyable/boredom; pleasant/unpleasant; enthusiasm/frustration; fun/hard-work), as a way to measure the impact of cognitive fatigue on one's ability to process information. We also asked them to answer the following questions as a cognitive-fatigue manipulation check "I had to exert control over myself during the task"; and "I strongly had to control myself to inhibit a certain inclination." These items were measured on an 11-point scale (from 0 – "not much" to 10 – "very much") based on Baumeister et al.'s scale (1998).

Participants were then asked to recall the apartment attributes, respond to the main apartment question, and perform the same attention check used in Study 2 in addition to some questions about demographics. We then asked participants to select the condition that they saw at the decision task as an attention check. The options were "Choose an apartment" or "Reject an apartment." Participants who did not select the option that corresponded to the condition to which they were assigned were removed from the sample (although the results are robust to the inclusion of these participants in the analysis), in line with the suggestions by Meyvis and Van Osselaer (2018) as a way to increase power by increasing the effect size.

At the end of the experiment, participants were debriefed and told that their payment was not going to be withheld, as the puzzle was purposely unsolvable. They were then thanked for their participation and given a code to redeem compensation through Amazon's Mechanical Turk.

Results Distraction Task

The five items used to measure how participants felt about the task were loaded on a single factor in a factor analysis and were averaged to create a composite feeling task index (Cronbach's □ = .91). Participants in the cognitive-fatigue condition (M = 3.77; SD = 1.52) felt statistically significantly less positive (e.g., bored/frustrated) with the task than their counterparts in the control condition (M = 2.76; SD = 1.39; $t(335) = 6.32$, $p < .001$, *Cohen's d* = .69).

Participants in the cognitive-fatigue condition spent more time to solve the word-search puzzle (M = 411.99 seconds, SD = 221.83) than those in the control condition (M = 301.75 seconds, SD = 242.77; $t(335) = 4.35$, $p < .001$, *Cohen's d* = .47). The two items used to measure cognitive fatigue were also loaded on a single factor and averaged to create a cognitive-fatigue composite measure (Cronbach's α = .75). An ANOVA on this composite measure yielded a significant main effect of the distraction task factor ($F(1,333) = 129.26$, $p < .001$, *Cohen's d* = .71).

Participants in the cognitive-fatigue condition were statistically significantly more depleted ($M_{cognitive\_fatigue}$ = 4.85; SD = 2.78) than those in the control condition ($M_{control}$ = 2.93; SD = 2.43). No other main effect or the interaction was statistically significant.

Recall of Attributes

As a control for the impact of cognitive fatigue on memory, we asked participants to recall the attributes from the apartments. The analysis revealed no statistically significant distraction task main effect ($F(1,333) < 1.0$, p = *NS.*), no decision strategy main effect ($F(1,333)$

< 1.0, $p =$ *NS*) and no interaction ($F(1,333) < 1.0$, $p = NS$).

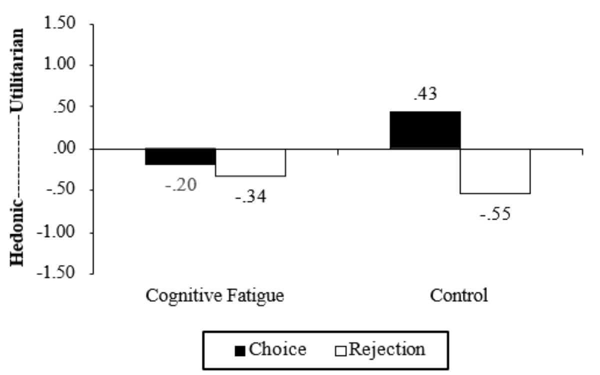
Apartment Selection Likelihood

An ANOVA on the likelihood of choosing/rejecting apartments revealed a statistically significant interaction between the distraction task and decision-task factors ($F(1,333) = 3.85$, $p = .05$, *Cohen's d* = .11, see figure 2). In the control condition, there was a statistically significant simple main effect of the decision-task factor ($F(1,333) = 10.31$, $p < .001$, *Cohen's d* = .51).

There was a preference for apartment D (which dominated in terms of utilitarian features) over apartment B (which dominated in terms of hedonic features) in the choice-task condition (*Mchoice* = .43, *SD* = 1.95) when compared to the rejection-strategy condition (*Mrejection* = -.55, *SD* = 1.87).

In the cognitive-fatigue condition, the simple main effect of the choice strategy factor did not reach statistical significance (*Mchoice* = -.20, *SD* = 1.95; *Mrejection* = -.34, *SD* = 2.11, $F(1,333) < 1.0$, $p =$ *NS*), indicating no difference in terms of preference for utilitarian versus hedonically dominating apartment attributes.

Fig. #2. Cognitive Fatigue Under Unconscious Processing.



Binary Decision task

A logistic regression on the selection of apartment (utilitarian vs. hedonic) revealed a significant interaction between task type (cognitive fatigue vs. control) and decision task, (Wald $\chi^2(1) = 4.90$, $p = .03$). To explore the nature of the interaction, we compared whether there were significant differences across the distraction task type. Under cognitive fatigue, there was no significant difference in the rejection and choice-decision-task conditions, (*Mchoice* = 42%, *SD* = .50; *Mrejection* = 54%, *SD* = .50, Wald $\chi^2(1) = 2.40$, $p > .10$). In the control condition, the selection proportions were in the predicted direction (*Mchoice* = 54%, *SD* = .50; *Mrejection* = 42%, *SD* = .49) However, the difference did not achieve statistical significance (Wald $\chi^2(1) = 2.59$, $p > .10$) as it did in the likelihood of selection of an apartment rating.

Discussion

In study 3, we replicated the results of study 1 under unconscious processing without cognitive fatigue but not when cognitive fatigue was activated (for the likelihood of selection ratings). Consistent with our proposition that cognitive fatigue impairs unconscious processing, the results were moderated by this construct, supporting the unconscious processing argument we put forward.

Study 4

Study 4 was designed to further test the hypothesis put forward and to expand our understanding of conscious and unconscious decision processes in the domain studied in this research. Up to this point, we have focused on complex decisions concerning hedonic and utilitarian options in choice versus rejection tasks. Prior research in the domain of conscious simpler decisions (e.g., two attributes) found that consumers tend to select utilitarian alternatives in choice tasks, whereas, in rejection tasks, consumers tend to rely on hedonic attributes alternatives (Shafir, 1993; Dhar and Wertenbroch, 2000; Meloy and Russo, 2004), a result that is at odds with the findings of the current research. To test whether our theorizing can accommodate both sets of results, in Study 4, we manipulate the complexity of the stimuli processed prior to the decision. In the complex condition, we expect to replicate the results of study 2. In the simple condition, however, we seek to replicate the results Dhar and Wertenbroch (2000) found when a decision is conscious. However, when the decision is simple and unconscious, we do not expect to replicate the results from Dhar and Wertenbroch (2000), as conscious processing should be beneficial for simpler decisions (because they tend to rely on the working memory), whereas unconscious processing should not be beneficial because properly weighting of a smaller set of attributes does not require the deeper processing provided by unconscious processing.

Participants and Design

Three hundred and ninety-eight participants (240 women; *Mage* = 38.96; *SDage* = 12.34) recruited from Mechanical Turk (MTurk) were randomly assigned to the conditions resulting from a 2 (information complexity: simple vs. complex) x 2 (processing mode: conscious vs. unconscious) x 2 (decision task: choice vs. rejection) full-factorial design. Participants were asked to form an opinion about four different apartments for rent.

Procedure and Stimuli

Participants were told they would be presented with four different apartments featuring a variety of attributes and asked to form a general impression about the four apartments that were available for lease (see the experiment flow in web-appendix D). In the complex condition, we replicated the same scenario as study 2. In the simple condition, the apartments featured two attributes (view and distance to work or school), with the same valence characteristics concerning hedonic versus utilitarian attribute dominance used in the complex condition and in the previous studies. Participants were randomly assigned to one of the eight experimental conditions. The order of presentation of the four apartments was randomized. For each of the four apartments, attributes were displayed on the screen one at a time in random order for four seconds each.

Following the presentation of the information about the apartments, participants in both processing-mode conditions were told that they would later be asked to make a decision about

the apartments. In the conscious-processing condition, participants were told that, prior to that decision, they would have four minutes to write their thoughts about the apartments. They were asked to think about each of the four apartments and write at least one hundred characters about their advantages and disadvantages. In the unconscious-processing condition, participants were told they would participate in a four-minute cognitive task. The distraction task designed to trigger unconscious processing was the same word-search puzzle used in the previous studies. The elapsed time was shown in both processing conditions.

After that, participants were randomly assigned to one of two conditions between choice and rejection. As dependent variables, we recorded apartment decisions using the same measures used in studies 1 and 2. The same attention check, following the Oppenheimer et al. (2009), was used as in the previous studies. At the end of the experiment, participants answered questions about demographic variables and were debriefed, thanked for their participation, and given a code to redeem for compensation through Amazon's MTurk.

Results Manipulation Check

An ANOVA on the task-difficulty measure showed that the task was perceived as more difficult in the complex condition than in simple condition ($M_{complex}$ = 4.67, M_{simple} = 3.72; $F(1,390) = 10.62$, $p < .001$, *Cohen's d* = .33). Except for a two-way interaction between processing mode and decision task ($F(1,390) = 5.351$, $p = .021$, *Cohen's d* = .23), no other main effect or higher-order interactions achieved statistical significance. An inspection of this interaction did not show a statistically significant difference in ratings across decision-task conditions (M_{choice} = 4.45; $M_{rejection}$ = 3.90, $F(1,390) = 1.65$, $p = .20$, *Cohen's d* = .13) in the unconscious-condition. In the conscious-processing condition, participants in the choice-task

condition judged the task to be more difficult in comparison to their counterparts in the rejection-task condition (M_{choice} = 3.78 and $M_{rejection}$ = 4.61, $F(1,390) = 3.96$, *p* , .05, *Cohen's d* = .20).

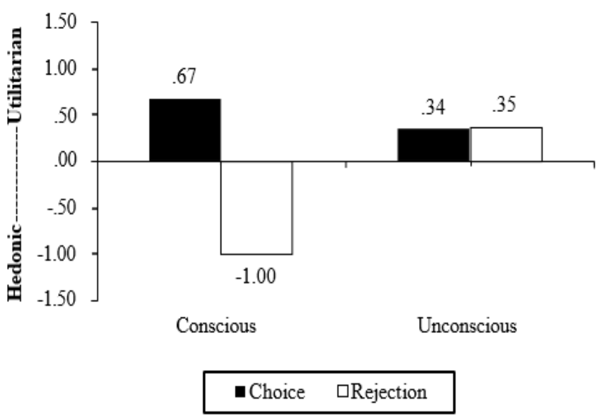
Although we did not expect this difference, we speculate that the effect of having to elaborate on the options combined with the usage of a less familiar decision task (rejection) may have driven this difference in the conscious condition.

Apartment Selection Likelihood

An ANOVA on the likelihood to choose (reject) an apartment (with ratings reversed for those in the rejection condition given the construction of the measure) revealed a statistically significant three-way interaction among the processing-mode, decision task, and the complexity factors ($F(1,390) = 11.83$, $p < .001$, *Cohen's d* = .34). There were also statistically significant processing-mode by decision-task interactions, both in the simple ($F(1,390) = 6.51$, $p = .01$, *Cohen's d* = .25) and complex conditions ($F(1,390) = 5.34$, $p = .02$, *Cohen's d* = .23). An inspection of the simple main effects of the interaction in the simple-information condition revealed that, in the conscious-processing condition, there was a preference for the apartment that dominated in terms of utilitarian attributes over the apartment that dominated in terms of hedonic attributes (i.e., D > B) whereas the opposite was true in the rejection-task condition ($M_{utilitarian}$ = .67, *SD* = 2.41; $M_{hedonic}$ = -1.00, *SD* = 2.25, $F(1,390) = 12.19$, *p* < .001, *Cohen's d* =

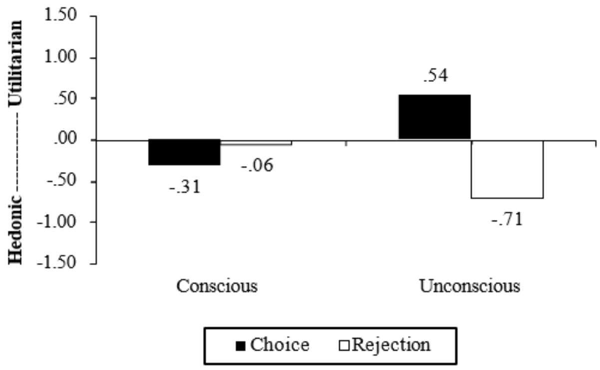
.35). Alternatively, no difference in preference for apartments was observed in the unconscious processing condition across choice and rejection tasks (M_{choice} = .34, *SD* = 2.40, $M_{rejection}$ = .35, *SD* = 2.29, $F(1,390) < 1.0$, *p* = *NS*) with a directional preference for the utilitarian apartment (Figure 3).

Fig #3. Simple Context Condition



An inspection of the interaction between the processing-mode by decision-task factors in the complex-information condition showed no difference across decision-task conditions in the conscious-processing condition (M_{choice} = -.31, *SD* = 2.26; $M_{rejection}$ = -.06, *SD* = 2.25; $F(1,390) < 1.0$, *p* = *NS.*; figure 4), with a directional preference for the hedonic apartment. In the unconscious-processing condition, however, there was a preference for the apartment that dominated in terms of hedonic attributes over the apartment that dominated in terms of utilitarian attributes (i.e., B>D) in the choice-task condition relative to the rejection-task condition ($M_{utilitarian}$ = .54, *SD* = 2.18, $M_{hedonic}$ = -.71, *SD* = 2.30, $F(1,390) = 6.98$, $p = .01$, *Cohen's d* = .27)

Fig. #4. Complex Context Condition



Binary Decision Task

The binary selection of an apartment was coded as 1 when the selection was the utilitarian apartment and 0 when the selection was the hedonic apartment. A logistic regression on the binary selection of the apartment revealed a significant three-way interaction between the information-complexity, processing-mode, and decision-task factors (Wald χ^2 (7) = 8.56, *p*

<.01). The pattern of the data replicated that of the ratings. In the simple-information condition, there was a statistically significant interaction between the processing mode and decision-task factors (Wald χ^2 (1) = 3.88, *p* = .05). A larger proportion of participants selected the utilitarian alternative in the choice-task condition than in the rejection-task condition in the conscious-processing condition (*Mchoice* = .60%, *SD* = 49 *Mrejection* = 32%, *SD* = .47*,* Wald χ^2 (1) = 8.18, *p* <

.01). However, there was no statistically significant difference in choice proportions across the

levels of the decision-task factor in the unconscious-processing condition (*Mchoice* = 52%, *SD* =

.50; *Mrejection* = 51%, *SD* = .50, Wald χ^2 (1) < 0.01, *p* > .95)

In the complex-information condition, there was a statistically significant interaction between the processing-mode and decision-task factors (Wald χ^2 (1) = 4.71, *p* = .03). There was a non-statistically significantly difference in choice proportions across the levels of the decision-task factor in the conscious-processing condition (*Mchoice* = 40%, *SD* = .49; *Mrejection* = 50%, *SD* =

.50, Wald χ^2 (1) = 1.00, *p* > .30). In the unconscious-processing condition, however, a statistically significantly larger proportion of participants selected the utilitarian alternative in the choice-task condition than in the rejection-task condition (*Mchoice* = 57%, *SD* = .50; *Mrejection* = 35%, *SD* = .48, Wald χ^2 (1) = 4.41, *p* = .04).

Discussion

Study 4 showed that decisions about utilitarian-dominated versus hedonic-dominated alternatives vary as a function of processing mode, decision task and decision complexity. In a simple decision context, our results replicate those of Dhar and Wertenbroch (2000) by showing a preference for options that dominate in terms of hedonic attributes when one uses a rejection strategy. Alternatively, in line with Nagpal et al. (2015) and Dhar and Wertenbroch (2000), our results show a preference for options that dominate in terms of utilitarian alternatives in a choice task. We also confirm the proposition of UTT that in a simple set, consumers' use of conscious processing results in the selection of the more utilitarian alternative whereas unconscious processing does not lead to a difference in preference (Dijksterhuis and Nordgren, 2006).

In contrast with Sela and Berger's (2012) finding that individuals prefer hedonic alternatives when confronted with complex information in a choice task under conscious thought, we demonstrate that, under unconscious thought, consumers in a choice task are more likely to choose utilitarian alternatives. This finding is in line with UTT's prediction that the

unconscious can more thoroughly assign weights to attributes, which may decrease susceptibility to biases such as a numerosity bias.

Meta-Analysis for Choice and Rejection Under Unconscious Processing

To further support the results of our studies, we conducted two random-effect meta-analyses of the main effect across choice and rejection under unconscious processing across the four studies, one for the likelihood to select ratings and one for the proportions of binary selection. We expected that preference for hedonic versus utilitarian alternatives would have different effects on rejection or choice conditions under unconscious processing, as supported by the individual studies.

Consistent with our prediction, the meta-analysis of the results of the likelihood-to-select measure revealed a significant difference in the expected effect between the choice and rejection conditions on unconscious processing across all three studies (*Estimate* = .946, *SE* = .185; *CI95%* = [.821, 1.071], *Z* = 5.10, *p* < .001). In addition, a heterogeneity test (*Qtest* = .000, *SD* =

.00; I^2 = 13.90%, *CI95%* = [0%, 13.90%]) shows that the results are homogeneous and consistent across the four studies. The meta-analysis on the binary decision measure revealed a significant difference across all four studies (*Estimate* = .220, *SE* = .047; *CI95%* = [.189, .252], *Z* = 4.737, *p*

< .001). In addition, a heterogeneity test (*Qtest* = .005, *SD = .069*; I^2 = 66.73%, *CI95%* = [25.80%, 85.08%]) shows that the results are homogeneous and consistent across the four studies (see web-appendix F for Forest plot).

General Discussion

Our research investigates how conscious and unconscious processing modes influence decisions when consumers use a rejection or choice task under different levels of decision complexity based on the principles of UTT (Dijksterhuis et al., 2006; Dijksterhuis and Nordgren, 2006). Our research builds upon prior literature that has examined hedonic-utilitarian trade-offs involving choice or rejection tasks (Dhar and Wertenbroch, 2000; Laran and Wilcox, 2011; Sokolova and Krishna, 2016) and the relationship between set sizes and hedonic/utilitarian features (Sela and Berger, 2012) by integrating another theoretical approach that considers the efficacy of conscious and unconscious processing modes under varying levels of task complexity (Dijksterhuis et al., 2006; Dijksterhuis and Nordgren, 2006). In the process, our research allowed for the testing of all possible combinations of complexity and decision tasks in the context studied, a test that has not been performed to the best of our knowledge. Our findings indicate important qualitative departures from the extant literature when complex decisions are preceded by unconscious processing as a function of the type of decision task (choice versus rejection).

For complex decisions, we find a preference for utilitarian alternatives in choice tasks and a preference for hedonic alternatives in rejection tasks, but only when information is processed unconsciously.

Theoretical Contribution

The findings in this research advance marketing literature in several ways by integrating, expanding, and qualifying previous findings. Our research responds to previous calls from researchers on the need for testing the effect of choice and rejection selection strategies on different processing modes (Laran and Wilcox, 2011; Sokolova and Krishna, 2016), different set sizes (Dhar and Wertenbroch, 2000; Laran and Wilcox, 2011) and possible boundary conditions (Dhar and Wertenbroch, 2000; Laran and Wilcox, 2011; Sokolova and Krishna, 2016). We introduce UTT into this area of study and confirm the importance of the concept of unconscious decision-making in this area of decision research and marketing.

Our findings provide substantial insights into the differences between choice, rejection, and processing mode in terms of underlying evaluation processes. Specifically, we add to the research on complex decision tasks by showing through four experiments that these decisions are not only influenced by the decision task (choice vs. rejection) and the nature of the attributes (utilitarian vs. hedonic) but also by whether the information is processed consciously or unconsciously. More broadly, we show that the information-processing mode (conscious vs. unconscious) affects consumer decisions concerning hedonic and utilitarian products.

Second, while Sela and Berger (2012) indicated that consumers prefer hedonic alternatives when facing complex sets of information, we demonstrate in experiment 1 that under unconscious thought, consumers using a choice task were more likely to choose utilitarian alternatives. This finding aligns with UTT's prediction that the unconscious can more thoroughly assign weights to attributes, thereby decreasing susceptibility to biases such as a numerosity bias (Dijksterhuis et al., 2006; Dijksterhuis and Nordgren, 2006). In study 4, we manipulate the complexity of the stimuli processed prior to the decision. In the complex-information condition, we expect to replicate the results of studies 1 and 2. In the simple-information condition, however, we seek to replicate the results found by Dhar and Wertenbroch (2000) when a decision is conscious. We show that our results remain consistent in a different decision context, regardless of the type of attributes and complexity.

Third, our research indicates an important boundary condition established in experiment 3, based on the distraction task when consumers employ a choice decision task. When consumers perform a distraction task leading to cognitive fatigue, they are likely to prefer hedonic over utilitarian alternatives in a choice-task condition. These findings have a potentially significant impact on both consumer behavior theory and marketing practice.

Finally, as previously noted, our findings contribute to the choice and rejection literature. Our results support the idea that the task type not only changes the weights allocated to attribute options (Laran and Wilcox, 2011; Sokolova and Krishna, 2016), but we also show in experiment 2, how this information is processed (Dijksterhuis, 2006) and their possible mechanisms (Manigault et al., 2015; Maranges et al., 2017).

Practical Contribution

Based on the results of our research, we can offer several practical considerations for consumers and marketing managers. For consumers, in a complex context, our findings imply that individuals could benefit by managing their decision strategies according to the number of alternatives and attributes presented and how this information is processed during the decision-making process. For instance, consumers looking for more utilitarian benefits would benefit from using a choice task and allowing information to be processed unconsciously, making this decision after a period of distraction. In contrast, individuals looking for more hedonic benefits would benefit from using a rejection task. When consumers process information consciously, the decision tends toward more hedonic alternatives, regardless of the type of decision task used.

Another possible direct implication involves consumer management of their food consumption. Dieting consumers often use a rejection task to make decisions, eliminating alternatives they cannot or should not eat. However, rejection tasks lead consumers to choose unhealthier (hedonic) rather than healthier (utilitarian) alternatives, resulting in decisions that might be inconsistent with their goals. Instead of using a rejection task, dieters could use a choice task with an unconscious process. When using a choice task, consumers may select healthier (utilitarian) sets.

For marketing managers, we show that companies could benefit from this knowledge through how they present offers. Marketers offering a complex product may assist consumers in making better decisions by distracting them before they ultimately make a decision. This work suggests that allowing unconscious thought to occur would benefit the consumer. In addition to allowing for unconscious thought, marketers interested in selling hedonic alternatives might encourage consumers to adopt rejection-based decision strategies and marketers interested in selling utilitarian alternatives may consider encouraging choice-based decision tasks.

Conversely, if marketers discover which strategy clients use to make their decisions, they can present alternatives more consistent with those strategies.

Limitations and Future Work

This research has a number of limitations. The cognitive-load manipulation used in the second experiment was comprised of visuospatial dot patterns whereas the decision task description was primarily verbal, just as in Manigault, Handley, and Whillock's study (2015). Visuospatial and verbal processing may employ different cognitive resources, and therefore the cognitive-load manipulation might not have sufficiently interfered with the decision task.

However, visuospatial stimuli are preferred in online tasks (Laran and Wilcox, 2011).

Studies in the literature that attempted to test the principles of UTT have a wide variation in distraction tasks. We have chosen to apply a single type of distraction task in our studies since some studies have identified distraction tasks as a possible moderator (Acker, 2008; Nieuwenstein et al., 2015). To be able to control this variation between studies, we have used the word-search task as *ceteris paribus,* where we could vary the information load and make it unsolvable. Future studies could use the same procedures of this research and apply different

types of distraction tasks to confirm these effects found in this research, leading to replications or a new distraction tasks boundary condition.

Future research could examine possible boundary conditions between the processing mode and rejection task. We find that cognitively fatigued individuals using a choice task made similar decisions to individuals using a rejection strategy (study 3). It could be helpful to know if there are conditions under which rejection tasks reverse the effect. Future research could also examine if goal orientation influences decision tasks under different processing modes. Another possible avenue of research would be to understand how the processing mode works or does not work with goal pursuit (Laran, 2016)..

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