

PUCRS

ESCOLA DE NEGÓCIOS
PROGRAMA DE PÓS-GRADUAÇÃO EM ADMINISTRAÇÃO
DOUTORADO EM ADMINITRÇÃO

CLÉCIO FALCÃO ARAUJO

**HOW (UN)CONSCIOUS PROCESSING OF HEDONIC AND UTILITARIAN ATTRIBUTES
AFFECT CHOICE AND REJECTION STRATEGY**

Porto Alegre
2018

PÓS-GRADUAÇÃO - *STRICTO SENSU*



Pontifícia Universidade Católica
do Rio Grande do Sul

ESCOLA DE NEGÓCIOS
PROGRAMA DE PÓS-GRADUAÇÃO EM ADMINISTRAÇÃO
DOUTORADO EM ADMINISTRAÇÃO

**HOW (UN)CONSCIOUS PROCESSING OF HEDONIC AND UTILITARIAN
ATTRIBUTES AFFECT CHOICE AND REJECTION STRATEGY**

Tese apresentada como requisito parcial para para obtenção do grau de doutor em Administração, Programa de Pós-Graduação em Administração da Escola de Negócios da Pontifícia Universidade Católica do Rio Grande do Sul.

Orientador: Dr. Claudio Hoffmann Sampaio

Doctoral dissertation presented in fulfillment of the requirements for the degree of doctor of philosophy in business administration to the Graduation Program in Administration of Business school at the Pontifícia Universidade Católica do Rio Grande do Sul.

Chair: Claudio Hoffmann Sampaio, PhD.

CLÉCIO FALCÃO ARAUJO

Porto Alegre

2018

Ficha Catalográfica

A663h Araujo, Clécio Falcão

How (Un)Conscious Processing of Hedonic and Utilitarian Attributes affect Choice and Rejection strategy / Clécio Falcão Araujo. - 2018.

92 f.: il.

Tese (Doutorado) - Programa de Pós-Graduação em Administração – PUCRS.

Orientador: Prof. Dr. Claudio Hoffmann Sampaio

1. Rejection and Choice. 2. Hedonic and Utilitarian. 3. Unconscious and Conscious. 4. Decision strategy. I. Sampaio, Claudio Hoffman. II. Título.

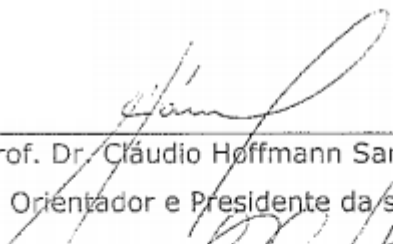
CLÉCIO FALCÃO ARAUJO

**HOW (UN)CONSCIOUS PROCESSING OF HEDONIC AND UTILITARIAN
ATTRIBUTES AFFECT CHOICE AND REJECTION STRATEGY**

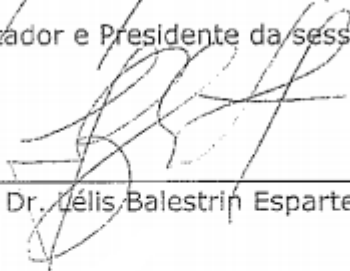
Tese apresentada como requisito parcial para
para obtenção do grau de doutor em
Administração, Programa de Pós-Graduação
em Administração da Escola de Negócios da
Pontifícia Universidade Católica do Rio
Grande do Sul.

Aprovado em 11 de janeiro de 2018, pela Banca Examinadora:

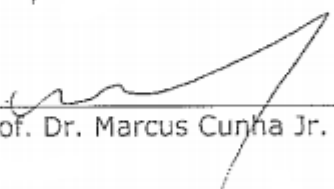
BANCA EXAMINADORA:



Prof. Dr. Cláudio Hoffmann Sampaio
Orientador e Presidente da sessão



Prof. Dr. Lélis Balestrin Espartel



Prof. Dr. Marcus Cunha Jr.



Prof.ª Dr.ª Márcia Dutra de Barcellos

Porto Alegre

2018

ACKNOWLEDGMENTS

First, I would like to thank my advisor Claudio Hoffman Sampaio for his valuable assistance in this study, believing in me as a PhD student and in this research, helping to finance all stages of the study through CAPES funding. I would also like to thank Professor Marcus Cunha, Jr. for accepting me as a visiting researcher at Terry college - UGA during the last months and for his insights. I truly believe that without his help this research would not be possible. I would like to thank both of them for their dedication to my training and for shaping me in who I am and will be as a researcher for the rest of my life.

I would like to thank the professors from the PPGAd/PUCRS, Claudio Damacena, Marcelo Perin, Stefânia Almeida, Lélis Espartel, and professors from PPGA/UCS, Maria Emilia, Pelayo Olea, Eric Dorion for their efforts, provocations, patience and their dedication to transmit their knowledge to every student: you are example for marketing and business academy. To Jeanne Taylor, Aray Chen and professors Julio Sevilla, Son Lan, thank you for all the support received during the period at Terry college – UGA.

I would like to thank Professors Lélis Espartel and Marcia Barcelos for the comments made during this research project, for their time detached in reading of this project and for their contributions to the evolution of this study. A special thanks to my co-authors, they have contributed to my growth as a researcher and professor.

A special thanks to Marcia H. Vieira for the several contributions during this research - without her help this study would not have been written in English - and for the great friendship built during all this period. I would also like to thank Josiane Porto and Renata for all the trips made on several Fridays between Porto Alegre and Caxias do Sul. My colleagues from PUCRS, that have made this time a wonderful experience and for their friendship and support.

I would like to thank PUCRS, UCS and UGA for all the environment provided, for the academic development. A special thanks to CAPES for the four years of scholarship, to the PDSE/CAPES for the five months' scholarship during my time at University of Georgia.

I would like to thank my parents, Beatris and Claureno for believing in me and for all the education that has been given throughout my life. To my brothers Cleber, Carlos and Cleiton for being part of my family and my life.

I would like to thank the (un) patience of my daughter Alana, for being absent for many times, even in her presence, and to the support of my step kids, Brendha and Thiago: you all are the reason why I continue to work harder and harder so I will be able to keep making them proud. A very special thank you to my wife Fabia, for her support during all this time and for always believing in my effort.

Thank you everybody, you are very an important part of my life!

ABSTRACT

Consumers face a trade-off between utilitarian and hedonic alternatives due to which decision-making process they engage. It can occur due to fact that they have to decide between alternatives in complex sets, that can be influenced, at the same time, by the way attributes are processed or by the different decision strategies used. The current literature has demonstrated that there are two possible ways of processing this information: consciously and unconsciously. The conscious process best deals with simple information, while unconscious processing better handles with complex information. As a consequence, individuals can decide between a choice or a rejection strategy. In this way, our proposition was to analyze how the (un)conscious processing of hedonic and utilitarian attributes affects the choice and rejection strategy under different levels of complexity in multiattribute decision making. The results suggest that consumers who face a higher level of complexity and benefit from a period of distraction (i.e., unconscious processing) have an advantage, being abler to integrate relevant information to decision making than when deliberating this information (conscious processing), based on Unconscious Thought Theory. To test the proposition, we carried out 3 experimental studies in an online laboratory. The studies demonstrated that how a processed, conscious or unconscious decision can alter results in choice or rejection strategy. At the same time, it had identified that the type of strategy (choice vs. rejection) used can lead to alternatives with different characteristics (hedonic vs. utilitarian - study 1). In addition, it was possible to infer that cognitive constraints make people less likely to engage in conscious processes (study 2). It had also demonstrated a boundary condition when hedonic and utilitarian attributes are unconsciously processed under a complex context (study 1), as well as individuals in this condition may suffer a deviation in their preferences due to the task of distraction characteristics (study 3). When individuals perform a task that consumes a lot of mental energy (study 3), it can affect the ability to complete subsequent tasks. Finally, through a meta-analysis between choice and rejection we have demonstrated that our effects are consistent. Thus, we have contributed to the decision stray and processing mode literature, showing that the type of strategy is influenced not only by the type attributes of the options, but also by the way this information is processed.

KEYWORDS: Rejection; Choice; Hedonic; Utilitarian; Unconscious, Conscious

RESUMO

Os consumidores enfrentam *trade-off* entre alternativas utilitárias e hedônicas, podendo se envolver em processos de tomada de decisão distintos. Isso pode ocorrer devido ao fato de ter que decidir entre alternativas em um contexto complexo que pode ser influenciado ao mesmo tempo pelo modo como estes atributos são processados ou pelas diferentes estratégias de decisão utilizadas. A corrente literatura tem demonstrado que existem duas maneiras possíveis de processar essa informação: consciente e inconsciente. O processo consciente trata melhor com informações simples, enquanto o processamento inconsciente trata melhor com informações complexas. Como consequência, os indivíduos podem decidir por estratégias de escolha ou rejeição. Desta forma, nossa proposição busca analisar como o modo de processamento de atributos hedônicos e utilitários afeta a estratégia de escolha e rejeição em diferentes níveis de complexidade. Sugerimos que os consumidores que enfrentam um maior nível de complexidade e se beneficiam de um período de distração (ou seja, processamento inconsciente) possuem uma vantagem, sendo mais capazes de integrar informações relevantes para a tomada de decisões do que quando deliberam estas informações (processamento consciente), tendo como base a Teoria do Pensamento Inconsciente. Para testar a nossa proposição, realizamos 3 estudos experimentais em um laboratório on-line. Os estudos demonstram que a forma como uma decisão é processada, consciente ou inconsciente, pode alterar os resultados em uma estratégia de escolha ou rejeição. Ao mesmo tempo, identificamos que o tipo de estratégia (escolha vs. rejeição) utilizada pode levar a uma decisão final a alternativas com diferentes características (hedônica vs. utilitária - estudo 1). Além disso, foi possível inferir que as restrições cognitivas tornam as pessoas menos propensas a se envolverem em processos conscientes (estudo 2). Uma condição de limite quando os atributos hedônicos e utilitários são processados inconsciente sob um contexto complexo (estudo 1), bem como indivíduos nesta condição podem sofrer um desvio em suas preferências devido às características da tarefa de distração (estudo 3). Quando os indivíduos realizam uma tarefa que consome muita energia mental (estudo 3), isso pode afetar a capacidade de completar as tarefas subsequentes. Através de uma meta-análise entre escolha e rejeição demonstramos que os efeitos são consistentes. Desta forma, o estudo contribui para a literatura de decisões estratégicas, mostrando que o tipo de estratégia não é influenciado apenas pelo tipo de atributos das alternativas, mas também pela forma de como estas informações são processadas.

PALAVRAS-CHAVES: Rejeição; Escolha; Hedônico; Utilitário; Inconsciente, Consciente

“Who I am today is the result of yesterday’s choices.
Who I will be tomorrow is the result of today’s decisions
(Pat Messiti)

LIST OF TABLES

Table 1 - UTT's Principles and definition	27
Table 2 - Apartments attributes and valence.....	46
Table 3 - Three-way ANOVA between-subject	50
Table 4 - Two-way ANOVA between-subject	56
Table 5 - Recall attributes	61
Table 6 - Two-way ANOVA between-subject	62
Table 7 - Summary data from experiment 1 and 3	65

LIST OF FIGURES

Figure 1 - Interaction effect of simple context.....	50
Figure 2 - Interaction effect of complex context	51
Figure 3 - Cognitive load under Unconscious Processing.....	56
Figure 4 - Depletion resource under Unconscious Processing	63
Figure 5 - Forest plot Single-paper Meta-analysis.....	65

LIST OF ABBREVIATIONS

α	Alpha de Cronbach
β	Beta
ANOVA	Analysis of variance
<i>CI</i>	Confidence Interval
fMRI	functional magnetic resonance imaging
<i>g</i>	Hedge's Effect size
LEX	lexicographic strategy
<i>M</i>	Mean
<i>n.s</i>	Non significant
<i>p</i>	p-value
<i>SD</i>	Standard deviation
US	United State
UTT	Unconscious Thought Theory
<i>z</i>	z-value
WADD	Weighted Additive Model

SUMMARY

1	INTRODUCTION	15
1.1	DELIMITATION AND RESEARCH PROBLEM.....	18
1.2	RESEARCH OBJETIVES	21
1.2.1	Main objective	21
1.2.2	Specific objectives	21
2	THEORETICAL BACKGROUND	22
2.1	INFORMATION PROCESSING MODE.....	22
2.2	UNCONSCIOUS THOUGHT THEORY	25
2.2.1	Unconscious Thought Theory’s Principles	27
2.2.2	UTT Empirical Applications: Method, Materials and Conditions	32
2.3	CHOICE AND REJECTION STRATEGY	35
2.4	HEDONIC VERSUS UTILITARIAN ATTRIBUTES AND DECISION STRATEGIES.....	38
2.5	DISTRACTION TASKS AND BOUNDARIES CONDITIONS	41
3	STUDIES OVERVIEW.....	44
3.1	STUDY 1 – INFORMATION PROCESSING MODE AND DECISION STRATEGY IN DECISION SETTINGS OF VARYING COMPLEXITY	45
3.1.1	Design and participants.....	45
3.1.2	Procedures and stimuli	45
3.1.3	Results	48
3.1.4	Task Difficulty	48
3.1.5	Decision strategy	49
3.1.6	Discussion.....	51
3.2	STUDY 2 – THE ROLE OF COGNITIVE LOAD ON UNCONSCIOUS PROCESSING	53
3.2.1	Design and participants.....	53
3.2.2	Procedures and stimuli.....	53

3.2.3	Results	54
3.2.4	Memory task.....	55
3.2.5	Task Difficulty	55
3.2.6	Decision strategy	55
3.2.7	Discussion.....	57
3.3	STUDY 3 – THE ROLE OF EGO DEPLETION ON UNCONSCIOUS PROCESSING	58
3.3.1	Design and participants.....	58
3.3.2	Procedures and stimuli	59
3.3.3	Results	60
3.3.4	Distraction task	60
3.3.5	Recall attributes	61
3.3.6	Decision strategy	62
3.3.7	Discussion.....	63
3.4	META-ANALYSIS BETWEEN CHOICE AND REJECTION STRATEGY	64
4	GENERAL DISCUSSION	67
4.1	THEORETICAL CONTRIBUTIONS.....	69
4.2	MARKETING IMPLICATIONS	72
4.3	LIMITATIONS AND FUTURE RESEARCH	74
	REFERENCE.....	76
	APPENDIX A – CONSENT TERM.....	88
	APPENDIX B – EXPERIMENT FLOW STUDY 1 AND 3.....	89
	APPENDIX C – ATTRIBUTES ALTERNATIVES.....	90
	APPENDIX D – WORD-SEARCH PUZZLE	91
	APPENDIX E – EXPERIMENT FLOW STUDY 2	92
	APPENDIX F – COGNITIVE LOAD MATRIX.....	93

1 INTRODUCTION

Jeanne is a new college graduate who recently received a job and who is trying to find an apartment to settle prior to her starting date. She is extremely excited about the new job and all the new opportunities she will have to her avail in the new city where her job is located. She would love to be able to live near her work in a building with a beautiful view to save time and money while being able to experience the great restaurants in town and the art scene. As she explores the many apartment options, she quickly realizes that she faces important trade-offs to achieve the work-life balance she envisioned for herself given the budget she set for housing. On top of being overwhelmed by the number of options and attributes she needs to consider, she learns that, to achieve her ideal in terms of utilitarian consumption (e.g., time and money), she will have to give up what she had envisioned for her new life in terms of hedonic consumption (experiential) or vice-versa.

Consumers who face trade-offs between utilitarian and hedonic alternatives can engage in distinct decision making processes as a consequence. This can occur because of the complex nature of deciding among alternatives in a large set, which can be influenced by several factors such as the predominance of a specific type of information (Batra and Ahtola, 1991; Dhar and Wertenbroch, 2000; Sela and Berger, 2012), influence of context (Laran and Wilcox, 2011) or adoption of different decision strategies (Sokolova and Krishna, 2016; Meloy and Russo, 2004).

When it comes to the adoption of different decision strategies, the extant literature generally agrees that decision strategies might take two general forms: choice or rejection. When consumers use a choice strategy, they select one option and, implicitly, reject all others. Alternatively, when consumers employ a rejection task, they eliminate options and, implicitly, hold on to one option as their final selection (Meloy and Russo, 2004). Regardless of which decision strategy is used by consumers, these strategies are often seen as a comparative process in which consumers adopt different criteria for their decisions (Batra and Ahtola, 1991; Dhar and Wertenbroch, 2000).

The consumer behavior literature has documented significant differences in the decisions that follow choice or rejection strategy (e.g., Laran and Wilcox, 2011; Nagpal, Lei and Khare, 2015, Sokolova and Krishna, 2016). Such differences are expected because, in choice tasks, participants tend to focus, heavily, on utilitarian attributes (Shafir, Simonson and

Tversky, 1993) whereas, in rejection tasks, consumers tend to place more emphasis on hedonic attributes (Shafir, 1993; Dhar and Wertenbroch, 2000; Meloy and Russo, 2004). Although these studies indicate that consumers present these strategies as a basis for their decisions (Shafir, Simonson and Tversky, 1993; Dhar and Wertenbroch, 2000), recent studies indicate that there are conditions under which the predicted relationship between decision strategy and utilitarian versus hedonic alternatives may reverse. For instance, Laran and Wilcox (2011) have demonstrated that consumers' decisions are determined by how much they elaborate on information associated with their preferences. Being that the choice encourages elaboration on information that is consistent with one's preference. Whilst rejecting encourages elaboration on information that is inconsistent with one's preference, leading to preference-inconsistent decisions. Sokolova and Krishna (2016) showed that, for rational (cognitive) decisions, as applied to losses and gains, participants facing rejection tasks need more time to deliberate their decision than their counterparts facing choice tasks.

Processes involving choice tasks in complexity set have been extensively studied (Chernev, Bockenholt and Goodman, 2015; Strick et al., 2011; Scheibehenne, Greifeneder and Todd, 2010). However, studies on complex decisions involving rejection tasks in this context are rare (Laran and Wilcox, 2011). Most studies based on decision strategies tend to focus on binary decisions involving few attributes for each option. For instance, Krishnamurthy and Prokopec (2010) argue that a rejection task provides greater satisfaction with the decision when a mental provision is not present. Laran and Wilcox (2011) argue that consumers take more time to choose the best option in a rejection task than in a choice strategy. Sokolova and Krishna (2016) showed that consumers under rejection strategy (vs. choice) need to use a conscious deliberative process. These authors argue that consumers may need greater emotional and cognitive ability to process information when they perform a rejection strategy (vs. a choice strategy; Krishnamurthy and Prokopec, 2010; Laran and Wilcox, 2011; Sokolova and Krishna 2016). In sum, prior research indicates that rejection tasks seem complex, deliberative, thought-oriented, and resources consuming (Sokolova and Krishna 2016; Heller, Levin and Goransson, 2002).

In contrast, an alternative body of literature suggests that consumers facing greater level of complexity would benefit from a period of distraction (i.e. unconscious processing), than when in conscious deliberation (Wilson and Schooler, 1991), leading to more satisfactory choices (Dijksterhuis, 2004, Dijksterhuis et al., 2006, Dijksterhuis and Nordgren, 2016). The proposed decisional benefits stemming from distraction are somewhat intriguing given that

theories in consumer behavior assume that distraction should be avoided because consumers could deliberate (un)consciously on several other alternatives (Chaiken, 1980; Petty, Cacioppo and Schumann, 1983; Slovic, 1982). Although the benefits derived stemming from distraction might seem counterintuitive, there are evidences that it may be beneficial when people are face the process of complex decisions (Dijksterhuis, 2004; Bargh, 2011; Dijksterhuis and Nordgren, 2016). For instance, Messner and Wanke (2011) show that when consumers choose from a large praline chocolate assortment, they have the highest decision satisfaction under unconscious thought than under deliberate. Thereby, Unconscious Thought Theory (Dijksterhuis et al., 2006), proposes that when individuals face complex decisions they choose superior alternatives under deliberation-without-attention (i.e., unconscious deliberation) compared to individuals who make complex choices under a conscious deliberation process (Dijksterhuis, 2004; Dijksterhuis et al., 2006).

Based on the Unconscious Thought Theory (UTT) and differently from the current literature on choice and rejection, we hypothesize that depending on how information about the attributes alternatives is processed they may cause reverse decisions for alternatives with hedonic versus utilitarian features in a different set. Through, three studies we demonstrate that by changing the way decision is elaborated (Wilson and Schooler, 1991, Dijksterhuis at al, 2006) and size set (Dijksterhuis at al, 2006) results in a strategy of choice or rejection may change. At the same time, we identify that the type of strategy used may lead to a final decision on products with different characteristics (hedonic vs. utilitarian). Specifically, a boundary condition is shown when hedonic and utilitarian attributes, in a complexity set, are elaborated under conscious or unconscious thought.

The present research makes several important contributions. First, we contribute to the literature on choice versus rejection strategy (Sokolova and Krishna, 2016, Laran and Wilcox 2011) by demonstrating that information processing mode (Wilson and Schooler, 1991; Dijksterhuis at al, 2006) affects the importance and evaluations of hedonic and utilitarian alternatives (Laran and Wilcox 2011; Dhar and Wertenbroch, 2000) in different sets (Nagpal, Lei and Khare, 2015, Sela and Berger, 2012). Second, differently from Sela and Berger (2012) that show that consumer prefers hedonic alternatives under complexity sets, we demonstrate that under unconscious thought, consumers in a choice strategy are more likely to choose utilitarian alternatives. Third, individuals in unconscious processing may suffer a deviation in his preferences due to the characteristic of the task of distraction. It is important to highlight that we identify a novel boundary condition: when consumers performing a distraction task that

it leads to depletion, they are likely to prefer more hedonic than utilitarian alternatives in a choice strategy condition.

This study is organized as follows. First, we present delimitation and research problem. Second, we discuss the body literature to support this research and build up our main proposition. Third, we show an overview of the three studies and present each one and their findings and we performed single-paper meta-analysis to confirm that our studies support our theoretical framework. By the end, we discuss the theoretical and marketing implications of research, limitations and future research.

1.1 DELIMITATION AND RESEARCH PROBLEM

Consumers often face with a large number of alternatives in a variety of context, including places to live, trip destinations and a growing number of product options that are available in the market (Scheibehenne, Greifeneder and Todd, 2010). Such diversity can result in overload information (Schwartz, 2000; Turnbull, Leek and Ying, 2000). Once a decision under a large set of options may be compound by alternatives which are made up of a number of attributes (e.g. different models of car with different types of attributes), and each of these attribute can have a different weight for each individual. This combination, between alternatives and attributes forms a complex context for decision-making. The term complex context is used to refer to a scenario in which consumers need to make a decision, when multiple alternatives, attributes and different valences are presented (see, Dijksterhuis and Nordgren, 2016; Chernev, Bockenholt and Goodman, 2015).

The decision-making literature has proposed several models and theories in order to understand how consumers make decisions when facing a complex context. The mainstream, based on cognitive psychology, focuses on understanding the conscious process used by individuals and the cognitive limitations they have when confronted with a large number of information pieces (Simon, 1955; Scheibehenne, Greifeneder and Todd, 2010). An alternative view has been reported by Dijksterhuis and colleagues (2006), through UTT, have demonstrating that the unconscious shows a superior capacity in dealing than conscious processes with a large set of information for decision-making (Messner and Wänke, 2011; Dijksterhuis and Nordgren, 2016). Although several studies have presented inconsistent results

for the both approach, some meta-analytic studies (Chernev, Bockenholt and Goodman, 2015; Strick et al., 2011; Scheibehenne, Greifeneder and Todd, 2010; Acker, 2008) were performed within each of paradigms (conscious and unconscious) and some moderating variables were presented in order to solve such inconsistencies. Meta-analyses performed by Scheibehenne, Greifeneder and Todd (2010) and Chernev, Bockenholt and Goodman (2015) point out that, in conscious decisions, four key factors, were identified: choice set complexity, decision task difficulty, preference uncertainty, and decision goal. These factors moderated the impact of assortment size on choice overload. These studies were also performed on the unconscious thought effect by Acker (2008) and Strick et al. (2011), who have founded an effect size $g = .224$ (CI 95% = .145 to .303) demonstrating that the unconscious has superiority over the consciousness in decision-making, when there is a complexity context. Thus, several moderators were identified that helps to explain the mixed results across various studies, such as complex problems, attributes presentation, distractions task type and so on.

The information complexity around attributes can be observed in the literature, through products that have hedonic and utilitarian characteristics (Batra and Ahtola, 1991; Nagpal, Lei and Khare, 2015) or negative and positive characteristics (Dijksterhuis and Nordgren, 2016). According to Hirschman and Holbrook (1982), the consumption of hedonic attributes is primarily characterized by an affective and sensory experience of aesthetic or sensual pleasure, fantasy, and fun. Strahilevitz and Myers (1998) the consumption of utilitarian attributes are more cognitively driven, instrumental, and goal oriented and accomplishes a functional or practical task. In the present research we focus on the hedonic and utilitarian feature and positive and negative valence of each characteristic.

In their study, Spangenberg, Voss and Crowley (1997, p. 265) have been demonstrated that "hedonic attributes are experienced at both affective and cognitive levels, while utilitarian attributes, which may also include both affective and cognitive dimensions, are dominated by more cognitive elements". For Sela and Berger (2012), consumers often consider hedonic attribute information when choosing among a large set of products, because attributes are such as a heuristic cue for product usefulness. They also have shown that amount of attributes tends to benefit more hedonic than utilitarian options and, consequently, have systematic effects on choice. Alternatively, through two experimental studies proposed by Wang et al. (2015) the authors have, somehow, collaborated to explore the frontier of this knowledge, demonstrating that consumers prefer products with more affective (i.e. hedonic) attributes when they process information under unconscious thought and, on the other hand, prefer products with more

cognitive (i.e. utilitarian) attributes when processing information under conscious thinking. This proposition is in line with the findings of Wilson et al. (1993) since for consumers under conscious thought, consider utilitarian attributes more important in relation to product decision. Dijksterhuis and Nordgren (2006, p. 107) also argue that the superior performance of a decision through unconscious thinking can occur because "the unconscious somehow uses affective (hedonic) information better than conscious thought".

Although the literature presents contradictions of how the processing of hedonic and utilitarian information in large sets, we believe that this trade-off can be influenced by the type of decision strategy (choice versus rejection) employed during the decision process (Nagpal, Lei and Khare, 2015; Dhar and Wertenbroch, 2000). As hedonic attributes are weighted more strongly under rejection strategies, utilitarian attributes are weighted more strongly under a choice strategy, because options that are superior in hedonic attributes help to minimize a negative emotion (Dhar and Wertenbroch, 2000). In contrast, consumers under a choice strategy tend to focus more on utilitarian attributes, which provide more cognitive and instrumental functions (Dhar and Wertenbroch, 2000; Hirschman and Holbrook, 1982; Shafir, Simonson and Tversky, 1993).

The present literature has shown that the decision strategies used by consumers may present reversals decision (Sokolova and Krishna, 2016; Laran and Wilcox, 2011). However, there are evidences that were not investigated yet, presenting a relevant gap in the literature. As an example of the lack of further investigation, Laran and Wilcox (2011) have proposed that rejection strategy will reverse preference compared to choice tasks in large choice sets as they do in simple sets, it is essential to investigate the relation between the decision strategy and choice under complex sets. As well as, Dhar and Wertenbroch (2000) point out that complexity and task realism in choice and rejection strategy from a set of more than two alternatives may induce different decision processes that may change the proposed effect by them. Alternatively, Sokolova and Krishna (2016) have suggested that feeling-based (vs. deliberative) processing may sometimes lead to superior decision outcomes (Dijksterhuis 2004). For example, feeling-based processing can outperform deliberation in contexts where access to unconsciously acquired information is necessary to make more accurate decisions. Due to this possibility, the research problem of the present study is: **How the (un)conscious processing of hedonic and utilitarian attributes affect the choice and rejection strategy under different levels of complexity in multiattribute decision making?** In other words, does the processing mode (unconscious vs. conscious) of hedonic and utilitarian features can modify the effect on the

choice or rejection strategy? Will individuals engaged in unconscious or conscious process choose or reject different alternatives, when there are different levels of complexity in multiattribute decision making? And when that alternatives are compounded by different attributes? Which is the mechanism underlying it this relationship?

1.2 RESEARCH OBJETIVES

1.2.1 Main objective

- To analyze how the (un)conscious processing of hedonic and utilitarian attributes affect the choice and rejection strategy under different levels of complexity in multiattribute decision making.

1.2.2 Specific objectives

- To analyze how different levels of complexity interact between the processing mode and decision strategy.
- To analyze the effect of conscious processing of hedonic and utilitarian attributes on the choice and rejection strategy.
- To analyze the effect of unconscious processing of hedonic and utilitarian attributes on the choice and rejection strategy.
- To verify factors that interfere in the processing mode of hedonic and utilitarian attributes on the choice and rejection strategy.

2 THEORETICAL BACKGROUND

In this section the theoretical background is presented in order to clarify and connect the themes approached in this research and build up our main proposition.

2.1 INFORMATION PROCESSING MODE

The field of judgment and decision-making has been dominated by an economic perspective (Oppenheimer and Kelso, 2015). According to it, the goal of any decision-making process is to find a strategy that leads the best result, requiring minimal effort (Baker, 2011). This approach has shown decision-making as a matter of rationality, objectivity, and reflection (Edwards, 1961; Dawes and Corrigan, 1974). Thus, attention concentration, information search, problem solving, and rule enforcement are evidence to this approach (Laran, Janiszewski and Salerno, 2016).

Studies that use the economic perspective with more rational models such as the Weighted Additive Model (Keeney and Raffia, 1976, Edwards and Newman, 2003), Expected Utility Theory (Neumann and Morgenstern, 1947) and Expected-value Model (Simon, 1955), assume that information processing and conscious decision-making may be better with logical problems and precise quantities. Dawes (1979) shows that a weighted model is more robust in making predictions than using intuition to predict numerical criteria. Similarly, Claxton (1997) presents strong evidence that the conscious has greater ability to deal with mathematical problems or that they require stricter rules. At the same time, decision making theorists concerned themselves with the nature of an ideal decision maker under conditions of uncertainty (Oppenheimer and Kelso, 2015, p. 280). Studies have shown that conscious decisions are inherently slow, sequential and have limited processing capacity (Evans, 2008). In addition to being limited by working memory capacity, conscious thinking is also prone to biases and heuristics that may lead to suboptimal or irrational decisions (Runnion, 2009).

Over decades, economics theorists (Tversky and Kahneman, 1981; Tybout, Calder and Sternthal, 1981) have developed a series of different models, strategies, and theories about this paradigm to try to explain how people process information for decision-making. Despite these efforts, the literature has not always demonstrated robust effects in relation to these strategies,

as the results may vary according to some conditions presented. However, during these period psychologists have been finding results how does not to be explained through this paradigm, to the point where it is no longer surprising to observe violations of rational behavior (Oppenheimer and Kelso, 2015). They started to show, in the psychology field, new information processing models as reasonable alternatives for this violations. Two main alternative approaches have been highlighted. This approach takes into account that there are two ways to process information, conscious and unconscious (Wilson and Schooler, 1991; Chaiken and Trope, 1999; Dijksterhuis and Nordgren, 2006).

The first approach, has shown that the unconscious is as proficient as conscious to make decision (Kahneman, 2003; Bargh, 1990). This theoretical approach considers conscious and unconscious processes as complementary rather than competing systems (Baumeister and Bargh, 2014), since the conscious has a high influence on behavior and unconscious processes have a considerable influence on shaping the content of consciousness (Baumeister and Bargh, 2014). This line of thought has been influenced by the Dual-process theory (Chaiken and Trope, 1999; Gawronski and Creighton, 2013). Dual process theories are often applied in social, personality, cognitive or clinical psychology and is also found in economics (behavioral economics) and sociology (Lizardo et al., 2016). This theory assumes that there are two distinct modes of information processing, for which I use the most neutral terms available in the literature, System 1 and System 2 processes (Chaiken and Trope, 1999). Such modes are distinguished by different cognitive processes in the way they operate. While the system 1 operates unconsciously, fast, automatic, and high capacity, the system 2 operates consciously, slowly, deliberately, and in a limited way (Kahneman, 2003, Evans, 2008). This theoretical approach helped to understand past behaviors that were, initially, assumed to be automatic, and later being identified as processes that were not purely automatic, but rather as joint contributions between automatic and controlled processes (Gawronski and Creighton, 2013). Baumeister and Bargh (2014) conclude by stating that the integration of conscious and unconscious processes is necessary to meet the critical needs of the human being and facilitate the pursuit of important goals.

The second approach takes on that there are two possible ways to make decisions: thinking conscious or unconscious. The conscious processing is considered more complex as the individual need to spent great attention thinking in order to deliberate, while the unconscious processing, needs time to deal with information before to deliberate (Waroquier et al., 2009). This approach has shown that conscious thought has a limited capacity, and so it is only possible

to make a decision when individual is presented to a small amount of information. However, unconscious thought has considerably more capacity and greater ability to deal with complex situations (Dijksterhuis and Nordgren, 2006). On the other hand, the rational paradigm has demonstrated that in complex decisions individuals must carefully consider and process the different characteristics or options and choose the one that best matches their initial goals. Seminal studies developed by Wilson and Schooler (1991) challenged the current economic paradigm. In their study, the authors carried out two experimental groups to make a decision about university courses. The members of the first group were asked to think about their reasons for the decision, whereas for the second group this reflection was not necessary to think to make a decision. Their findings demonstrated that the second group performed better on their final decision, providing evidence that there may be detrimental effects when thinking hard about a decision. Based on this evidence, Dijksterhuis and Nordgren (2006) proposed the Unconscious Thought Theory (UTT). The UTT differs from other theories and models in a variety of aspects, however the most valuable contribution of this theory is the idea of the existence and benefits of the unconscious thought (Dijksterhuis and Nordgren, 2006).

The UTT seeks to overcome the limitation imposed by conscious thought, as when it faces complex decisions, the latter presents a lower performance, due to its limited processing capacity, while unconscious thought does not have this kind of restriction. On the other hand, different studies have found conflicting results regarding UTT, such as their theoretical validity (Newell and Rakow, 2011; Nordgen, Bos and Dijksterhuis, 2011), methodological application (Waroquier et al., 2009) and possible alternative explanations (Srinivasan and Mukherjee, 2010; Newell and Rakow, 2011). In order to clarify these contradictory results, meta-analytical studies proposed by Strick et al. (2009) revealed a great heterogeneity among the different studies, as well as moderating variables for the process, thus demonstrating an advantage of unconscious over the conscious thought in a complex context.

Although each of these theoretical approaches has its merit, the theory adopted in this research takes into account the two distinct modes of information processing, unconscious and conscious thought. According to the proposed research, the UTT (Dijksterhuis and Nordgren, 2006) adequately fits as it proposes to several benefits, when consumers are presented to situations where there is complexity among multiple alternatives attributes to make a decision.

2.2 UNCONSCIOUS THOUGHT THEORY

The Unconscious Thought Theory (Dijksterhuis et al., 2006; Dijksterhuis and Nordgren, 2016) has emerged to provide a solution to problems of limited cognitive ability, since conscious thinking generally takes into account only a subset of information for decision-making (Srinivasan and Mukherjee, 2010). The essence behind UTT is the process of deliberation-without-attention, known as distraction, rather than considering issues and decisions carefully and systematically. This distraction mechanism causes the information to be processed by the individual without consciousness, that is, while the working memory focuses on more practical tasks and objectives, the unconscious continues to work on the complex information that was previously processed (Dijksterhuis et al., 2006; Dijksterhuis and Nordgren, 2016).

Dijksterhuis and colleagues developed the UTT based on two modes of thought that help individuals to make better judgments, decisions, choices and creative solutions (Dijksterhuis and Nordgren, 2016). In the first thought mode, individual can reflect upon the issue consciously, deliberately, methodically, logically, and analytically (Dijksterhuis and Nordgren, 2016). They could, for example, compare two different apartments with different attributes in sequence, ascertaining which alternative shows the best option. In the second mode, individuals can utilize their intuitive preferences, which seem to emanate from a set of unconscious processes. They may, for example, consider different kind of apartment briefly, distract themselves, for a while, and then trust in their intuition to make a choice (Dijksterhuis and Nordgren, 2016).

According UTT, conscious thought is recognized by a spontaneously executed task involving little or no information processing, it is practically based on heuristics (Dijksterhuis and Nordgren, 2016). Heuristics are decision strategies used by individuals who operate in a more complex and elaborated way, without using any shortcut or clue that can guide the decision maker (Bettman, Luce and Payne, 1991). Consciousness is more effective when it is necessary to decide between alternatives that would vary among two or three attributes only, because this mode of thought is more precise (Bargh, 2011). Bargh (2011) take into account that in conscious thought, attention is focused on the task itself, and the problem must be fully weighed before a final decision.

Alternatively, unconscious thought is defined as more cognitive and/or affective processing that occurs outside consciousness (Dijksterhuis and Nordgren, 2016). When the alternatives vary on many attributes, or the implications of these qualities are unclear or unpredictable, such as when individuals need to decide which house or car to purchase under complex context. In these cases, unconscious thinking ensures better decisions than does conscious thinking (Dijksterhuis, Bos, Nordgren and Van Baaren, 2007). It is more appropriate to use when there are many attributes. The unconscious is able to better organize information than conscious, because conscious does not take into account any quality or key factor (Bargh, 2011). It is characterized by the deviation of attention at the moment of information processing, there is no need to a weighting of attributes (Dijksterhuis and Nordgren, 2006). The unconscious thought is able to incorporate large quantity of information, whereas conscious thought its capacity is quite limited. These modes of thinking differ from one another according to the amount of information being processed and the amount of attention spent during a task (Dijksterhuis and Nordgren, 2006).

Dijksterhuis (2004) has noted, for the first time, that unconscious thinkers tend to maintain evaluative representations of more coherent choices. Dijkstra and colleagues (2012) showed that conscious thought, in contrast to unconscious, tend to confine attention to specific features. In contrast, unconscious thought increases the likelihood that attention is distributed across a broader array of features. This focus of attention may explain some of the benefits of unconscious over conscious thought. This argument is supported by Abadie, Waroquier and Terrier (2013), who reported that unconscious thinking increases in memory of attributes that are more relevant and more effective for the features that are important at the time of decision than the unimportant attributes ones (Bos et al., 2011). These studies have suggested that unconscious thought has an advantage over conscious thought, being more capable of integrating information that is relevant to decision making (Bos et al., 2011; Abadie, Waroquier and Terrier, 2013). Thus, unconscious thinking is more holistic, better organized and superior when relating to more complex decision making.

Dijksterhuis and colleagues consistently found that the unconscious thought condition may have produced the best choices for complex decisions, differently from conscious deliberation and the immediate judgment conditions. Alternatively, conscious thought was found to be better for simple choices (Bargh, 2011). Based on these findings, we predict that individuals when making a complex decision, need to use the unconscious process as best strategy, and when making a simple decision, the conscious process is the best strategy.

2.2.1 Unconscious Thought Theory's Principles

The UTT, in its complexity, develops a set of principles related to the way that unconscious and conscious operates. It is shown in six principles: i) unconscious thought principle, ii) the capacity principle; iii) the bottom-up versus top-down principle; iv) the weighting principle; v) the rule principle and vi) the convergence versus divergence principle, for summarize (see Table 1).

Table 1 - UTT's Principles and definition

Principles	Definitions
Unconscious Thought Principle	This principle supports that conscious and unconscious thought have different characteristics and each mode of thought is more appropriate to specific situations. Attention is considered the key to differ conscious and unconscious thought, since conscious needs attention and unconscious thought deviates attention to another activity.
The capacity Principle	This principle says that the conscious thought is affected by its low capacity. It can save, temporarily, only seven items, leading to poor decisions and choices. Besides that, conscious thought is only able to make less precise assessments and its focus is limited in relation to attributes.
The bottom-up vs. top-down Principle	This principle says that the thought processes are hierarchical or happens from the top to the bottom, while automatic thoughts are the opposite. This principle consists in the idea that the unconscious thought works bottom up and reveals values integrating information in order to constitute precise judgments and conscious thought works top down and build values guided by expectations and schemas.
The weighting Principle	This principle is based on the idea that unconscious thought is able to weight the importance of several attributes, while conscious thought, generally, weights in a less precise way because it is not it's natural process of work.
The rule principle	This principle supports that conscious thought follows strict and precise rules, what is ideal in moments of taking decisions, while unconscious thought could only estimate and does not follow rules.
The convergence x divergence Principle	This principle is considered more relevant in cases of creativity than in taking decisions or judgments, since the creativity is directly linked to the notion of incubation, when the unconscious activity keeps working if the conscious attention is directed to another place.

Source: Dijksterhuis and Nordgren (2006).

These principles take into account the application of UTT in different situation, as creativity, moral decision (Ham and Van den Bos, 2010), satisfaction large assortment (Messner

and Wänke, 2011), real state decision (Abadie, Waroquier, and Terrier, 2013), judgments, and choice (Strick, Dijksterhuis, and Van Baaren, 2010). In the present research, we consider the four principles (unconscious thought principle, the capacity principle; the bottom up vs. top down principle; and the weighting principle) once that they contribute to explaining our study.

The Unconscious Thought Principle supports that there are two different modes of thought: unconscious and conscious. These two modes present different characteristics, which make them distinct in their applications, uses and in different circumstances (Dijksterhuis and Nordgren 2006). Different of the dual process theory, which assumes that conscious thought has a high influence on behavior and unconscious processes have a considerable influence on shaping the content of consciousness (Baumeister and Bargh, 2014), this principle postulates that conscious and unconscious thought work independently and perform different functions. In this principle, attention is the key factor for distinguishing between the two types of thoughts. In conscious thought the decision is made based on attention in details and in unconscious thought the decision maker does not need to pay attention to the decision making, that is, the attention of the individual is directed to another place (Dijksterhuis and Nordgren 2006). The capacity principle says that the conscious thought is affected by its low capacity. It can save, temporarily, items what take to poor decisions and choices. Besides that, conscious thought is only able to make more precise assessments and its focus is limited in relation to attributes (Wilson and Schooler, 1991).

Prior to the proposition of unconscious thought principle by Dijksterhuis and Nordgren (2006), Zajonc (1980) and Kunst-Wilson and Zajonc (1980) had already proposed an association between conscious processing with more cognitive operations and unconscious processing with more affective judgments. The findings of Zajonc (1980) demonstrate that the effect after processing a stimulus followed by a distraction presents more reliable affective decisions (Gonzalez-Vallejo et al., 2008). Although both processes - unconscious and conscious - are used to make judgments about the same set of stimuli, Zajonc (1998) argues about the independence of affect and cognition, and goes further, by postulating a predominance over affective characteristics, and proposing that a first reaction to a sensory stimulus is given by a more affective reaction.

The capacity principle proposes that conscious thought has a low capacity for information processing, whereas unconscious thought does not have this restriction, since a superior processing capacity is observed. The theory of limited rationality (Simon, 1955) assumes that people use simple strategies for information integration. The limitation in

information processing may cause people to use heuristics or choice strategies that are made up of mental shortcuts, in order to minimize the cognitive effort required by a highly complex decision-making task (Kahneman, 2003; Bettman, Luce and Payne, 1998; Simon, 1955, Tversky and Kahneman, 1974).

This principle is anchored on the premise that “there are finite limits to the human being's ability to assimilate and process information over a period of time; once these limits are exceeded, behavior tends to become confused and dysfunctional” (Jacoby, Speller and Kohn, 1974, p. 33). Thus, Bettman, Johnson and Payne (1991) point out that this effect is due to the limitations presented by working memory (conscious), which is able to store only a small amount of information relevant to the resolution of a decision problem. Wilson and Schooler (1991) have explicitly argued that low awareness can lead to wrong decisions or choices, demonstrating that conscious thought leads consumers to focus on a limited number of attributes at the time of their decision.

On the other hand, unconscious thought does not have this restriction, because it has more information processing capacity (Bos, Dijksterhuis and Van Baaren, 2008, 2011; Dijksterhuis, 2004; Dijksterhuis et al., 2006). Thus, unconscious thinking, when confronted with a difficult or complex decision, may perform better than conscious. In support of this position, Dijksterhuis (2004) found that people make optimal decisions when the problem is thought unconsciously, especially when the amount of information to be considered is relatively large. It is possible to see in this principle is not only the superiority of the unconscious over the conscious in difficult or complex context, but also the superiority of the conscious over the unconscious when it comes to simple context or for the evaluation of options with propositional rules and quantities precisely, as is the case with mathematical operations (Nordgren, Bos and Dijksterhuis, 2011).

The bottom-up versus top-down principle is based on Sloman (1996) that argues that the thought processes are hierarchical, or happens from the top to the bottom, while automatic thoughts are the opposite. This principle consists in the idea that the unconscious thought works bottom up and reveals values integrating information in order to constitute precise judgments and conscious thought works top down and build values guided by expectations and schemas (Nordgren et al., 2011). Besides, it supports the idea that stereotypes are formed by triggers in an automatic way and people are not conscious about it. In addition, this principle says that unconscious thought takes a better organization in individual's memory and is motivated by goal pursuit way (Waroquier et al., 2010).

Studies based on neuroscience has shown that top-down processes also regulate the unconscious processes of the brain (Kiefer, 2012; Creswell, Bursley and Satpute, 2013). This principle suggests that unconscious thinking works best when the coding of attributes and characteristics occurs impartially and completely, even before the choice decision is defined (Dijksterhuis and Nordgren, 2006). Unconscious thinkers can better organize information in memory. In addition, they are able to recall more information in a global way than conscious thinkers (Dijksterhuis and Nordgren, 2006). They have a better memory organization and the mental representation of a relevant object becomes more polarized.

The weighting principle it is anchored in the Weighted Additive Model (WADD). The weighted additive decision suggests six necessary steps in a decision-making process for complex contexts: i) list the important attributes; ii) weigh each attribute; iii) evaluate the attributes in all alternatives; iv) multiply the score of the attributes of each alternative with its due weights; v) add the attributes to each alternative; and vi), select the alternative with the highest/best score (Tversky and Kahneman, 1986; Edwards and Newman, 2003). However, studies (Chernev, Böckenholt and Goodman, 2015; Scheibehenne, Todd and Greifeneder, 2010) have shown that this process, which is based on conscious processing, is unable to be obtained through the weighted additive strategy due to the limited capacity presented by conscious thought. Given this limitation, in more complex decisions, the highlight point of this theory would be the possibility to encode all the necessary information about the attributes of the alternatives and then deviation attention from the decision so that the unconscious make better decision (Dijksterhuis and Nordgren, 2006; Dijksterhuis et al., 2006; Dijksterhuis, 2004). On the other hand, WADD rules are highly complex and following these rules is impossible during unconscious thinking (see, principle of rule). In contrast, unconscious thought processes on complex information are quite similar to WADD. This suggests that although unconscious thought is not used in the WADD strategy, its results are closer to what the WADD could predict through conscious thinking (Dijksterhuis and Nordgren, 2006).

The rule principle shows that conscious thought is able to pursue somewhat rigid rules and/or obtain more precise answers, such as arithmetical results. Conscious thought performs well on simple tasks, because it follows stricter rules, which makes it more precise in these activities. On the other hand, unconscious thought is limited because could only estimate and does not follow rules (Dijksterhuis and Nordgren, 2006). Thus, unconscious thought cannot follow any set of pre-established rules, since its decisions are based on a more holistic view (Dijksterhuis et al., 2006). Dijksterhuis and Nordgren (2006, p. 105) proposed that: “When a

decision strategy guarantees the careful and rigorous application of a specific rule, as in a lexicographic strategy (LEX) and conscious thought must be used. Things have become more complex, as in the Weighted Additive model, using unconscious thinking is more recommended".

Study by Deutsch, Gawronski and Strack (2006) also reported that the unconscious is unable to follow rules. In this study, consumers were subjected to a prime effect stimulus with words (e.g. bad) or other terms corresponding to negatives (e.g. not good), so this information was coded unconsciously through the prime effect, but it can be seen that these consumers could not identify this pattern, since consumers who received words "not good" interpreted them as "good". To a certain extent, the studies of Dijksterhuis (2004) have shown that the use of negation does not present itself as a hindrance to unconscious thought, as long as it is consciously processed at the time of coding. Denial can only be processed by the unconscious if the information has been consciously coded. Thus, if one wishes to make a decision in a context where very strict rules are presented, it is necessary to use conscious thought for a better decision (Dijksterhuis and Nordgren, 2006).

The principle of divergence and convergence shows that unconscious thought has an ability to process information in a more divergent way, which leads to more creative solutions. On the other hand, conscious thinking generates ideas in a much more focused and convergent way (Dijksterhuis and Meurs, 2006). This can be perceived as a creative insight that comes from a process in which there is an initial conscious reflection, that is, when the coding was done a priori, being followed by a period in which this problem is put to rest, presenting, after this period of time, deliberation without attention, a solution or idea. The process of creativity has long been associated with an incubation process. Ghiselin (1952) demonstrated that Nobel Prize-winners emphasize the process of incubation in their discoveries or creations, that is, the solutions do not arise through attention focused on the problem, but a period of distraction. The composer Peter Tchaikovsky stated that the embryo of a new composition always comes unexpectedly, after one performing another activity (Dijksterhuis and Nordgren, 2016). Similarly, the mathematician Henri Poincare only allowed himself to work four hours a day, certain that in the rest of his time his unconscious kept working and would at some point present a solution to the problem he was investigating (Dijksterhuis and Nordgren, 2016).

Although there is evidence of incubation, little is known about this process (Dijksterhuis et al., 2006). Studies proposed by Schooler and Melcher (1995) and Smith and Blankenship (1989) have shown that the process of incubation, that is, distraction, leads to a change of

mindset (in the form of thinking). However, these works did not explore the effect of unconscious thinking as a resource for creative solutions. Although a change in mindset may contribute to the creative process, it is unlikely that this is the only explanation for this process (Dijksterhuis et al., 2006).

2.2.2 UTT Empirical Applications: Method, Materials and Conditions

In order to test the UTT principles, Dijksterhuis and colleagues (Dijksterhuis, 2004; Dijksterhuis and Meurs, 2006) proposed some experimental procedures for the empirical application of this theory. The most important results from these studies are that the group under unconscious thinking produces better results for decisions under complex context than the group under conscious and immediate (i.e. control group) thinking. In studies on choice carried out by Dijksterhuis (2004), the unconscious group presents a greater probability of choice or is more favorable to the option that presents the highest number of positive attributes when compared to the conscious and immediate decision group. In their first two experiments, Dijksterhuis (2004) reported statistically significant differences between unconscious group versus conscious and immediate group (e.g. 59.3% in study 1 vs. 47.1% in study 2).

The experimental procedures were largely carried out in online laboratories by computational resources. To the participants, four alternatives were presented - such as apartments (Dijksterhuis, 2004; Nieuwenstein and van Rijn, 2012), cars (Dijksterhuis and Meurs, 2006), laptops (Hasford, 2014) or roommates (Ham and van den Bos, 2010; Strick, Dijksterhuis and van Baaren, 2010) - and these alternatives may be described in simple or complex context (i.e., multiple relevant features to consider; alternatives varying on each of these features). In the simple context, each alternative was compounded by 4 or fewer attributes and in the complex context each alternative was compounded by 6 or more attributes. These attributes were randomly assigned by a slideshow for 4 seconds each, in the center of the computer screen. In some studies, these presentations may vary between alternative and within attributes (e.g. Dijksterhuis and Nordgren, 2016).

These alternatives differ in terms of the number of positive and negative attributes (e.g. "there are many color choices" or "there are few color options", see, Dijksterhuis and Nordgren, 2006, for review). The alternative that has the best option has 75% positive and 25% negative

attributes, while the alternative that has the worst option has shown an opposite pattern. The other two alternatives are considered a filler and it has intermediate characteristics, with 50% of positive and 50% negative attributes, in a way to balance valence attributes among alternatives.

After participants encode all alternatives attributes, they were random assigned to one of the three processing modes (conscious, unconscious or immediate). In the immediate thought condition, participants were invited to immediately choose the best option among the four alternatives. In the conscious thought conditions, participants were invited to reflect about each option - "You should think carefully about the options presented" (Dijksterhuis, 2004, p. 589) - around 3 or 4 minutes and then they are invited to choose the best option. In the unconscious thought condition, participants were invited to make a decision after they have done a distracted task for 3 or 4 minutes. This distraction tasks may vary according to the literature as, N-back (Bos and Dijksterhuis, 2011; Dijksterhuis and Meurs, 2006), anagrams (Strick, Dijksterhuis and van Baaren, 2010), word-search (Bos and Dijksterhuis, 2011; Nieuwenstein and Rijn, 2012) and so on. An essential component for activation of the unconscious is to distract attention of the participant to some irrelevant task that occupies the participant's working memory during a set of a period.

Over the last 10 years, several researchers have tested the principles of UTT and its methodological postulates (Dijksterhuis and Strick, 2016). Despite its empirical successes and its advanced conceptual development, UTT has received critics (Bargh, 2011). Over this period, criticisms are based on the validity of its theoretical principles, in the form of its methodological composition and the empirical replication of its findings. Several studies has been tested different procedures, such as different presentation sequence on alternatives and attributes (González-Vallejo et al, 2014), different kind of attributes (Wang et al., 2015), complexity levels (Dijksterhuis and Nordgren, 2006; Lerouge, 2009; Ham and Bos, 2011; Newell and Rakow, 2011), presentations time (Payne et al., 2008), deliberations time (Payne et al., 2008) manipulation of deliberation (Dijksterhuis and Nordgren, 2006; Acker, 2008; Lerouge, 2009), distraction task (Nieuwestein et al., 2015), dependent variables (Dijksterhuis and Nordgren, 2006; Smith, Dijksterhuis and Wigboldus, 2008, De Vries et al., 2010) and so on. Furthermore, potential moderators have been identified as a configural versus featural processing (Lerouge, 2009), self-paced decision making (Payne et al., 2008) and types of task distractor. (Acker, 2008). All of theses studies sought to replicate the UTT findings, in some cases confirming the

results found by Dijksterhuis and Nordgren (2006), potential moderators and, in other cases, finding divergent results.

The great claim on the part of researchers who tried to replicate the results of the UTT is in relation to its validity, it is criticized for several reasons. For example, Shanks (2006) show that the effect is not because there is a superior performance of the unconscious group, but may in some way be linked to some impairment in the performance of the conscious group due to impairment in the recovery of simple memory. In addition, some replications failed to confirm the original effects (Acker, 2008; Newell et al., 2009; Rey, Goldstein and Perruchet, 2009; Withrow and Thorsteinson, 2009). The replication of Payne et al. (2008) allowed participants of the unconscious group to deliberate as much as they thought necessary, that is, the participants were not given a set time. It led the conscious group to make decisions as good and sometimes better, as the unconscious group. Gonzales-Vallejo et al. (2008) criticize UTT for being incompatible with the findings of social and cognitive psychology and presented evidence that there may be problems in the methodology proposed by Dijksterhuis (2006). Withrow and Thorsteinson (2009) argued that the difficulty of replicating the effect may be behind having results only under specific conditions. Another criticism, raised by Bekker (2006), refers to the limited sample size. The meta-analysis performed by Nieuwenstein et al. (2015) indicated that previous results supporting the validity of UTT were restricted to studies using relatively small samples of participants. In addition to these criticisms, Acker (2008) pointed out in his meta-analysis that the data were almost exclusively from a single laboratory, showing a possible bias.

Although some studies have replication problems, that have used very similar methods and materials (Acker, 2008; Calvillo and Penaloza, 2009; Newell et al, 2009; Rey, Goldstein and Perruchet, 2009), further studies carried out in the following years by researchers associated with other laboratories have reported successful replications, as well as generalizations in other domains (Ham et al., 2009; Ham and Van den Bos, 2010). For example, neuroscientific studies using functional magnetic resonance imaging (fMRI) performed by Creswell, Bursley and Satpute (2013) showed that the same regions activated during the information coding period (to the right of the dorsolateral prefrontal cortex and to the left of the visual cortex) remained activated for a subsequent period of 2 minutes during deliberation-without-attention. In addition, neural reactivation in these regions was predictive of subsequent performance for behavioral decision making after the period of unconscious thinking. These results provide initial evidence of neural post-coding and a reactivation of the unconscious in order to facilitate decision making, thus demonstrating that brief periods of unconscious thinking are superior in

decision-making compared to a decision made immediately (Creswell, Bursley and Satpute, 2013).

Despite the apparent miscellany of effects presented by several studies that attempted to replicate UTT's assumptions (Shanks, 2006), meta-analytical studies have demonstrated empirical advantages of unconscious thinking over conscious and immediate decisions when dealing with complex tasks (see, Strick et al., 2009, Acker, 2008). These implications are important for decision-making and complex choices (Bargh, 2011). Bargh (2011) in a review using UTT studies, has strongly criticized the criticisms the negatives judgments presented about the theory, demonstrating that the published failures to replicate the theory are, in fact, a problem of UTT, but way research conduct their studies. Thus, Bargh (2011) concludes that all researchers should have an open mind about the potential contributions of both unconscious and conscious processes in decision making that involves information complexity.

2.3 CHOICE AND REJECTION STRATEGY

When consumers choose among a set of alternatives, they can employ two distinct decision strategies. First, the choice strategy, when the choice is based on the best alternative, usually, from positive features (Nagpal, Lei and Khare, 2015). Second, the rejection strategy, when the decision occurs through the elimination of options, leading to the best alternative (Meloy and Russo, 2004). Previous studies have identified that the conscious choice strategy has the main objective of searching for an option that is pleasant (Laran and Wilcox, 2011; Sela and Berger, 2012). However, when the task is performed by eliminating options (i.e., rejection), individuals seek to identify the alternative that has the least number of negative aspects. It demonstrates that, depending on the strategy (choice or rejection), the decision maker may achieve different results, even though the same set of alternatives is considered (Mourali and Nagpal, 2013).

The decision-making literature has been showing that consumers using different strategies to make a decision in situations when alternatives have multi-attributes, such as WADD (Tversky and Kahneman, 1986), lexicographic strategy (Bettman et al., 1998), satisfaction strategy (Simon, 1955), tend to be more satisfied with their choices. However, these strategies focus on selecting the best option, rather than rejecting the less attractive ones. Another strategy widely used for decision making is Heuristics (Tversky and Kahneman, 1974),

in which the basic rule used is "choosing the best and ignoring the rest", which has as the main principle a non-compensatory rule. In Heuristic strategy the decision is based on only one or certain characteristics (Gigerenzer and Goldstein 1996; Todd and Gigerenzer, 2001; Newell and Shanks 2003) and not on a general overview of the features (Dijksterhuis, 2004; Dijksterhuis et al., 2006).

On the one hand, the literature about choosing the best alternative has been describing in rich details, through several strategies (Dhar and Wertenbroch, 2000; Shafir, 1993; Park, Jun and MacInnis, 2000). It is possible to observe the existence of strategies based on rejection for multi-attribute decision, as well as the Conjunctive Strategy (Einhorn, 1970), in which a threshold value is determined for attributes and when those attributes do not reach the imposed limit they are rejected. Besides there are also other strategies as: Elimination by aspects (Tversky, 1972), Preference Trees (Tversky and Sattath, 1979), Elimination by Cut-off (Manrai and Sinha, 1989), and Elimination by Dimensions (Gensch and Ghose, 1992). Although these strategies are used for decision making in rejection tasks, they could also be used for the choice strategy, since the goal is to reach a minimum limit on each attribute. In a way, these decision strategies are focused of a conscious process, in which the consumer must weigh each option and features in order to reach the best option.

Decision strategies has important consequences for the type of product chosen (Dhar and Wertenbroch, 2000; Shafir, 1993), the number of products chosen (Huber, Neale and Northcraft, 1987; Levin, et al., 2002; Park, Jun and MacInnis, 2000), and for the certainty of a decision (Payne, 1976; Yaniv and Schul, 1997). However, previous research has identified different and divergent outcomes between choice and rejection strategies (Mourali and Nagpal, 2013, Chen and Proctor, 2017).

According to Mourali and Nagpal (2013) the literature on decision strategy may be organized on three different approaches. In the first, researchers try to understand if when consumers use a choice or rejection strategy to make a decision in a set of options leads to a difference in the final number of product options. The previous literature has indicated a robust effect of selecting versus rejecting. In a choice strategy, consumers tend to selects a smaller amount of option, while in rejection strategy they tend to choose more option (Huber et al., 1987; Park et al., 2000; Yaniv and Schul, 1997). For example, Huber et al. (1987), showed that recruiters select more candidates to do a job interview when they are asked which candidates they would reject in relation to when they are asked which candidates they would choose (Yaniv and Schul, 2000; Yaniv et al., 2002). Goodman and Naylor (2014) have find that most

consumers prefer to use a rejection strategy when choosing from a small assortment, and consumers are more likely to use a choice strategy as the assortment size increases. In opposite direction, Park, Jun, and McInnis (2000) have shown that consumers facing a large set of choices, when using choice tasks, tend to take over a smaller arrangement than when they are under a rejection task.

In the second approach, it is supported that people look for different types of information when they choose versus reject (Ganzach, 1995; Shafir, 1993; Wedell, 1997). In this case, researchers focus to understanding on whether decision makers look for reasons to reject and to select, specifically when consumers are given binary choices with different kind of attributes. In general, these alternatives are composed by attributes which have positive and negative valence. Shafir (1993) proposed that alternatives with positive valence are more weighted when choice is applied, whereas the negative valence is more weighted when rejecting an option. However, the same option can be both chosen and rejected more often. It happens because a positive alternative provides more reasons for choice as well as more reasons for rejection in a negative alternative (Ganzach, 1995; Shafir, 1993; Wedell, 1997). Using a functional magnetic resonance imaging (fMRI), Foo, Haji and Sakai (2014), showed that the same decision circuits within the prefrontal cortex are configured differently, depending on whether decisions are made, based on preferential or non-preferred criteria. In addition Dijksterhuis (2004) presented, in his study a list of possible roommates with several desirable and undesirable characteristics to participants. Then, after participants decided which of these options they prefer, they tended to remember the desirable (positive) characteristics of the chosen roommate and the undesirable (negative) characteristics of the rejected roommates.

The third approach, identifies processing differences between selecting and rejecting (Mourali and Nagpal, 2013). Meloy and Russo (2004) suggest that people have a stronger need to justify selection in relation to rejection. Wedell (1997) extended the findings of Ganzach (1995) and Shafir (1993), showing that consumers, when they are under choice strategy, seek reasons to choose, and when they are under rejection strategy they look for reasons to reject. Thus, consumers look at the same set of products under different aspects, which can lead them to different decisions. Ganzach (1995) has shown that consumers treat choice strategy as more important than a rejection strategy.

Although literature has shown that research on choice strategy is widespread and widely researched in rejection strategy, these findings are still poorly explored (Laran and Wilcox, 2011), since a few studies have been concerned about analyzing this type of task (Dhar and

Wertenbroch, 2000; Meloy and Russo, 2004; Chernev, 2009, Irwin and Naylor, 2009; Krishnamurthy and Prokopec, 2010; Laran and Wilcox, 2011; Sokolova and Krishna, 2016). Krishnamurthy and Prokopec (2010) revealed that a rejection task leads to greater satisfaction when a mental provision is not present. Dhar and Wertenbroch (2000) propose that rejection tasks increase in detail on hedonic attributes, resulting in a greater hedonic preference over more utilitarian alternatives. Studies proposed by both Laran and Wilcox (2011) and Sokolova and Krishna (2016) demonstrate that consumers spend more time to decide what is the best option in a rejection than in a choice strategy. They have demonstrated that decision-makers need greater emotional and cognitive ability to make decisions on rejection tasks (Laran and Wilcox, 2011), due to the limitation of the information processing capacity at the moment of decision making (Dijksterhuis and Nordgren, 2006). These findings corroborate with the meta-analytic study of Scheibehenne, Greifeneder and Todd (2010), which found zero effect for complex choices in conscious decision-making. Based in this outcomes, we predict that the processing mode can modify the effect on the choice or rejection strategy depending on the set size.

2.4 HEDONIC VERSUS UTILITARIAN ATTRIBUTES AND DECISION STRATEGIES

Several studies on judgment and decision making have long recognized that individuals are influenced, differently, in their decisions by products that have hedonic and utilitarian nature (Batra and Ahtola, 1991; Dhar and Wertenbroch, 2000; Nagpal, Lei and Khare, 2015). The literature about hedonic and utilitarian attributes have provided different perspectives, since the seminal study of Tauber (1972). This author suggests that consumers are motivated by a variety of psychosocial needs related to the acquisition of products. Based on these psychosocial desires, researchers have made a conceptual distinction between behavior based on utilitarian and hedonic features (Lofman, 1991).

Batra and Athola (1991) have shown that consumption occurs for two fundamental reasons. The first reason is linked to the pursuit of affective gratification; and the second reason is the search by consumers for more functional characteristics in the products. The first reason describes sensorial and hedonic attributes, and the second describes utilitarian and non-sensory

attributes. These two reasons are ways that affect attitudes toward different product categories (Batra and Athola, 1991).

In the same vein, Voss, Spangenberg and Grohmann (2003) affirmed that the hedonic dimension is related to sensations of the use of products and utilitarian dimension is about the functions of the products. Chitturi, Raghunathan and Mahajan (2008) also observed utilitarian attributes as practical, functional and instrumental benefits, and hedonic attributes as enjoyable, experiential, and aesthetic. Hedonic attributes are more related to experiential decisions, related to pleasure, aesthetics and a more symbolic perspective. On the other hand, products that present more utilitarian characteristics have their decision more involved with the experience of the use and the function of the product (Holbrook and Hirschman, 1982). Hedonic attributes are more subjective, being linked to fun and playfulness, which reflects in the consumer a potential entertainment and emotional value, allowing a consumer to enjoy the benefits of the product even without buying it (Groeppe-Klein, Thelen and Antretter, 1999). Utilitarian and hedonic consumption are discretionary and its difference is about a of matter perception (Okada, 2005). Products may be high or low in both attributes at the same time (Khan, Dhar and Wertenbroch, 2005).

Besides these dimensions – hedonic and utilitarian – present different characteristics, the literature about decision strategies has shown that there is an interaction between the product characteristics and the nature of the task (Dhar and Wertenbroch, 2000; Yaniv et al., 2002; Nagpal, Lei and Khare, 2015). These studies have demonstrated, in an approach more rational, that hedonic attributes are most used for rejection strategies, while utilitarian attributes are commonly used in a choice strategy (Nagpal, Lei and Khare, 2015; Dhar and Wertenbroch, 2000). Dhar and Wertenbroch (2000, p. 2) show that “asymmetry in preferences due to the manipulation of the reference option can also be expressed in terms of differential loss aversion for hedonic and utilitarian attributes”.

Dhar and Wertenbroch (2000) suggest that consumers when using rejection strategies have more spontaneous pre-factual thinking, since they seek to elaborate on possible future outcomes before their decision. This process of elaboration should increase the relevance of attributes that are more sensorial and easily imaginable (Shiv and Huber, 2000), which in a way can induce more negative emotions (Nagpal, Lei and Khare, 2015).

In an opposite direction, when consumers use a choice strategy, they tend to focus attention on utilitarian attributes that provide cognitive and instrumental functions (Dhar and Wertenbroch, 2000; Shafir, Simonson and Tversky 1993). Products with more utilitarian

characteristics make the final decision easier, since this option is simpler to justify than the choice for a dominant hedonic option (Okada, 2005). Therefore, consumers are likely to focus attention on utilitarian attributes and choose the option that is superior in such attributes in a choice strategy (Nagpal, Lei and Khare, 2015; Dhar and Wertenbroch, 2000), as it becomes easier to consumer to rationalize this decision. Products that present more utilitarian characteristics have their decision more related to experience of the use and function of the product (Holbrook and Hirschman, 1982). Laran and Wilcox (2011) found that people prefer the indulgent (hedonic) alternative in a choice task and the relatively less indulgent (utilitarian) alternatives in a rejection strategy. More importantly, their results indicate 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.

Sela, Berger and Liu (2009) show that healthier or utilitarian options tend to be easier to justify in general, due to the situational factors that can provide accessible justifications to indulgency. Alternatively, they propose that the choosing from larger assortments has the opposite effect, increasing the share of vices or hedonic choices. Years later, Sela and Berger (2012) demonstrated that attribute quantity benefits hedonic more than utilitarian options by increasing the extent to which the former appears useful. They show that increasing attribute quantity equally, across the choice set, shifts choice toward hedonic options, regardless of whether the attributes are hedonic, utilitarian, or mixed in nature. These effects become amplified when decision makers engage in heuristic processing. Alternatively, past studies that have focused on the quantity of items selected under choosing versus rejecting, Nagpal, Lei and Khare (2015) examine the effect on the quality of the decision, namely the relative number of healthy versus unhealthy items. In a series of studies on consumers' food customization, they show that decision strategy (choice or rejection) influence the relative number of healthy (utilitarian) versus unhealthy (hedonic) items included in the customized food.

Wang and colleges (2015) through two experiments studies show that hedonic information looms relatively larger than utilitarian information when individuals are distracted compared to when they engage in deliberative thinking. Babin, Darden and Griffin (1994) suggest that the search for products with utilitarian characteristics is linked to some kind of conscious search that has an intentional consequence. In the case of products with utilitarian features, the consumer perceives the value only if the shopping task is completed successfully

and, better still, if it is meticulous (Babin, Darden and Griffin, 1994, p. 646). In their research, Spangenberg, Voss and Crowley (1997, p. 265) suggest that in choice strategy "hedonic attributes are experienced at both the affective and cognitive levels, while the utilitarian attributes, that may also include both affective and cognitive dimensions, yet are dominated by more cognitive elements". Dijksterhuis and Nordgren (2006, p.107) argue that the superior performance of a decision through unconscious thought can be because "the unconscious somehow uses hedonic information better than conscious thinking". It is important to take into account, as Batra and Athola (1991) have argued, that utilitarian and hedonic motivations are not mutually exclusive. Hedonic and utilitarian dimensions can be challenging due to a large number of characteristics and contexts (Babin, Darden and Griffin, 1994). There are times when it is necessary for consumers to be both rational and emotional in a particular buying situation. Based on these information, we propose an interaction relationship among hedonic and utilitarian attributes and choice and rejection strategy under different sets and that this relationship has an opposite effect depending on the processing mode.

2.5 DISTRACTION TASKS AND BOUNDARIES CONDITIONS

As previously shown, several protocols have been developed to evoke conscious or unconscious thought (Acker, 2008; Nieuwenstein et al., 2015; Dijksterhuis and Nordgren, 2016). In order to evoke unconscious thought, individuals are distracted for some minutes (Dijksterhuis and van Olden, 2006). However, this distraction task is shown as a promising candidate to a moderator in the literature (Acker, 2008; Nieuwenstein et al., 2015), and was little explored in empirical studies (Acker, 2008). For instance, Acker (2008) in a meta-analytical study has found that in a distraction task the word search puzzles ($g = .436$) produced larger effect sizes than n -back tasks ($g = .275$) and anagrams ($g = .138$). Another important consideration is that the effect sizes became significantly larger with decreasing unconscious thought intervals time ($\beta = -.104$; $Z = -2.94$; $p < .01$). In others words, the type of distractor and time distraction may be potential moderators to unconscious thought.

Meanwhile, research suggests that as a task becomes increasingly difficult, a rejection strategy will be more preferred (Heller, Levin and Goransson, 2002). This result is consistent with the research on decision avoidance (Iyengar and Lepper, 2000). As a consequence, a

choice strategy that involves difficult trade-offs may tend to be resolved with a rejection decision strategy. Furthermore, when customer have no prior knowledge about the alternatives presented, they may have difficulty to make a choice and than band to a rejection strategy (Machin, 2016).

In the same vein, Laran and Wilcox (2011) have found that people prefer the indulgent alternative in a choice task and the relatively less indulgent alternative in a rejection task. More importantly, their results indicate (in their study 4) that cognitive load affects rejection more than choice, they speculate, that when a decision task becomes extremely difficult, people protect themselves from this difficulty by going back to their baseline preference. 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.

Vosgerau and colleague (2008), have show that depletion and cognitive load produced similar effects, supporting the claim that depletion-effects are not limited to self-control. The author's explanation is that depletion could be overcoming by influencing people's beliefs, whereas cognitive load could not influence, suggesting that depletion and cognitive load do represent two different processes. Researches have demonstrated that depletion may happen for many reason such as: thought suppression (Muraven, Tice, and Baumeister, 1998), response inhibition (Wallace and Baumeister, 2002), intellectual performance (Schmeichel, Vohs, and Baumeister, 2003), active choice-making (Bruyneel, Dewitte, Vohs, and Warlop, 2006) and persistence at strenuous tasks (Baumeister et al., 1998). "The theory of ego depletion states that all acts of self-control draw on a common limited resource that is akin to energy or strength" (Vosgerau et al., 2008, p. 217). It refers to a lagged or hang-over type of effect, due to prior self-regulatory efforts, whereas cognitive load refers to a concurrent effect, due to concurrent cognitive processing (Marenges et al., 2017). Baumeister (1998) has shown that acts of choice and self-control would cause ego depletion for subsequence decision. Prior decisions might influence subsequent preferences, based on mental or actual resource depletion. The extent to which the first choice depletes a person's limits self-control resources and might make it more difficult to subsequently resist a tempting option (Muraven and Baumeister, 2000). While individuals under cognitive load fewer processing resources are available for other information (Marenges et al., 2017).

Khan and Dhar (2006) have found that individuals may be able to adjust how they frame decisions according to their baseline preference. For example, after a good workout, when

people are tired or depleted, they feel licensed to do an indulgent choice. Laran and Janiszewski (2010) showed that when individuals interpret tasks as a job they are more likely to deplete resources. That is after individuals undertake activities they conceptualize as a work obligation, their capacity to complete subsequent tasks that demand self-control diminishes. Alternatively, tasks that are interpreted by individuals as fun do not tend to deplete resources. Indeed, after individual's complete activities they conceptualize as fun, their capacity to undertake subsequent tasks that demand self-control improves. Based on these previous arguments we propose that the mental depletion resource can also influence preference for different choices under unconscious thought as happens in a conscious decision. Besides, we believed that, in terms of cognitive load, if attentional resources are not necessary for unconscious thought, then cognitive load would not affect the memory of the attributes.

3 STUDIES OVERVIEW

To test our main proposition of “how the (un)conscious processing of hedonic and utilitarian attributes affect the choice and rejection strategy under different levels of complexity in multiattribute decision making” and boundaries conditions, we have carried out 3 experimental studies, it was demonstrating that the way a decision is elaborated, conscious or unconscious (Wilson and Schooler, 1991; Dijksterhuis et al., 2006) can change results in a choice or rejection strategy. At the same time, it was identifying that the type of strategy (choice vs. rejection) used leads to a final decision on products with different characteristics (hedonic vs. utilitarian). Specifically, study show a boundary condition when hedonic and utilitarian attributes are processed in a complex set under unconscious thought, as well as individuals in this condition may suffer a deviation in their preferences due to the characteristics of the distraction task. When individuals perform a tasks that consumes a lot of mental energy, it could affect the capacity to complete subsequent tasks. However, when information processing is made unconsciously, the effect happens when individuals are depleted, but does not occur when they are under cognitive loading.

Study 1, demonstrates that consumers make different decisions depending on the complexity of the alternative set. It was manipulated the size of set and demonstrated unconscious and conscious processes take different decisions depending on the strategy decision. In study 2, shows that cognitive constraints make people less likely to engage in deliberative (conscious) processing. It was manipulated work memory load (high vs. low) and shows that cognitive load does not influence the strategies of choice and rejection. Through study 3, shows a direct evidence of the mechanism underlying the effect of type of distraction tasks. When participants perform ego depletion task during distraction time they are affected in their subsequent decisions. The results had demonstrated that participants on choice strategy become similar to rejection strategy when they are cognitively depleted. At the end, it was performed single-paper meta-analysis confirm that our studies 1 and 3 (unmoderated set) support our theoretical framework. A meta-analysis of the main effect of choice and rejection on unconscious thought and demonstrated that main effect is consistent and replicated through the studies.

3.1 STUDY 1 – INFORMATION PROCESSING MODE AND DECISION STRATEGY IN DECISION SETTINGS OF VARYING COMPLEXITY

Study 1 was to test how (un)conscious processing of hedonic and utilitarian attributes effects choice and rejection strategy under different levels of complexity. We have used a modified version of the scenario used by Dhar and Wertenbroch (2000) in simple set and Wang et al. (2015) in complex set of information, in which people had to choose (reject) among four apartment options with different hedonic and utilitarian features. Prior research in decision strategies and attribute types, have demonstrated that consumers under deliberation (conscious) processes, hedonic attributes are most used for rejection strategies, while utilitarian attributes are most commonly used in a choice strategy under simple context (Dhar and Wertenbroch, 2000). However, research about choice in complex context, has shown a divergent result (Sela and Berger, 2012; Scheibehenne, Greifeneder and Todd, 2010). We have confirmed previous results and have tested our preposition showing that results are reversed when consumers need to decide among complex set alternatives and features (Wang et al., 2015) when elaborated through a process of deliberation-without-attention (unconscious).

3.1.1 Design and participants

Participants from Mechanical Turk¹ were invited by Amazon to answer an online survey for 12 minutes in exchange for .68 US dollars. The study adopted a full factorial design 2 (information complexity: simple vs. complex) x 2 (processing mode: conscious vs. unconscious) x 2 (decision strategy: choice vs. rejection) between-subjects.

3.1.2 Procedures and stimuli

Before starting any of the study, participants were presented a consent form in on line version explain the research, after they accept the term they could start the research (see,

¹ Mechanical Turk was introduced by Amazon in 2005 as a “marketplace for work that requires human intelligence” (www.mturk.com), pairing together “requesters” and “workers” for short-term tasks, for details see Rouse (2015) and Goodman and Paolacci (2017).

Appendix A). Afterward, participants were informed that they would form general impression about four different apartments (A-D) for rent (see the experiment flow on appendix B). Six sets of attributes of four fictitious apartments' attributes were used as complex context. Each apartment was composed of three hedonic and three utilitarian attributes. According to the scenario proposed by Wang et al. (2015), these attributes had different valences (see table 2). Apartments A and C were used as a filler to increase the overload information effect. Their attributes and valences were counterbalanced 50% hedonic and 50% utilitarian. The apartment B (Hedonic option) had 50% of the high valence on hedonic attributes and 50% of low valence on the utilitarian attributes. The same was applied to apartment D (Utilitarian option), but in the opposite way (see appendix C).

The other four sets were created for simple context, containing two attributes per apartment, one hedonic and another utilitarian. According to the scenario proposed by Dhar and Wertenbroch (2000). The apartment B (Hedonic option) had one attribute of the high valence on hedonic (Park view) and another with low valence on the utilitarian attributes (Relatively far) and the apartment D (Utilitarian option) had one attribute of the low valence on hedonic (Parking lot) and another with high valence on the utilitarian attributes (Relatively close). The apartments A and C were used as filler (see Table 2).

Table 2 - Apartments attributes and valence

	Hedonic Attributes			Utilitarian Attributes		
	Residential landscaping	View from the Apartment [†]	Landlord	Rent for the Apartment	Distance to work or study [†]	Network signal
Apartment "A"*	Pleasant	Park	Unkind	Relatively expensive	Relatively close	Poor
Apartment "B"***	Pleasant	Park	Kind	Relatively expensive	Relatively far	Poor
Apartment "C"*	Unpleasant	Parking lot	Kind	Relatively cheap	Relatively far	Strong
Apartment "D"***	Unpleasant	Parking lot	Unkind	Relatively cheap	Relatively close	Strong

Note: * Apartment "A" and "C" filler options; **Apartment "B" has high hedonic attributes; *** Apartment "D" has high utilitarian attributes; † apartment's attributes used in the simple context.

Source: Wang et al. (2015).

Participants were randomly assigned to one of the two conditions of complex and simple context of the four hypothetical apartments (A, B, C and D). This information was randomized between and within apartment. Each attribute was presented in random order, one by one, for four seconds each. In complex context condition, participants were presented to 6 attributes for

each apartment and in simple context condition, they were presented to 2 attributes for each apartment.

Immediately, each participant was randomly assigned to one of two conditions of conscious and unconscious processing mode. In deliberation condition (conscious), participants were presented to the following information: “You will later be asked for your opinion about the apartments. Now, you have four minutes to write about each apartment”. Then the following information was presented “Now, think very carefully about what you think of each of the four apartments and write down the advantages and disadvantages of the apartments”. For this task participants were asked to write at least one hundred characters. During the task a timer was shown with the remaining time.

In the deliberation-without-attention condition (unconscious), the participants were presented to the following information: “You will later be asked for your opinion about the apartments, but now you have four minutes to complete a memory task”. Then they were presented to the instructions needed to complete the memory task. The task was composed of a word-search puzzle in array of 10 x 10 letters. Each word was shown together with a number from 00 to 99. Participants needed to find target words. The words were composed by the name of five different countries (Germany, France, Japan, Canada, Italy); five vegetables (lettuce, potato, carrot, onion, tomato); and five fruits (orange, lemon, melon, grape, apple), see appendix D. The words could be written in any direction (horizontal, vertical and diagonal). The task was adapted from Nieuwenstein et al. (2015). This task should be performed in four minutes and during the task, a timer was shown with the remaining time.

Thereafter, participants were randomly assigned in one of two conditions of choice and rejection. In choice condition, participants received the following information: “Apartments "A" and "C" have already been rented. Thus, if you had to choose between apartments "B" and "D", which one would you choose to rent?”, through a 7-point trade-off decision scale from “-3 definitely choose apartment B” to “+3 definitely choose apartment D”. In rejection condition, participants received the following information: “Apartments "A" and "C" have already been rented. Thus, if you had to reject between apartments "B" and "D" to rent, which one would you reject to rent?”, and the same scale was applied (“-3 definitely reject apartment B” to “+3 definitely reject apartment D”) as the dependent variable.

In addition, participants answered two different questions considered as attention checks. First was requested after the dependent variable, with the following statement: “Please, list below all your thoughts while reading the situation and that had influenced in your answer”.

Second, it was found that respondents were reading all instructions given by the survey. The question was a multiple choice, with the following statement: “When you are choosing an apartment to rent, what are the attributes that most call your attention? Actually, we would like to know if you are reading all the instructions given and paying enough attention. So, please, select the "others" option and write apartment”. Seven options were presented (price, place, view, security, distance, utilities) besides the option “others” (Oppenheimer, Mevis and Davidenko, 2009). Next, as a manipulation check we have requested participants to indicate how difficult was the task in a 11-point scale anchored on “0 - not too much” on the left and “10 - very much” on the right. At the end, participants answered some questions about demographic variables and they were debriefed, thanked for their participation, and given a code to redeem compensation through Amazon Mechanical Turk.

3.1.3 Results

Four hundred and twenty-eight participants were recruited from Mechanical Turk. Thirty participants failed in the attention check. The final sample include three hundred and ninety-eight participants (240 women; $M_{age} = 38.96$; $SD_{age} = 12.34$). The study adopted an ANOVA full factorial design 2 (information complexity: simple vs. complex) x 2 (processing mode: conscious vs. unconscious) x 2 (decision strategy: choice vs. rejection) between-subjects.

3.1.4 Task Difficulty

We performed a three-way ANOVA, when the dependent variable was the task difficulty perception. There was not a three-way interaction of these factors ($F(1,390) < 1.0, p = n.s.$). We have revealed a two-way interaction between processing mode and decision strategy ($F(1,390) = 5.351, p = .021, Cohen's d = .23$).

In the conscious processing condition, participants in choice strategy presented lower task difficulty perception than in the rejection strategy condition ($M_{choice} = 3.78$ and $M_{rejection} = 4.61, F(1,390) = 3.964, p = .047, Cohen's d = .20$). In the unconscious processing condition, choice ($M_{choice} = 4.45$) and rejection strategy ($M_{rejection} = 3.90, F(1,390) = 1.645, p = .200, Cohen's d = .13$) did not show any significant difference. The rejection strategy was revealed a

marginal significant difference between conscious and unconscious processing ($F(1,390) = 2.80, p < .10, \text{Cohen's } d = .17$) and did not show significant difference for the rejection strategy ($F(1,390) = 2.55, p > 1.0, \text{Cohen's } d = .16$). At the end, context information showed a significantly main effect. Participants in simple condition had less task difficulty perception than in the complex condition ($M_{\text{simple}} = 3.72$ and $M_{\text{complex}} = 4.67, F(1,390) = 10.62, p < .001, \text{Cohen's } d = .33$). This shows that, when the attributes increase in terms of quantity, the participants perceive higher difficulty to perform the task than when the quantity of attributes is low.

3.1.5 Decision strategy

To analyze the effect of the information complexity, of the processing mode and the decision strategy on the trade-off decision, a three-way an Analysis of variance (ANOVA) was performed. The dependent variable (trade-off decision) was measured through a 7 points-scale (-3 definitely apartment B "hedonic" and +3 definitely apartment D "utilitarian"). The context (simple vs. complex), processing mode (conscious vs. unconscious), decision strategy (choice vs. rejection) and interaction were considered as independent variables. Participants who received the rejection stimulus as a dependent variable had their score reversed, once the goal was to analyze the final choice.

The ANOVA has revealed a significant three-way interaction of these factors ($F(1,390) = 11.83, p < .001, \text{Cohen's } d = .34$), see Table 3. There was a significant processing mode by decision strategy interaction in the simple context condition ($F(1,390) = 6.51, p < .05, \text{Cohen's } d = .25$). In the condition of conscious processing, choice strategy has predominated in the decision for apartment "D" with the most utilitarian features ($M_{\text{utilitarian}} = .67, SD = 2.41$). In rejection strategy decision for the apartment "B" with the most hedonic features has predominated ($M_{\text{hedonic}} = -1.00, SD = 2.25, F(1,390) = 12.19, p < .001, \text{Cohen's } d = .35$).

For the unconscious processing condition, choice and rejection strategy ($M_{\text{choice}} = .34, SD = 2.40, M_{\text{rejection}} = .35, SD = 2.29$) have predominant on the apartment "D" with the most utilitarian features and they did not revealed significant effect ($F(1,390) < 1.0, p = n.s$). The rejection strategy had presented a significant difference between conscious and unconscious

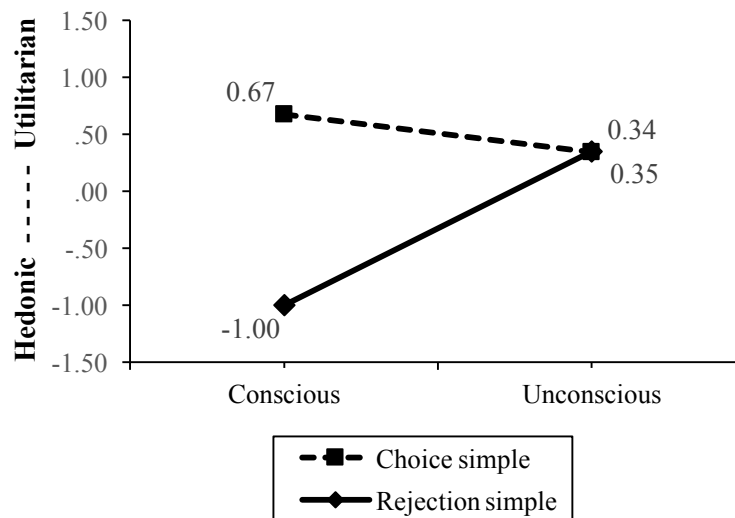
processing ($F(1,390) = 7.97, p < .01, \text{Cohen's } d = .29$) and did not reveal significant effect for choice strategy ($F(1,390) < 1.0, p = n.s.$), see Figure 1.

Table 3 - Three-way ANOVA between-subject

Dependent Variable: Trade-off decision					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	124.239 ^a	7	17.748	3.366	.002
Intercept	.169	1	.169	.032	.858
Complexity	4.861	1	4.861	.922	.338
Thought	9.007	1	9.007	1.708	.192
Strategy	43.548	1	43.548	8.259	.004
Complexity*Process	4.073	1	4.073	.773	.380
Complexity*Strategy	2.711	1	2.711	.514	.474
Process*Strategy	.200	1	.200	.038	.846
Complexity*Process*Strategy	62.386	1	62.386	11.832	.001
Error	2056.336	390	5.273		
Total	2181	398			
Corrected Total	2180.575	397			

a. R Squared = .057 (Adjusted R Squared = .040)

Figure 1 - Interaction effect of simple context

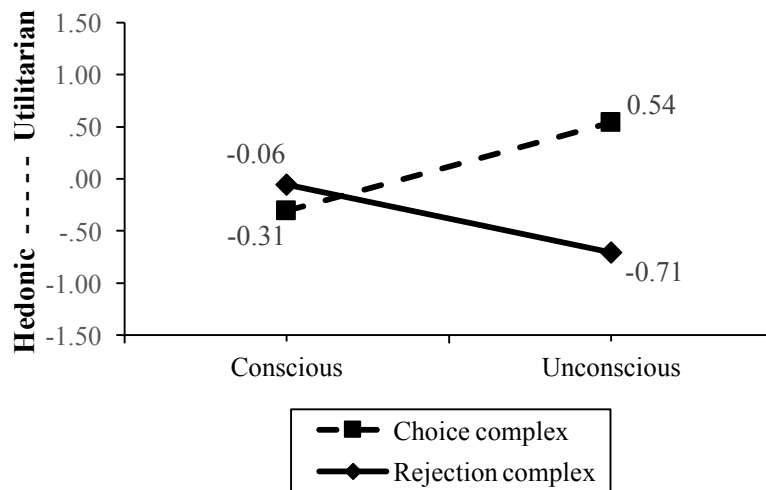


Source: Author

There was a significant interaction between processing mode and decision strategy in the complex set ($F(1,390) = 5.34, p < .05, \text{Cohen's } d = .23$). In the condition of conscious processing, the choice and rejection strategy have predominated on decision for apartment "B" with the most hedonic features ($M_{choice} = -.31, SD = 2.26, M_{rejection} = -.06, SD = 2.25$) and they did not reveal significant difference ($F(1,390) < 1.0, p = n.s.$), see Figure 2.

In the unconscious processing condition, choice strategy was predominant on the apartment "D" with the most utilitarian feature ($M_{utilitarian} = .54$, $SD = 2.17$) and in rejection strategy has predominated on decision for the apartment "B" with the most hedonic features ($M_{hedonic} = -.71$, $SD = 2.29$, $F(1,390) = 6.89$, $p < .001$, $Cohen's d = .27$). Choice strategy has revealed a marginal significant difference between conscious and unconscious process ($F(1,390) = 3.35$, $p < .10$, $Cohen's d = .18$) and did not reveal significant difference for the rejection strategy ($F(1,390) < 1.0$, $p = n.s.$).

Figure 2 - Interaction effect of complex context



Source: Author

3.1.6 Discussion

Study 1 results showed that consumers produce different decisions depending on the processing mode under different size sets. In a small set, we reproduce the same result as Dhar and Wertenbroch (2000) demonstrating that hedonic attributes are most used for rejection strategy, while utilitarian attributes are most commonly used in choice strategy (Nagpal, Lei and Khare, 2015; Dhar and Wertenbroch, 2000). We also confirm the proposition of unconscious thought theory that shows that in a small set, the consumers have low performance in unconscious than conscious processing (Dijksterhuis and Nordgren, 2006). In other words, when individual process less information, conscious mode of processing makes a trade-off due

to the type of strategy, while in unconscious processing mode there is a bias leading individuals to choose utilitarian alternatives.

In complexity sets, we have shown reversed results, as consumers need to decide among a great set of alternatives and features (Wang et al., 2015; Dijksterhuis and Nordgren, 2006). Participants who engage in a conscious process under a complex set, in choice or rejection decision, were more likely to choose more hedonic than utilitarian attributes alternatives, confirming the result of Sela and Berger (2012). These authors have noted that, when participants had a licensing to justify their choice, greater assortment increased the likelihood of choosing pleasurable options. On the other side, when this information is processed unconscious, a counterintuitive result is revealed in choice and rejection task.

However, initial results showed, that unconscious thinkers tend to maintain evaluative representations of more coherent decisions under complex set. This argument is supported by Abadie, Waroquier and Terrier (2013), who reported that unconscious thinking has an increase in memory attributes that are more relevant and more effective for the attributes that are important at the time of decision than the unimportant attributes (Bos et al., 2011). These studies have suggested that unconscious thinking has an advantage over conscious thinking, being more capable of integrating information that is relevant to decision making, once unconscious thinking is more holistic and better organized and thus superior for more complex choices.

Furthermore, in terms of difficulty task, our results confirm previously findings, for instance, Laran and Wilcox (2011) and Sokolova and Krishna (2016) have demonstrated that consumers spend more time to decide what is the best option in a rejection than in a choice strategy. They have demonstrated that decision-makers need greater emotional and cognitive ability to make decisions on rejection tasks (Laran and Wilcox, 2011), due to the limitation of the information processing capacity at the moment of choice (Dijksterhuis and Nordgren, 2006).

In study 2, we aimed to broaden the scope of the first experiment findings by replicating results in a subset of unconscious process. We have provided further evidence supporting that unconscious process happens behind working memory. Research shows that unconscious processes is not actually the result of unconscious thinking that occurs while people are distracted, but of conscious processes that occur while people solidify and report a judgment (Manigault, Handley and Whillock, 2015). Furthermore, we have investigated this potential alternative account for the unconscious process, introducing the cognitive load information variable (low vs. high) while participants have reported their judgments.

3.2 STUDY 2 – THE ROLE OF COGNITIVE LOAD ON UNCONSCIOUS PROCESSING

In study 2, we have introduced a cognitive load manipulation, as the literature on decision strategies has been shown that individuals need more time to deliberate decisions when they use a rejection strategy (Sokolova and Krishna, 2016). Cognitive load effect makes people less likely to engage in deliberative processing, because when individuals are performing two tasks at the same time the working memory becomes embarrassed to make deliberate decisions. Miller (1956) show that short-term memory is limited in the number of elements it can contain simultaneously. As such, we expected that when consumers process information based on unconscious, the effect of cognitive load would not influence choice and rejection strategy since the unconscious does not use resources of the working memory to processes information. We induce the cognitive load manipulation through Hayman et al. (2015), who have demonstrated their effectiveness in producing (high and low) cognitive load in the online experiment (Manigault, Handley and Whillock, 2015).

3.2.1 Design and participants

Participants from Mechanical Turk were invited by Amazon to answer a 10 minutes' online survey in exchange of .70 US dollars. The study adopted a full factorial design 2 (cognitive load: low vs. high) x 2 (decision strategy: choice vs. rejection) between-subjects under unconscious processing.

3.2.2 Procedures and stimuli

Participants were informed that they would receive information about four apartments (A-D) for rent, each apartment has six different attributes (see the experiment flow on appendix E). The manipulation was similar to the first study. Immediately, participants were informed that should form a global impression of each of four apartments. However, they also were informed that should perform two different memory task. Before starting any of the study,

participants were presented a consent form in on line version explain the research, after they accept the term they could start the research (see, Appendix A).

After, each apartments' attributes were presented in random order, one by one, for four seconds each. The first memory task involved a cognitive load information when participants were randomly assigned to one of two conditions of cognitive load (low vs. high). The cognitive load variable was manipulated through 4 x 4 matrices with 4 dots presented within 16 possible locations. The manipulation stimulus was adapted from Hayman et al. (2015), see appendix F. High cognitive load manipulations consisted of a random distribution of 4 dots, whereas the low cognitive load manipulation consisted of 4 dots line (Manigault, Handley and Whillock, 2015). This matrix was shown for four seconds. Participants were informed that after performing a series of judgment and decision tasks they would be asked to reproduce the initial matrix; it was important that during all tasks participants keep the initial dots pattern in memory. During this process, a second memory task was presented. We use the same word-search puzzle as well as in study 1. All participants received the same information in this task.

Then, participants were randomly assigned in one of two conditions of choice and rejection. As dependent variables we measured the decisions about apartments using the same trade-off scale as in study 1. After they answer the dependent variable participants were asked to reproduce the initial dot pattern. They received a blank matrix and needed to complete the matrix based on their memory. There was no time limit for the pattern reproduction task. At the end, participants answered the same attention check of Study 1 (Oppenheimer, Mevis and Davidenko, 2009), and answered some questions about demographics variable and they were debriefed, thanked for their participation, and given a code to redeem compensation through Amazon Mechanical Turk.

3.2.3 Results

Two hundred and seven participants were recruited from Mechanical Turk. One participant failed on the attention check and did not select the correct option. In addition, ten participants also failed on the cognitive load memory task, as they have completed the matrix with more than four dots. Both were excluded from the final sample, the final sample include one hundred and ninety-six participants (120 women; $M_{age} = 38.82$; $SD_{age} = 13.06$). The study

adopted a full factorial design 2 (cognitive load: low vs. high) x 2 (decision strategy: choice vs. rejection) between-subjects under unconscious processing.

3.2.4 Memory task

As a manipulation check, we first compared performance on the low versus high cognitive load patterns. The mean number of correctly localized dots in the low cognitive load condition was significantly higher than in the high cognitive load condition ($M_{low} = 3.95$ and $M_{high} = 2.93$, $t(195) = 8.82$, $p < .001$, *Cohen's d* = 1.26). The word-search task do not show statistically significant different between cognitive load condition ($M_{low} = 12.73$ and $M_{high} = 12.36$, $t(195) = .898$, $p = .324$, *Cohen's d* = .12). This shows that, regardless of the difficulty of cognitive load task, participants did not show statistically significant differences to perform word-search task.

3.2.5 Task Difficulty

Participants in low cognitive load conditions had less task difficulty perception than in the high cognitive load condition ($M_{low} = 3.08$ and $M_{high} = 5.98$, $t(194) = 8.08$, $p < .001$, *Cohen's d* = 1.58). This shows that, when cognitive load increases in terms of complexity the participants perceive bigger difficulty to perform the task. Thus, there is not interaction between cognitive load and decision strategy ($F(1,192) < 1$; $p = n.s.$).

3.2.6 Decision strategy

To analyze the effect of cognitive load and decision strategy a two-way ANOVA was performed. The cognitive load (low vs. high), decision strategy (choice vs. rejection) and interaction were considered as independent variables. It was used as dependent variable the trade-off decision scale. Participants who received the rejection stimulus as a dependent variable had their scores reversed, once the goal was to analyze the final choice.

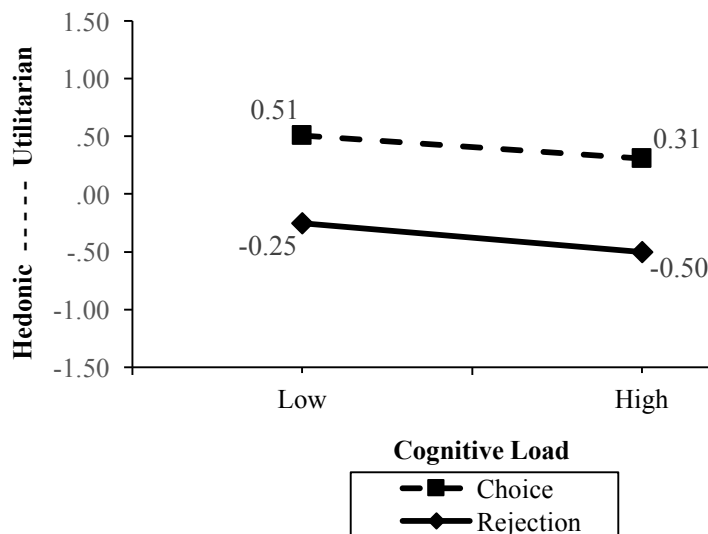
The analysis revealed a no statistically significant interaction ($F(1,192) < 1.0, p = n.s.$). The analysis revealed a statistically significant main effect of decision strategy ($F(1,192) = 6.61, p = .011, \text{Cohen's } d = .37$), see Figure 3 and Table 4. There was a significant difference between choice strategy ($M_{low} = .51, SD = 1.85, M_{high} = 0.31, SD = 1.87$) and rejection strategy ($M_{low} = -.25, SD = 2.30, M_{high} = -.50, SD = 2.40$). The main effect of cognitive load was not statistically significant ($F(1,192) < 1.00, p = n.s.$).

Table 4 - Two-way ANOVA between-subject

Dependent Variable: Trade-off decision						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	
Corrected Model	31.321 ^a	3	10.44	2.316	.077	
Intercept	.066	1	.066	.015	.904	
Cognitive load	2.558	1	2.558	.567	.452	
Strategy	29.812	1	29.812	6.612	.011	
Cognitive load * Strategy	.032	1	.032	.007	.933	
Error	865.633	192	4.509			
Total	897	196				
Corrected Total	896.954	195				

a. R Squared = .035 (Adjusted R Squared = .020)

Figure 3 - Cognitive load under Unconscious Processing



Source: Author

3.2.7 Discussion

As results of Study 2, we have reproduced the same results of Study 1 in a moderated subset of unconscious thought. We have showed that when individuals performing a cognitive load task, they engage in a decision through deliberation-without-attention (Manigault, Handley and Whillock, 2015; Dijksterhuis and Nordgren, 2006). If the unconscious process actually results from conscious thinking at the time of judgment, then participants, in the unconscious process conditions, should perform worse if they experience high load (or low load) while reporting their judgments (Manigault, Handley and Whillock, 2015). However, the cognitive load manipulation had no effect on the dependent variable and did not interact with decision strategy. This overall null effect of cognitive load suggests that the unconscious process does not result from conscious processing at the time of judgment, and judgments are accessed with negligible effort during the decision stage (Manigault, Handley and Whillock, 2015).

We reinforced the preposition that the unconscious thinking has an advantage, being more capable of integrating information that is relevant to decision making. Unconscious thinking is more holistic and better organized and thus superior for more complex decision making. We have demonstrated that consumer on choice strategy prefers more alternatives with utilitarian attributes than hedonic, alternatively consumer on rejection strategy prefers more alternatives with hedonic than utilitarian attributes (Dhar and Wertenbroch, 2000). We also strengthen the power of the proposition that depending on how information of alternatives is processed, consumers may have reverse decisions for alternatives with hedonistic versus utilitarian features in a complexity set.

Study 3 aimed to broaden the scope of the experimental findings and has investigated another potential alternative account for decision strategy. Some studies point out that cognitive load and ego depletion could have the same effect in decision strategy (Laran and Wilcox, 2011; Krishnamurthy and Nagpal, 2008) while other studies point to different mechanisms (Vosgerau, et al., 2008; Maranges et al., 2016). To test this possibility, we introduced the ego depletion task, while participants are making a distraction task. We have intended to test this proposition in a subset of unconscious thought, and have showed that consumers in depletion conditions

tend to make decision on choice strategy more similar to the participants on rejection strategy choosing a more hedonic alternative.

3.3 STUDY 3 – THE ROLE OF EGO DEPLETION ON UNCONSCIOUS PROCESSING

Study 3 tested the underlying mechanism of the effect of the type of distraction task. The aim was to look at effects that would carry over ego depletion on choice and rejection decision. In this study, we have introduced an ego depletion manipulation for some of the participants. Ego depletion effect happens when individuals significantly reduce their ability to self-control after to perform fatigue or frustration tasks (Muraven, Tice and Baumeister, 1998), and this effect may influence their subsequent performance on a task requiring self-regulation.

We expected that depletion would make participants on the choice condition to be able to choose a more hedonic alternative. As such, we expected that the ego depletion task was able to make participants on choice strategy to be more similar to rejection strategy in relation to hedonic attributes preference. Once individuals that undertake activities conceptualize as a work obligation, tiring and boring, their capacity to complete subsequent tasks that demand self-control diminishes (Laran and Janiszewski, 2010) leading to an indulgent decision.

To induce ego depletion, we used the unsolved puzzle task (Baumeister et al., 1998). The puzzle task was similar to the study 1 and 2. Participants when trying to complete an unsolved puzzle, consume a lot of mental energy, making the task tiring, defying, difficult and frustrating. We expected that the ego depletion manipulation would affect participants' subsequent decisions. We predict that the participants under depletion condition will make decision on choice strategy similarly to the participants in the rejection strategy choosing a more hedonic alternative.

3.3.1 Design and participants

Participants from Mechanical Turk were invited by Amazon to answer an online survey for 12 minutes in exchange of .70 US Dollar. The study adopted a full factorial design 2 (distraction task: ego depletion vs. control) x 2 (decision strategy: choice vs. rejection) between-subjects under unconscious processing.

3.3.2 Procedures and stimuli

Participants were informed that they would participate of two different no related tasks. In the first task, they were asked to form a global impression of each of four different apartments featuring different characteristics, this manipulation was similar study 1. The second task they were asked to assess perceptions about word-search puzzles. The word-search puzzle was the same of study 1 and 2, but in both conditions they received a framing informing that this task is an attention check. Before starting any of the study, participants were presented a consent form in on line version explain the research, after they accept the term they could start the research (see, Appendix A).

After, participants received all information about the four different apartments (A-D) through slide-show. As in study 2, they had to read the following information “At the end of the second task, you will be asked a few questions about the apartments task. Now, please proceed to task #2”. They were randomly assigned in one of two conditions (ego depletion vs. control). For this task participants received a word-search puzzle, as same as the study 1 and 2. In both conditions, after the word-search puzzle instructions, they had 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 was available 2 minutes after starting the task. In the beginning of this study every participant received the information, during instructions, that whether they failure on attention check their data will be deemed invalid and payment will be withheld for this reason. In the ego depletion condition, participants received an unsolved word-search puzzle. This puzzles were the same as the control conditional, but we have exchanged only three (Celery, Peach and China) of the fifteen words in the answer puzzle block. Individuals had to find all words to finish the task as it was informed after the puzzle instructions. The ego depletion manipulation informed that if individuals did not find all the words they could be eliminated from the task, as it was considered to be an attention check activity. The aim was to make participants to spend more time in this task and make them feel bored and tired leading them to a depletion state. There was no time limit to perform word-search puzzle task.

Thereafter, participants were randomly assigned in one of two conditions between choice and rejection. As dependent variables we measured decisions about apartments using the same measure of study 1 and 2. As manipulation check we asked participants to indicate how they felt about to task, through a 7-point scale (easy/hard; enjoyable/boredom;

pleasant/unpleasant; enthusiasm/frustration; fun/hard-work), and answer the follow questions as an ego depletion manipulation check “I had to exert control over myself during the task”; “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 a 11-point scale (not much – very much) from Jany (2008) and Baumeister et al. (1998). Then, they had to perform a recall of the apartments attributes and the same attention check of study 1 and 2 with some questions about demographic variables. At the end, participants received a debriefed and read the following message “Participants who did not correctly completed the word-search puzzle task WILL NOT have their data deemed invalid and payment will not be withheld for this reason. It was part of the tasks to attempt to fully solve a word-search puzzle that could not be entirely completed”, they were thanked for their participation, and given a code to redeem compensation through Amazon Mechanical Turk.

3.3.3 Results

Three hundred ninety-eight participants were recruited from Mturk. Twenty-one participants failed on the attention check and were exclude from the final sample, Three hundred seventy-seven participants (57% women; $M_{age} = 38.03$; $SD_{age} = 12.18$). The study adopted a full factorial design 2 (distraction task: ego depletion vs. control) x 2 (decision strategy: choice vs. rejection) between-subjects under unconscious processing.

3.3.4 Distraction task

As a manipulation check to the distraction task, we asked participants to answer (five items) how did they feel about the task. The items were averaged to create a composite feeling task index. A two-way ANOVA was performed and the interaction was not statistically significant ($F(1,373) = 2.85$, $p = .091$) but approached significance. Further inspection of the means showed that the direction of the differences was the same across decision strategy conditions but varied slightly in terms of their magnitude ($M_{egodepletion} = 3.84$, $SD = 1.57$ vs. $M_{control} = 2.54$, $SD = 1.24$) in the rejection condition and ($M_{egodepletion} = 3.63$, $SD = 1.46$ vs. $M_{control} = 2.85$, $SD = 1.52$) in the choice condition. Thus this potential interaction likely

stems from calibration issues and does not meaningfully influence the interpretation of the results of the key dependent variable.

Participants in the ego depletion condition ($M = 3.73$; $SD = 1.52$) was significantly higher bored/frustrated than in the control condition ($M = 2.70$; $SD = 1.39$; $t(375) = 6.88$, $p < .001$, *Cohen's d* = .71). The final questionnaire provided some additional evidence beyond the ego depletion manipulation checks. Three items asked participants if they had a temporary reduction in their self-capacity or willingness to engage in the difficult task, an inclination to give up and self-control during the puzzle task. The items were averaged to create a composite of ego depletion index ($\alpha = .76$). A two-way ANOVA was performed. A main effect yielded significant variation among the distraction task conditions ($F(1,373) = 34.51$, $p < .001$, *Cohen's d* = .71). Participants in the ego depletion condition were significantly more depleted ($M_{rejection} = 4.74$; $SD = 2.18$ and $M_{choice} = 4.48$; $SD = 2.39$) than control conditional ($M_{rejection} = 3.21$; $SD = 2.24$ and $M_{choice} = 3.26$; $SD = 2.23$). The analysis yielded a no significant decision strategy main effect ($F(1,373) < 1.0$, $p = n.s.$) and the absence of interaction ($F(1,373) < 1.0$; $p = n.s.$).

3.3.5 Recall attributes

As a manipulation check to apartments attributes, we asked to the participants to do a recall of attributes (see Table 5). We compared performance through a two-way ANOVA interaction between distraction task and decision strategy. The analysis revealed a no statistically significant distraction task main effect ($F(1,373) < 1.0$, $p = n.s.$), decision strategy main effect ($F(1,373) < 1.0$, $p = n.s.$) and no interaction ($F(1,373) < 1.0$, $p = n.s.$).

Table 5 - Recall attributes

Dependent Variable: Ego depletion manipulation				
Distraction				
	Depletion		Control	
	Mean	SD	Mean	SD
Rejection	5.09	1.44	5.35	1.05
Choice	5.44	1.09	5.44	1.16

Note: SD = standardized deviation

3.3.6 Decision strategy

To analyze the effect of distraction task and the type of decision a two-way ANOVA of decision was performed. The distraction task (ego depletion vs. control), decision strategy (choice vs. rejection) and interaction were considered as independent variables. It was used as dependent variable the trade-off decision scale. Participants who received the rejection stimulus as a dependent variable had their scores reversed, once the goal was to analyze the final choice, as same as studies 1 and 2.

A two-way ANOVA revealed that there was a significant interaction between the distraction task and decision strategy ($F(1,372) = 5.44, p < .05, \text{Cohen's } d = .24$). In the control condition, the choice strategy was statistically significantly and different than rejection strategy ($F(1,373) = 12.77, p < .001, \text{Cohen's } d = .37$). Participants in choice strategy ($M_{\text{choice}} = .43, SD = 1.95$) had apartment "D" with the most utilitarian features as the predominant decision and participants in rejection strategy ($M_{\text{rejection}} = -.61, SD = 1.90$) had apartment "B" with the most hedonic features as the predominant decision (see Figure 4 and Table 6).

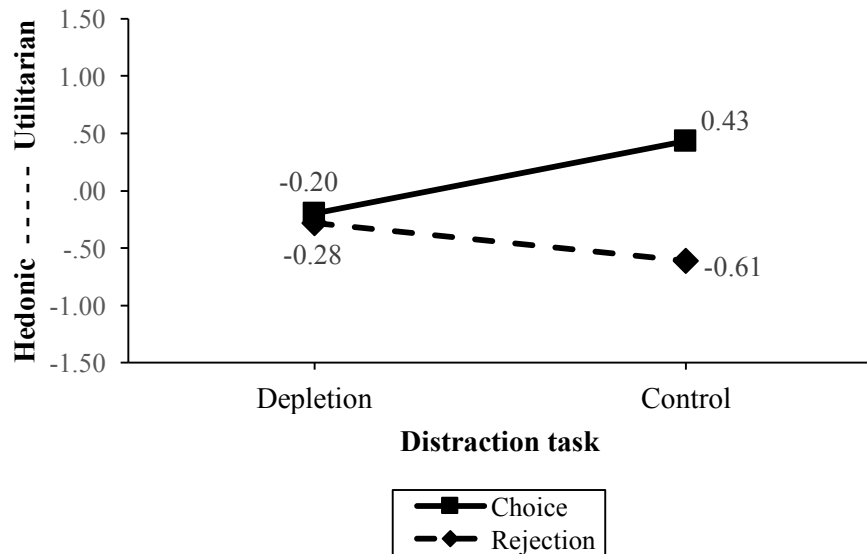
In the ego depletion condition, the choice strategy was not statistically significant from rejection strategy ($F(1,373) < 1.0, p = n.s.$). Participants in choice strategy ($M_{\text{choice}} = -.20, SD = 1.95$) had apartment "B" with the most hedonic features as the predominant decision as well as in rejection strategy ($M_{\text{rejection}} = -.28, SD = 2.17$). The choice strategy had revealed a statistically significant difference between ego depletion and control ($F(1,373) = 4.30, p < .05, \text{Cohen's } d = .21$) and did not reveal significant difference for the rejection strategy ($F(1,373) < 1.0, p = n.s.$).

Table 6 - Two-way ANOVA between-subject

Dependent Variable: Trade-off decision						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	
Corrected Model	53.411 ^a	3	17.804	4.452	.004	
Intercept	10.260	1	10.260	2.566	.110	
Distraction	2.242	1	2.242	.560	.455	
Strategy	30.056	1	30.056	7.515	.006	
Distraction*Strategy	21.761	1	21.761	5.441	.020	
Error	1491.724	373	3.999			
Total	1556	377				
Corrected Total	1545.135	376				

Note: a. R Squared = .035 (Adjusted R Squared = .027)

Figure 4 - Depletion resource under Unconscious Processing



Source: Author

3.3.7 Discussion

In Study 3, we have reproduced the same result of study 1 in a subset of unconscious though under complex context. Results showed that participants, when solving a distraction task that leads to ego depletion (Baumeister et al., 1998), tend to choose more hedonic alternatives than utilitarian and make decisions more similar to individuals in the rejection strategy. Thus, in line with our proposition, results of study 3 indicated that a distraction task that consumes a lot of mental energy, making the task tiring, defying, difficult and frustrating may lead consumers to choose more hedonic alternatives (or indulgent) as a way to recover limited resources. Shiv and Fedorikhin (1999) also found that when consumers processing limited resources, they evoke more affective (hedonic) than cognitive (utilitarian) reactions. In the same line, Laran and Janiszewski (2010) showed that tasks that are construed as work tend to deplete resources. After individuals undertake activities, they conceptualize as a work obligation and their capacity to complete subsequent tasks that demand self-control diminishes leading to an indulgence behavior.

In order to show the relationship effect of unconscious mode processing and decision strategy between two of our studies, we performed a single paper meta-analysis (McShane and Böckenholt, 2016) between the unmoderated studies and report the effect size of the

relationship between choice and rejection strategy, our effect has been consistent throughout the studies.

3.4 META-ANALYSIS BETWEEN CHOICE AND REJECTION STRATEGY

Meta analytic studies are already established even statistically and technically to synthesize individual studies in behavioral field (McShane and Böckenholt, 2016). However, in the literature, we can see few individual studies that have been performing meta-analyses among studies from the same research. Indeed, studies on consumer behavior frequently present multiple studies of a common phenomenon that are analyzed solely in isolation (McShane and Böckenholt, 2016). Based on that, Maner (2014) encouraged authors to conduct meta-analysis on author's own results. However, this practice is still relatively rare and its adoption is slow (Goh, Hall and Rosenthal, 2016). Conducting meta-analyses within manuscripts can increase precision of estimates (Cumming, 2014).

In decision-making literature, there are many meta-analytic studies about overload information (Chernev, Bockenholt and Goodman, 2015; Strick et al., 2011; Scheibehenne, Greifeneder and Todd, 2010; Acker, 2008). These meta-analytic studies try to understand how consumers make decisions when facing a complex context. There is two approach, to understand the phenomenon. The first, focuses on understanding the conscious process used by individuals and the cognitive limitations they have when confronted with a large number of information pieces (Chernev, Bockenholt and Goodman, 2015; Scheibehenne, Greifeneder and Todd, 2010). The second, focuses on demonstrating that the unconscious shows a superior capacity in dealing than conscious processes with a large set of information for decision-making (Strick et al., 2011; Acker, 2008). While these approaches focus on understanding how individuals processing or making decision under complexity information, we try to understand how unconscious thought process complex information when individuals using different decision strategy.

To support results of our studies, we have conducted a random-effect meta-analysis of the main effect between choice and rejection under unconscious process mode across studies 1 and 3 (unmoderated subset, see

Table 7), using a statistical tool developed by McShane and Böckenholt (2017) for single-paper meta-analyses. We expected that decision between hedonic and utilitarian

alternatives have different effects on rejection or choice conditions under unconscious processing.

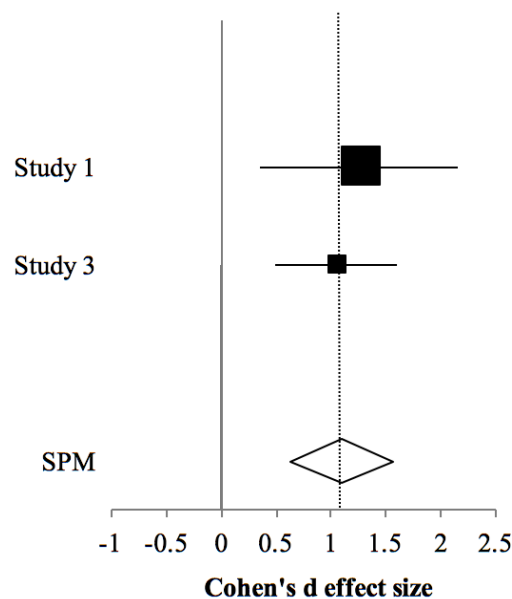
Table 7 - Summary data from experiment 1 and 3

Study	Process mode	Strategy decision	Mean	SD	N
1	Unconscious	Choice	0.54	2.17	46
1	Unconscious	Rejection	-0.71	2.29	48
3	Unconscious	Choice	0.43	1.95	92
3	Unconscious	Rejection	-0.61	1.90	95

Source: study 1 and 3

Figure 5 provides estimates and the confidence interval estimate of 95% for each study as well as for the overall Single-paper Meta-analysis estimate. The average sample size per study is indicated by the black squares. The forest plot is useful to show that some effects are cumulatively detected rather than in an individual study and that the effect size present homogeneity between studies.

Figure 5 - Forest plot Single-paper Meta-analysis



Note: SPM = Single-paper meta-analysis' effect size

Source: Author

Consistent with our preposition, the meta-analysis revealed that, across our studies, there is a significant difference in expected effect between the choice and rejection conditions on unconscious processing (*Estimate* = 1.097, *SE* = .024; *IC95%* = .62 to 1.56; *z* = 4.54, *p* < .001). It supports that individuals, under complex context, when processing information unconsciously, on choice strategy, prefer products with more utilitarian features, but in rejection strategy they prefer products with more hedonic features.

4 GENERAL DISCUSSION

In this research, our main aim was to attend some theoretical gaps and calls for further research presented in the field literature. For instance, Laran and Wilcox (2011) have proposed that future research should investigate the relationship between the decision strategy and choice under complex sets. In addition, Dhar and Wertenbroch (2000, p. 69) pointed out that “greater complexity and task realism in choice and rejection strategy from a set of more than two alternatives may induce different decision processes that may change the proposed effect”. Besides that, Sokolova and Krishna (2016, p. 630) have suggested that “unconscious processing can outperform deliberation in contexts where access to unconsciously acquired information is necessary to make more accurate decisions”. As an aim to attend these calls, our main proposition was based on analyzing how the (un)conscious processing of hedonic and utilitarian attributes affect the choice and rejection strategy under different levels of complexity in multiattribute decision making. Unlike past studies that have focused on understanding how people choose or reject options under an economic paradigm (Sokolova and Krishna, 2016; Dhar and Wertenbroch, 2000), we have investigated how conscious and unconscious processing mode influence this relationship under different sets, based on the principles of UTT (Dijksterhuis et al., 2006; Dijksterhuis and Nordgren, 2016). We have searched several previous findings in the literature such as researches that had examined hedonic-utilitarian trade-offs involving choice or rejection strategy (Sokolova and Krishna, 2016; Wilcox and Laran, 2011; Dhar and Wertenbroch, 2000), and the relationship of sets sizes and hedonic and utilitarian features (Sela and Berger, 2012). As well as the integration of another theoretical approach that investigates the efficiency of conscious and unconscious processing mode to make better choice or judgment under simple or complex context (Dijksterhuis et al., 2006; Dijksterhuis and Nordgren, 2016).

Through three experimental studies carried out and a single-paper meta-analysis, it was possible to verify how individuals process hedonic and utilitarian attributes and, depending on the strategy they use, they could make a different decision according to the set size. In the first study, we have tested our main proposition and have identified a novel boundary condition when individuals make choice or rejection strategy with different sets size and characteristics (hedonic and utilitarian). Individuals tend to decide depending on how they process this information (conscious or unconscious). We also have replicated other three previous findings, in a simple context. We have reproduced the same result as Dhar and Wertenbroch (2000),

demonstrating that hedonic attributes are most used for rejection strategies, while utilitarian attributes are most commonly used in a choice strategy when individuals process this information consciously. We have also confirmed previous finding as Sela and Berger (2012), showing that attribute quantity benefits more hedonic than utilitarian options in a complex context, when this information was processed consciously. In addition, we confirm previous results on decision strategy, finding that individuals have more difficulty to decide when they use a rejection strategy under complex settings (Wilcox and Laran, 2012; Sokolova and Krishna, 2016), due to the limitation of the information processing capacity at the moment of decision making (Dijksterhuis and Nordgren, 2006).

In the second study, we broaden our findings of the first study. We have replicated the findings of Study 1 through a subset of unconscious processing mode. We have shown that cognitive constraints make people less likely to engage in deliberative (conscious) processing. We provide further evidence supporting that individuals under unconscious thought do not deliberate during a distraction task (Maranges et al., 2017; Manigault, Handley and Whillock, 2015). In this experiment 2, we have introduced the cognitive load information (low vs. high), when participants making the distraction task reported their judgments about their decisions. We have confirmed previous research findings on unconscious thought theory showing that cognitive load does not influence the decision strategies, as cognitive load may prevent even cognitive processes such as short-term memory maintenance and attention to peripheral information (Maranges et al., 2017) given that the unconscious thought works behind short-term memory (Dijksterhuis et al., 2006). As a consequence, we reproduce a similar pattern in complex context as in Study 1.

In Study 3, we expanded the scope of our previous experimental findings and ruled out a potential alternative explanation for the decision strategy. Some studies point out that cognitive load and ego depletion could have the same effect on decision strategy (Laran and Wilcox, 2011; Krishnamurthy and Nagpal, 2008) while other studies point to different mechanisms (Vosgerau et al., 2008; Maranges et al., 2016). In this study, we have adopted this alternative explanation and have found a novel boundary condition of the effect of ego depletion on decision strategy. We show that participants trying to complete an unsolved puzzle, that consumes a lot of mental energy, may have their subsequent performance influenced on a task requiring self-regulation (Baumeister et al., 1998). Our results have shown that participants, when solving a distraction task that leads to ego depletion (Baumeister et al., 1998), tend to choose more hedonic alternatives than utilitarian and make decisions more similar to

individuals in the rejection strategy according to our previous studies.

At the end, we performed a single-paper meta-analysis (McShane and Böckenholt, 2016) to confirm that our studies support the relationship between unconscious processing mode and decision strategy. Consistent with our finding, the meta-analysis has revealed that, across study 1 and 3 (unmoderated subset), there is a significant effect size between choice and rejection strategy on unconscious processing mode. This results confirm our proposition that, when individuals are in a complex context and processing information unconsciously, under choice strategy, they prefer alternatives with more utilitarian features, while under rejection strategy they prefer alternatives with more hedonic features.

4.1 THEORETICAL CONTRIBUTIONS

This research findings advance marketing literature in several ways, integrating and qualifying previous findings. Our research responds to previous calls, testing the effect of strategies of choice and rejection on different processing modes (Laran and Wilcox, 2011; Sokolova and Krishna, 2016), different sets sizes (Laran and Wilcox, 2011; Dhar and Wertenbroch, 2000) and possible boundary conditions (Laran and Wilcox, 2011; Sokolova and Krishna, 2016; Dhar and Wertenbroch, 2000). Our findings have provided substantial insights about the differences between choice, rejection and processing mode in terms of underlying evaluation processes.

First, the decision strategy findings, presented so far in the literature, have focused efforts on explaining and understanding how the deliberative processes influence decision strategies (Sokolova and Krishna, 2016; Shafir 1993; Dhar and Wertenbroch 2000). These studies have used a rational approach in light of economic theories in order to explain this phenomenon. However, there are few studies that have tried to understand how an unconscious processing mode influences these strategies (Foo, Haji and Sakai, 2014; Laran and Wilcox, 2011; Dijksterhuis, 2004). Our results show a new light and perspective through a psychological approach that considers that the deliberative-without-attention process (unconscious) is as proficient as deliberative process (conscious) to make decision (Kahneman, 2003; Dijksterhuis, 2004; Bargh, 1990).

Recent studies have shown the idea that one processing mode is better than another given its limitations (Dijksterhuis, 2004; Laran, 2016). This research has demonstrated that the unconscious processing is able to integrate a large amount of information, performing better results in complex context (Dijksterhuis et al., 2006), while conscious processing is able to consider differences in magnitude between attributes values, performing better in simple sets or when individuals need to examine specific magnitudes (Payne and Bettman, 2008; Laran 2016). It was also possible to observe through the Unconscious Thought Theory (UTT) that while conscious (unconscious) process is able to make a trade-off among alternatives with different attributes in a simple context, unconscious (conscious) process presents a bias in their decisions and vice versa, based on the complexity of the context. These findings have complemented previous research on UTT (Dijksterhuis et al., 2006). For instance, previous studies have tried to show the advantage of unconscious over conscious processing in a complex context and the advantage of conscious over unconscious processing in a simple context (see Acker, 2008; Nieuwenstein and Van Rijn, 2012; Nieuwenstein et al., 2015). Alternatively, we focused on understanding whether hedonic and utilitarian attributes influence preference under conscious and unconscious processing when individuals use different decision strategies under complexity context. We extend the scope of UTT studies by introducing these new boundary conditions through the type of attributes and type of decision strategies.

Based on previous calls from different studies on decision strategy (Laran and Wilcox, 2011; Sokolova and Krishna, 2016; Dhar and Wertenbroch, 2000), this research has found a new boundary condition between the processing mode and information complexity. In a simple context, we have confirmed previous results (Dhar and Wertenbroch, 2000) that have demonstrated that when consumers need to decide among simple sets and are engaged in conscious processing, they tend to make a trade-off decision. Furthermore, people tend to choose utilitarian attributes in any of the decision strategy conditions (choice or rejection), when processing information unconsciously. However, this result is counterintuitive in a complex context when we have shown that results are reversed, as consumers need to decide among more complex sets alternatives and features (Wang et al., 2015; Dijksterhuis and Nordgren, 2006). Participants who engage in a conscious process has a biased decision (Sela and Berger, 2012), but when this information is processed unconsciously, consumers tend to make a trade-off decision (Dhar and Wertenbroch, 2000). Our findings have complemented previous research on trade-off alternatives with different attributes and processing mode (Wang

et al., 2015) hedonic and utilitarian attributes and choice and rejection (Dhar and Wertenbroch 2000; Laran and Wilcox, 2011; Sokolova and Krishna, 2016).

Prior research about decision strategies and attribute types, have demonstrated that hedonic attributes are most used for rejection strategies, while utilitarian attributes are most commonly used in a choice strategy (Dhar and Wertenbroch, 2000). We have replicated this results under different complexity contexts (Dijksterhuis, 2006). Then, it is possible to infer that consumers that have processed information consciously, in a simple context, preferred hedonic options under rejection strategy and utilitarian option under choice strategy. As well, if this information were processed unconsciously, in a complex context, customers will make the same decision as in conscious processing (trade-off). Conversely, consumers that have processed information unconsciously, in complex set, preferred utilitarian options in any strategy, and if this information were processed consciously, in complex context, customer prefer hedonic options in any strategy.

Discarding possible alternative explanations and boundary conditions, we have tested different moderators in a subset of unconscious processing (study 2 and 3), since some studies have demonstrated that cognitive load and depletion can produce similar effects (Vosgerau et al., 2008) or different effects (Maranges et al., 2016) on decision strategies. We have shown that cognitive load (Manigault, Handley and Whillock, 2015; Dijksterhuis and Nordgren, 2006) had no effect on neither of the dependent measures (trade off decision) nor on the processing modes. This evidence supports that unconscious process happens behind the working memory (Dijksterhuis and Nordgren, 2006). Thus, we have shown that participants did not process information during the distraction task, reinforcing previous findings that have shown that while individuals encode complex information previously and are distracted for a period of time, they are unable to process this information consciously due to the use of working memory during the distraction task (Manigault, Handley and Whillock, 2015). In terms of cognitive load, if attentional resources are not necessary for unconscious processing, then cognitive load does not affect the memory of the attributes that were processed in this mode (Manigault, Handley and Whillock, 2015).

We have also demonstrated that ego depletion influences decision strategy when these alternatives are composed by hedonic and utilitarian attributes (Vosgerau et al., 2008). A distraction task that consumes a lot of mental energy, making the task tiring, defying, difficult and frustrating may lead consumers to choose more hedonic alternatives (or indulgent) as a way

to recover limited resources. Previous studies have shown that tasks that are construed as work tend to deplete resources and that after individuals undertake activities, they conceptualize as a work obligation, diminishing their capacity to complete subsequent tasks that demand self-control and leading to an indulgence behavior (Laran and Janiszewski, 2010). In the same way, when consumers processing has limited resources, they evoke more affective (hedonic) than cognitive (utilitarian) reactions (Shiv and Fedorikhin, 1999). Although some studies have demonstrated that these mechanisms work similarly in different decisions strategy, we show that they have a different function under these condition

Finally, as previously proposed, our findings contribute to the choice and rejection literature showing that the task type not only changes the weights allocated on attributes options (Laran and Wilcox 2011; Sokolova and Krishna, 2016), but we also show how this information is processed (Dijksterhuis, 2006) and their possible mechanisms (Manigault, Handley and Whillock, 2015; Maranges et al., 2016).

4.2 MARKETING IMPLICATIONS

According to our research results, we can offer several practical implications for consumers and marketing managers. For consumers, under 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 a decision making process. For instance, consumers looking for more utilitarian benefits should use choice strategy but should also let this information be processed unconsciously, making this decision after a short period of distraction. In contrast, when individuals are looking for more hedonic benefits they should use the rejection strategy. When consumer process information consciously, the outcome tends to present more hedonic alternatives, regardless the type of strategy used.

Nonetheless, when consumers are looking for apartments to rent or buy and they face a complex decision process that involves numerous alternatives with different attributes, they may deal with an information overload and make poor decisions. Besides, our results suggest that when individuals are looking for more utilitarian alternatives (cheapest, closest, good network signal), they may opt for a choice strategy, but that strategy is only effective after a

period of distraction. On the other hand, when they are looking for more hedonic alternatives (more expensive, best view, landscaping) a deliberative process may be more convenient for consumers in both strategies (choice or rejection).

Another possible consumer implication, not tested here, could help consumers to better manage their food consumption and improve health. For instance, dietary consumers generally use rejection strategies to make decision. They eliminate alternatives that they cannot include on their menu or should not eat. However, rejection strategy leads consumer to choose unhealthier (hedonic) rather than healthier (utilitarian) alternatives, resulting in more inconsistent alternatives with their goals. Dietaries instead of using a rejection strategy could use choice strategy using a conscious process. When using choice strategies, consumers may select healthier sets (utilitarian).

For marketing managers that sell goods or services in a competitive and complex context, our findings show that companies could benefit from this knowledge through managing this information. It is possible to send folders, to potential customers, with a large number of alternatives (products), so they would be able to process information before buying. To help these process, sellers could reduce the number of alternatives to simplify a final decision. Managers or sellers may consider to encourage consumer to adopt a rejection-based decision strategy, interested to sell more hedonic alternatives. When they are interested to sell more utilitarian alternatives sellers may consider to encourage consumer to adopt a choice-based decision strategy.

We recommend that real estate agents use tactics to discover which type of decision strategy is used by their clients. By discovering the type of decision strategy used by their customers he/she can concentrate on presenting alternatives that are more consistent with their decision strategies. For instance, agents may present more hedonic alternatives to consumers using rejection strategies and more utilitarian alternatives for consumers using choice strategies, since information was previously processed by consumers and, if this information was not previously processed, agents may offer hedonic alternatives due to it same effect in both strategies decision. The current results offer insights on how processing mode and decision strategy can influence consumer in distinct ways to make decisions about hedonic and utilitarian alternative.

4.3 LIMITATIONS AND FUTURE RESEARCH

This research has a number of limitations, of which some are discussed here and others can be solved in future studies. First, in every study, apartment's attributes manipulation was realized based on the same procedures. Although we have shown that the findings could be replicated in all studies, through our single-paper meta-analysis, manipulations that involved situations in real life were not tested. Field experiments studies may be carried out to overcome this limitation which could increase the external validity of the results (Gneezy, 2017).

Second, all studies were carried out in an online laboratory environment through Amazon's Mechanical Turk platform. The use of this platform may limit the degree to which findings can be generalized. Considering that data collection is limited to participants who are enrolled in this platform, it does not reflect the reality of population. On the other hand, Paolacci, Chandler and Ipeirotis (2010) have advocated the use of this platform to carry out studies, since they observed in their research that Mechanical Turk workers are closer to the North American population than students recruited in traditional university research.

Third, another artifact that is impossible to monitor is the online data collection, because participants may misbehavior, resulting in a poor data quality. This may cause the subjects to pay less attention than it is necessary during the study (Oppenheimer, Meyvis and Davidenko, 2009). However, Oppenheimer, Meyvis and Davidenko (2009) suggested that this artifact can be solved, using attention checks questions in order to identify the subjects that are failing. Goodman and Paolacci (2017) also suggest to require participants to have a high approval rate (e.g., 95% or higher) and large experience (more than 500 hits completed) to be eligible to participate in tasks, justifying that a high number of rejections will allow less work available to workers. In all studies, this recommendation was followed and questions were used to check participants' attention, which served as a cut-off point to reject inattentive participants. Besides, we have recruited only workers who had approved rate higher than 95% and more than 500 hits completed.

Forth, the cognitive load manipulation used in the second experiment was comprised of visuospatial dot patterns whereas the decision task description was primarily verbal, as same as Manigault, Handley and Whillock's study (2015). We face the same limitations as the author's study (Manigault, Handley and Whillock, 2015), as visuospatial and verbal processing may employ different cognitive resources, it is possible that the present cognitive load manipulation

did not interfere with the decision task enough to adequately test our proposition. In contrast, visuospatial stimuli are preferred on online task instead of memorizing letters or numbers sequences (Laran and Wilcox, 2011), as it is more difficult to reproduce patterns. As a suggestion, future studies should make use of verbal cognitive load manipulations to address this issue.

Fifth, in the literature, studies that attempted to test the principles of UTT have a wide variation in relation to the tasks of distraction types, such as: N-back (Bos and Dijksterhuis, 2011; Dijksterhuis and Meurs, 2006), anagrams (Strick, Dijksterhuis and van Baaren, 2010), word search (Bos and Dijksterhuis, 2011; Nieuwenstein and Rijn, 2012) and so on. We have chosen to apply a single type of distraction task in our studies since some studies have already identified distraction tasks as a possible moderator (Acker, 2008; Nieuwenstein et al., 2015). In order to be able to control this variation between studies, we have used the words-search task as *ceteris paribus* and we could vary the information load (Study 2). Besides, we have conceptualized the same task as being a tedious and tiring work obligation (Study 3). 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 new distraction tasks boundary condition.

At the end, research could also examine possible boundary conditions between processing mode and rejection strategy. We find that individuals in choice strategy took similar decisions to rejection strategy individuals, when they are more depleted (study 3). It is important to understand if there are conditions where rejection strategy has a reversion effect. Future research could also examine if goal-orientation would influence decisions strategy under different processing mode. Since it is possible to suggest that decision-making process is more subject to the goals pursuit (Laran, 2016). Since our studies did not try to understand how the search for a goal can influence the way of processing, further research could address this question.

REFERENCE

- Abadie, M., Waroquier, L., and Terrier, P. (2013). Gist memory in the unconscious-thought effect. *Psychological Science*, 24(7) 1253-1259.
- Acker, F. (2008). New findings on unconscious versus conscious thought in decision making: Additional empirical data and meta-analysis. *Judgment and Decision Making*, 3(4), 292-303.
- Ariely, D., and Carmon, Z. (2000). Gestalt characteristics of experiences: the defining features of summarized events. *Journal of Behavioral Decision Making*, 13(2), 191.
- Babin, B. J., Darden, W. R., and Griffin, M. (1994). Work and/or fun: measuring hedonic and utilitarian shopping value. *Journal of consumer research*, 20(4), 644-656.
- Baker, A. (2011). Cue Usage in Conscious and Unconscious Thought. The Ohio State University. Department of Psychology Honors Theses.
- Bargh, J. A. (1990). Goal and intent: Goal-directed thought and behavior are often unintentional. *Psychological Inquiry*, 1(3), 248-251.
- Bargh, J. A. (2011). Unconscious thought theory and its discontents: A critique of the critiques. *Social Cognition*, 29(6), 629-647.
- Batra, R., and Ahtola, O. T. (1991). Measuring the hedonic and utilitarian sources of consumer attitudes. *Marketing letters*, 2(2), 159-170.
- Baumeister, R. F., and Bargh, J. A. (2014). Conscious and unconscious: toward an integrative understanding of human mental life and action. *Dual-Process Theories of the Social Mind*, 35-49.
- Baumeister, R. F., Bratslavsky, E., Muraven, M., and Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of personality and social psychology*, 74(5), 1252.
- Bekker, H. L. (2006). Making choices without deliberating. *Science*, 312, 1472.
- Bettman, J. R., Luce, M. F., and Payne, J. W. (1998). Constructive consumer choice processes. *Journal of consumer research*, 25(3), 187-217.

- Bos, M. W., and Dijksterhuis, A. (2011). Unconscious thought works bottom-up and conscious thought works top-down when forming an impression. *Social cognition*, 29(6), 727-737.
- Bruyneel, S., Dewitte, S., Vohs, K. D., and Warlop, L. (2006). Repeated choosing increases susceptibility to affective product features. *International Journal of Research in Marketing*, 23(2), 215-225.
- Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of personality and social psychology*, 39(5), 752.
- Chaiken, S., and Trope, Y. (Eds.). (1999). *Dual-process theories in social psychology*. Guilford Press.
- Chen, J., and Proctor, R. W. (2017). Role of accentuation in the selection/rejection task framing effect. *Journal of Experimental Psychology: General*, 146(4), 543.
- Cheng, P. Y., and Chiou, W. B. (2010). Rejection or selection: influence of framing in investment decisions. *Psychological reports*, 106(1), 247-254.
- Chernev, A. (2009). Choosing versus rejecting: the impact of goal-task compatibility on decision confidence. *Social Cognition*, 27(2), 249-260.
- Chernev, A., Böckenholt, U., and Goodman, J. (2015). Choice overload: A conceptual review and meta-analysis. *Journal of Consumer Psychology*, 25(2), 333-358.
- Chitturi, R., Raghunathan, R., and Mahajan, V. (2008). Delight by design: The role of hedonic versus utilitarian benefits. *Journal of Marketing*, 72(3), 48-63.
- Claxton, G. (1997). *Hare brain, tortoise mind: How intelligence increases when you think less*. New York: HarperCollins.
- Creswell, J. D., Bursley, J. K., and Satpute, A. B. (2013). Neural reactivation links unconscious thought to decision making performance. *Social cognitive and affective neuroscience*. 8(8), 863-869
- Dawes, R. M. (1979). The robust beauty of improper linear models in decision making. *American psychologist*, 34(7), 571.
- Dawes, R.M., and Corrigan, B. (1974). Linear models in decision making. *Psychological Bulletin*, 81, pp. 95–106

- de Vries, M., Witteman, C. L., Holland, R. W., and Dijksterhuis, A. (2010). The unconscious thought effect in clinical decision making: an example in diagnosis. *Medical Decision Making*, 30(5), 578-581.
- Deutsch, R., Gawronski, B., and Strack, F. (2006). At the boundaries of automaticity: negation as reflective operation. *Journal of personality and social psychology*, 91(3), 385.
- Dijksterhuis, A. (2004). Think different: the merits of unconscious thought in preference development and decision making. *Journal of personality and social psychology*, 87(5), 586.
- Dijksterhuis, A., and Nordgren, L. F. (2006). A theory of unconscious thought. *Perspectives on Psychological science*, 1(2), 95-109.
- Dijksterhuis, A., and Strick, M. (2016). A case for thinking without consciousness. *Perspectives on Psychological Science*, 11(1), 117-132.
- Dijksterhuis, A., Bos, M. W., Nordgren, L. F., and Van Baaren, R. B. (2006). On making the right choice: The deliberation-without-attention effect. *Science*, 311(5763), 1005-1007.
- Dijkstra, K. A., van der Pligt, J., van Kleef, G. A., and Kerstholt, J. H. (2012). Deliberation versus intuition: Global versus local processing in judgment and choice. *Journal of Experimental Social Psychology*, 48, 1156-1161.
- Dhar, R., and Wertenbroch, K. (2000). Consumer choice between hedonic and utilitarian goods. *Journal of marketing research*, 37(1), 60-71.
- Edwards, W. (1961). Behavioral decision theory. *Annual review of psychology*, 12(1), 473-498.
- Edwards, W., and Newman, J. R. (2003). Multi attribute evaluation. In T. Connolly, H. R. Arkes, and K. R. Hammond (Eds.), *Judgment and decision making: An interdisciplinary reader* (pp. 17–34). New York: Cambridge University Press.
- Einhorn, H. J. (1970). The use of nonlinear, noncompensatory models in decision making. *Psychological bulletin*, 73(3), 221.
- Evans, J. S. B. (2008). Dual-processing accounts of reasoning, judgment, and social cognition. *Annual review of psychology*, 59, 255-278.
- Foo, J. C., Haji, T., and Sakai, K. (2014). Prefrontal mechanisms in preference and non-preference-based judgments. *NeuroImage*, 95, 151-161.

- Gawronski, B., and Creighton, L. A. (2013). Dual-process theories. *The Oxford handbook of social cognition*, 282-312.
- Ganzach, Y. (1995). Attribute scatter and decision outcome: Judgement versus choice. *Organizational Behavior and Human Decision Processes*, 62, 113–122.
- Gensch, D. H., and Ghose, S. (1992). Elimination by dimensions. *Journal of Marketing Research*, 417-429.
- Gigerenzer, G., and Goldstein, D. G. (1996). Reasoning the fast and frugal way: models of bounded rationality. *Psychological review*, 103(4), 650.
- Ghiselin, B. (1952). *The creative process: A symposium* (Vol. 717). University of California Press.
- Gneezy, A. (2017). Field experimentation in marketing research. *Journal of Marketing Research*, 54(1), 140-143.
- González-Vallejo, C., Lassiter, G. D., Bellezza, F. S., and Lindberg, M. J. (2008). Save angels perhaps: A critical examination of unconscious thought theory and the deliberation-without-attention effect. *Review of General Psychology*, 12(3), 282.
- Goodman, J., and Naylor, R. W. (2014). When consumers prefer to include: Consideration set construction strategies from large product assortments. *ACR North American Advances*.
- Goodman, J. K., and Paolacci, G. (2017). Crowdsourcing consumer research. *Journal of Consumer Research*, 44(1), 196-210.
- Groeppel-Klein, A., Thelen, E., and Antretter, C. (1999). The Impact of Shopping Motives on Store-Assessment, in *E - European Advances in Consumer Research Volume 4*, eds. Bernard Dubois, Tina M. Lowrey, and L. J. Shrum, Marc Vanhuele, Provo, UT: *Association for Consumer Research*, Pages: 63-72.
- Ham, J., and van den Bos, K. (2010). On unconscious morality: The effects of unconscious thinking on moral decision making. *Social Cognition*, 28(1), 74-83.
- Hasford, J. (2014). Should I think carefully or sleep on it?: Investigating the moderating role of attribute learning. *Journal of Experimental Social Psychology*, 51, 51-55.

- Heller, D., Levin, I. P., and Goransson, M. (2002). Selection of strategies for narrowing choice options: Antecedents and consequences. *Organizational Behavior and Human Decision Processes*, 89(2), 1194-1213.
- Heyman, T., Van Rensbergen, B., Storms, G., Hutchison, K. A., and De Deyne, S. (2015). The influence of working memory load on semantic priming. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 41(3), 911.
- Hirschman, E. C., and Holbrook, M. B. (1982). Hedonic consumption: emerging concepts, methods and propositions. *Journal of Marketing*, 92-101.
- Holbrook, M. B., and Hirschman, E. C. (1982). The experiential aspects of consumption: consumer fantasies, feelings, and fun. *Journal of Consumer Research*, 9(2), 132-140.
- Huber, V. L., Neale, M. A., and Northcraft, G. B. (1987). Decision bias and personnel selection strategies. *Organizational Behavior and Human Decision Processes*, 40(1), 136-147.
- Irwin, J. R., and Naylor, R. W. (2009). Ethical decisions and response mode compatibility: Weighting of ethical attributes in consideration sets formed by excluding versus including product alternatives. *Journal of Marketing Research*, 46(2), 234-246.
- Iyengar, S. S., and Lepper, M. R. (2000). When choice is demotivating: Can one desire too much of a good thing? *Journal of personality and social psychology*, 79(6), 995.
- Jacoby, J., Speller, D. E., and Kohn, C. A. (1974). Brand choice behavior as a function of information load. *Journal of Marketing Research*, 63-69.
- Jany, D. (2008). Resource depletion and persuasion: the moderating Role of the heuristic principle of reciprocity (Bachelor's thesis, University of Twente).
- Kahneman, D. (2003). A perspective on judgment and choice: mapping bounded rationality. *American psychologist*, 58(9), 697.
- Keeney, R. L., and Raiffa, H. (1976). Decision analysis with multiple conflicting objectives. Wiley & Sons, New York.
- Kiefer, Markus (2012). Executive Control Over Unconscious Cognition: Attentional Sensitization of Unconscious Information Processing, *Frontiers in Human Neuroscience*, 6 (March), 1-12.
- Kunst-Wilson, W., and Zajonc, R. B. (1980). Affective discrimination of stimuli that cannot be recognized. *Science*, 207, 557-558.

- Krishnamurthy, P., and Prokopec, S. (2010). Resisting that triple-chocolate cake: Mental budgets and self-control. *Journal of Consumer Research*, 37(1), 68-79.
- Laran, J. (2016). Consumer goal pursuit. *Current Opinion in Psychology*, 10, 22-26.
- Laran, J., and Janiszewski, C. (2010). Work or fun? How task construal and completion influence regulatory behaviour. *Journal of Consumer Research*, 37, 967-983. doi: 10.1086/656576
- Laran, J., Janiszewski, C., and Salerno, A. (2016). Exploring the Differences between Conscious and Unconscious Goal Pursuit. *Journal of Marketing Research*, 53(3), 442-458.
- Laran, J., and Wilcox, K. (2011). Choice, rejection, and elaboration on preference-inconsistent alternatives. *Journal of Consumer Research*, 38(2), 229-241.
- Lerouge D. (2009). Evaluating the benefits of distraction on product evaluations: the mind-set effect. *Journal of Consumer Research*. 36, 367–379.
- Levin, I. P., Gaeth, G. J., Schreiber, J., and Lauriola, M. (2002). A new look at framing effects: Distribution of effect sizes, individual differences, and independence of types of effects. *Organizational behavior and human decision processes*, 88(1), 411-429.
- Lizardo, O., Mowry, R., Sepulvado, B., Stoltz, D. S., Taylor, M. A., Van Ness, J., and Wood, M. (2016). What are Dual Process Models? Implications for Cultural Analysis in Sociology. *Sociological Theory*, 34(4), 287–310.
- Lofman, B. (1991). Elements of experiential consumption: an exploratory study. *Advances in Consumer Research*, 18(1), 729-735.
- Machin, J. (2017). Choosing by Selecting or Rejecting: How Decision Strategy Influences Consumer Satisfaction. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, 29, 26.
- Manrai, A. K., and Sinha, P. (1989). Elimination-by-cutoffs. *Marketing Science*, 8(2), 133-152.
- Manigault, A. W., Handley, I. M., and Whillock, S. R. (2015). Assessment of unconscious decision aids applied to complex patient-centered medical decisions. *Journal of medical Internet research*, 17(2), e37.

- Maranges, H. M., Schmeichel, B. J., and Baumeister, R. F. (2017). Comparing cognitive load and self-regulatory depletion: Effects on emotions and cognitions. *Learning and Instruction*, 51, 74-84.
- McShane, B.B. and Böckenholt, U. (2017), Single Paper Meta-analysis: Benefits for Study Summary, Theory-testing, and Replicability. *Journal of Consumer Research*, 43(6), 1048-1063.
- Meloy, M. G., and Russo, J. E. (2004). Binary choice under instructions to select versus reject. *Organizational Behavior and Human Decision Processes*, 93(2), 114-128.
- Messner, C., and Wänke, M. (2011). Unconscious information processing reduces information overload and increases product satisfaction. *Journal of Consumer Psychology*, 21(1), 9-13.
- Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological review*, 63(2), 81.
- Mourali, M., and Nagpal, A. (2013). The powerful select, the powerless reject: Power's influence in decision strategies. *Journal of Business Research*, 66(7), 874-880.
- Muraven, M., Tice, M. D., and Baumeister, R. F. (1998). Self-Control as Limited Resource: Regulatory Depletion Patterns, *Journal of Personality and Social Psychology*, 74 (Mar), 774-789
- Muraven, M., and Baumeister, R. F (2000). Self-Regulation and Depletion of Limited Resources: Does Self-Control Resemble a Muscle? *Psychological Bulletin*, 126 (2), 247- 259
- Nagpal, A., Lei, J., and Khare, A. (2015). To Choose or to Reject: The Effect of Decision Frame on Food Customization Decisions. *Journal of Retailing*, 91(3), 422-435.
- Neumann, L. J., and Morgenstern, O. (1947). Theory of games and economic behavior. Princeton, NJ: Princeton University Press.
- Newell, B. R., and Shanks, D. R. (2003). Take the best or look at the rest? Factors influencing "one-reason" decision making. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 29(1), 53-65.

- Newell, B. R., Wong, K. Y., Cheung, J. C., and Rakow, T. (2009). Think, blink or sleep on it? The impact of modes of thought on complex decision making. *The Quarterly Journal of Experimental Psychology*, 62(4), 707-732.
- Newell, B. R., and Rakow, T. (2011). Revising beliefs about the merit of unconscious thought: Evidence in favor of the null hypothesis. *Social Cognition*, 29(6), 711-726.
- Nieuwenstein, M. R., Wierenga, T., Morey, R. D., Wicherts, J. M., Blom, T. N., Wagenmakers, E. J., and van Rijn, H. (2015). On making the right choice: a meta-analysis and large-scale replication attempt of the unconscious thought advantage. *Judgment and Decision Making*, 10(1), 1.
- Nordgren, L. F., Bos, M. W., and Dijksterhuis, A. (2011). The best of both worlds: Integrating conscious and unconscious thought best solves complex decisions. *Journal of Experimental Social Psychology*, 47(2), 509-511.
- Okada, E. M. (2005). Justification effects on consumer choice of hedonic and utilitarian goods. *Journal of Marketing Research*, 42(1), 43-53.
- Oppenheimer, D. M., Meyvis, T., and Davidenko, N. (2009). Instructional manipulation checks: Detecting satisficing to increase statistical power. *Journal of Experimental Social Psychology*, 45 (4), 867-872
- Paolacci, G.; Chandler, J.; Ipeirotis, P. (2010). Running experiments on Amazon Mechanical Turk. *Judgment and decision making*, 5(5), 411-419.
- Park, C. W., Jun, S. Y., and MacInnis, D. J. (2000). Choosing what I want versus rejecting what I do not want: An application of decision framing to product option choice decisions. *Journal of Marketing Research*, 37(2), 187-202.
- Payne, J. W. (1976). Task complexity and contingent processing in decision making: An information search and protocol analysis. *Organizational behavior and human performance*, 16(2), 366-387.
- Payne, J. W., Samper, A., Bettman, J. R., and Luce, M. F. (2008). Boundary conditions on unconscious thought in complex decision making. *Psychological Science*, 19(11), 1118-1123.
- Petty, R. E., Cacioppo, J. T., and Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of consumer research*, 10(2), 135-146.

- Rey, A., Goldstein, R. M., and Perruchet, P. (2009). Does unconscious thought improve complex decision making? *Psychological Research*, 73(3), 372-379.
- Rouse, S. V. (2015). A reliability analysis of Mechanical Turk data. *Computers in Human Behavior*, 43, 304–307.
- Runnion, B. M. (2009). Evidence for unconscious thought in complex decisions: The result of a methodological artifact or of an active thought process (Doctoral dissertation, Montana State University-Bozeman, College of Letters & Science).
- Sanna, L. J. (1996). Defensive pessimism, optimism, and stimulating alternatives: Some ups and downs of prefactual and counterfactual thinking. *Journal of personality and social psychology*, 71(5), 1020.
- Scheibehenne, B., Greifeneder, R., and Todd, P. M. (2010). Can there ever be too many options? A meta-analytic review of choice overload. *Journal of Consumer Research*, 37(3), 409-425.
- Schmeichel, B. J., Vohs, K. D., and Baumeister, R. F. (2003). Intellectual performance and ego depletion: role of the self in logical reasoning and other information processing. *Journal of personality and social psychology*, 85(1), 33.
- Schooler, J. W., and Melcher, J. (1995). The ineffability of insight. Smith, Steven M. (Ed); Ward, Thomas B. (Ed); Finke, Ronald A. (Ed). *The creative cognition approach*. (pp. 97-133). Cambridge, MA, US: The MIT Press, viii, 351 pp.
- Schwartz, B. (2000). Self-Determination: The Tyranny of Freedom, *American Psychologist*, 55 (1), 79–88.
- Sela, A., and Berger, J. (2012). How attribute quantity influences option choice. *Journal of Marketing Research*, 49(6), 942-953.
- Shafir, E. (1993). Choosing versus rejecting: Why some options are both better and worse than others. *Memory and Cognition*, 21(4), 546-556.
- Shafir, E., Simonson, I., and Tversky, A. (1993). Reason-based choice. *Cognition*, 49(1), 11-36.
- Shiv, B., and Huber, J. (2000). The impact of anticipating satisfaction on consumer choice. *Journal of Consumer Research*, 27(2), 202-216.

- Simon, H. A. (1955). A behavioral model of rational choice. *The quarterly journal of economics*, 99-118.
- Sloman, S. A. (1996). The empirical case for two systems of reasoning. *Psychological bulletin*, 119(1), 3.
- Slovic, P. (1982). Toward understanding and improving decisions. *Human performance and productivity*, 2, 157-183.
- Smith, S. M., and Blankenship, S. E. (1989). Incubation effects. *Bulletin of the Psychonomic Society*, 27(4), 311-314
- Sokolova, T., and Krishna, A. (2016). Take It or Leave It: How Choosing versus Rejecting Alternatives Affects Information Processing. *Journal of Consumer Research*, 43, 614-635.
- Spangenberg, E. R., Voss, K. E., and Crowley, A. E. (1997). Measuring the hedonic and utilitarian dimensions of attitudes: a generally applicable scale. *Advances in Consumer Research*, 24, 235-241.
- Srinivasan, N., and Mukherjee, S. (2010). Attribute preference and selection in multi-attribute decision making: implications for unconscious and conscious thought. *Consciousness and cognition*, 19(2), 644-652.
- Strahilevitz, M., and Meyers, J. G. (1998). Donations to charity as purchase incentives: how well they work may depend on what you are trying to sell. *Journal of Consumer Research*, 24, 434- 446
- Strick, M., Dijksterhuis, A., Bos, M. W., Sjoerdsma, A., Van Baaren, R. B., and Nordgren, L. F. (2011). A meta-analysis on unconscious thought effects. *Social Cognition*, 29(6), 738-762.
- Tauber, Edward M. (1972). Why do people shop? *Journal of Marketing*, 36(October), 46-49.
- Todd, P. M., and Gigerenzer, G. (2001). Putting naturalistic decision making into the adaptive toolbox. *Journal of Behavioral Decision Making*, 14(5), 381-382.
- Turnbull, P. W., Leek, S., and Ying, G. (2000). Customer confusion: The mobile phone market. *Journal of Marketing Management*, 16(1-3), 143-163.
- Tybout, A. M., Calder, B. J., and Sternthal, B. (1981). Using information processing theory to design marketing strategies. *Journal of Marketing Research*, 73-79.

- Tversky, A. (1972). Elimination by aspects: A theory of choice. *Psychological review*, 79(4), 281.
- Tversky, A., and Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185(4157), 1124-1131.
- Tversky, A., and Kahneman, D. (1986). Rational choice and the framing of decisions. *Journal of business*, S251-S278.
- Tversky, A., and Kahneman, D. (1981). Evidential impact of base rates (No. TR-4). Stanford University California department of psychology.
- Tversky, A., and Sattath, S. (1979). Preference trees. *Psychological Review*, 86(6), 542.
- Vosgerau, J., Dhar, R., Wertenbroch, K., and Bruyneel, S. (2008), Ego Depletion and Cognitive Load: Same or Different Constructs? in NA - Advances in Consumer Research Volume 35, eds. Angela Y. Lee and Dilip Soman, Duluth, MN: *Association for Consumer Research*, Pages: 217-220
- Wallace, H. M., and Baumeister, R. F. (2002). The effects of success versus failure feedback on further self-control. *Self and Identity*, 1(1), 35-41.
- Waroquier, L., Marchiori, D., Klein, O., and Cleeremans, A. (2009). Methodological pitfalls of the unconscious thought paradigm. *Judgment and Decision Making*, 4(7), 601-610.
- Wang, Z. J., Chan, K. Q., Chen, J. J., Chen, A., and Wang, F. (2015). Differential impact of affective and cognitive attributes on preference under deliberation and distraction. *Frontiers in psychology*, 6.
- Wedell, D. H. (1997). Another look at reasons for choosing and rejecting. *Memory and Cognition*, 25(6), 873-887.
- Wilson, T. D., and Schooler, J. W. (1991). Thinking too much: introspection can reduce the quality of preferences and decisions. *Journal of personality and social psychology*, 60(2), 181.
- Wilson, T. D., Lisle, D., Schooler, J. W., Hodges, S. D., Klaaren, K. J., and LaFleur, S. J. (1993). Introspecting about reasons can reduce post-choice satisfaction. *Personality and Social Psychology Bulletin*, 19, 331-339.

- Withrow, S. A., and Thorsteinson, T. J. (2009). Does unconscious thought outperform conscious thought on complex decisions? A further examination. *Judgment and Decision Making Journal*, 4(3), 235.
- Yaniv, I., and Schul, Y. (2000). Acceptance and elimination procedures in choice: Non complementarity and the role of implied status quo. *Organizational behavior and human decision processes*, 82(2), 293-313.
- Yaniv, I., Schul, T., Raphaelli-Hirsch, R., and Maoz, I. (2002), Inclusive and Exclusive Modes of Thinking: Studies of Prediction, Preference, and Social Perception during Parliamentary Elections, *Journal of Experimental Social Psychology*, 38 (July), 352–67.
- Zajonc, R. B. (1998). Emotions: The handbook of social psychology, Vols. 1 and 2 (4th ed.). McGraw-Hill, New York.
- Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American psychologist*, 35(2), 151.

APPENDIX A – CONSENT TERM

Online Consent Term

This research is anonymous and will be used for academic purposes only. Please pay attention when you are reading the questions and answering them in order to receive the payment for this study. You will spend about **XX minutes** to read and answer all questions. You will be paid a **US X.xx compensation** through Amazon's Mechanical Turk.

The participant who do not correctly answer the "Attention Check Questions" may have his/her date deemed invalid his/her payment may be withheld.

Your participation in this study is voluntary. You may decline to answer any question and you have the right to withdraw from participation at any time. If you do not want to participate, please close the browser window at this point.

The purpose of this study is to evaluate **how people make decisions about apartments**. In the next pages, we will present a variety of apartment features. Your attention during the task is very important to us.

You will be asked to participate in two different tasks. In the first task, you will be asked to form a global impression of each of four different apartments featuring different characteristics. The second task will be to assess perceptions about word-search puzzles.

In the next screens, we will present the two tasks sequentially and your job is to answer according to the instructions provided. Your attention during the tasks is very important to us. We thank you for agreeing to participate in this research. For any questions or doubt, please contact us.

Clécio Araujo
Terry College
University of Georgia
clecio.falcaoaraujo@uga.edu

- () I agree with this instruction.
() I **don't** agree with this instruction.

APPENDIX C – ATTRIBUTES ALTERNATIVES

APARTMENT “A” Filler alternative	Apartment “A” has a view to the park*
	The landscaping of apartment “A” is pleasant
	The landlord of apartment “A” is unkind
	Apartment “A” is relatively expensive
	Apartment “A” is relatively close to work or study*
	Apartment “A” has poor network signal
APARTMENT “B” Hedonic alternative	Apartment “B” has a view to the park*
	The landscaping of apartment “B” is pleasant
	The landlord of apartment “B” is kind
	Apartment “B” is relatively expensive
	Apartment “B” is relatively far from work or study*
	Apartment “B” has poor network signal
APARTMENT “C” Filler alternative	Apartment “C” has a view to the parking lot*
	The landscaping of apartment “C” is pleasant
	The landlord of apartment “C” is kind
	Apartment “C” is relatively cheap
	Apartment “C” is relatively far from work or study*
	Apartment “C” has strong network signal
APARTMENT “D” Utilitarian alternative	Apartment “D” has a view to the parking lot*
	The landscaping of apartment “D” is unpleasant
	The landlord of apartment “D” is unkind
	Apartment “D” is relatively cheap
	Apartment “D” is relatively close to work or study*
	Apartment “D” has strong network signal

Notes: * Apartment’s attributes used in the simple context

APPENDIX D – WORD-SEARCH PUZZLE

INSTRUCTIONS

The word-search puzzle task is composed of a 10x10 array of letters. Each letter in the puzzle is numbered so you can enter the range of numbers that contain the words you found.

For example, if the range of number containing the letters of the word "CARROT" is [84-89], you would enter this range in the box next to the word "carrot" (we will provide a visual example on the next screen).

The words come from three categories: countries (5), vegetables (5), and fruits (5). The words can follow any orientation (horizontal, vertical, or diagonal).

I ⁰¹	O ⁰²	L ⁰³	E ⁰⁴	T ⁰⁵	T ⁰⁶	U ⁰⁷	C ⁰⁸	E ⁰⁹	W ¹⁰
G ¹¹	T ¹²	U ¹³	A ¹⁴	Y ¹⁵	F ¹⁶	O ¹⁷	A ¹⁸	V ¹⁹	M ²⁰
E ²¹	A ²²	A ²³	Z ²⁴	O ²⁵	R ²⁶	A ²⁷	N ²⁸	G ²⁹	E ³⁰
R ³¹	T ³²	V ³³	L ³⁴	B ³⁵	A ³⁶	V ³⁷	A ³⁸	H ³⁹	L ⁴⁰
M ⁴¹	O ⁴²	E ⁴³	E ⁴⁴	Y ⁴⁵	N ⁴⁶	Z ⁴⁷	D ⁴⁸	T ⁴⁹	O ⁵⁰
A ⁵¹	P ⁵²	P ⁵³	L ⁵⁴	E ⁵⁵	C ⁵⁶	B ⁵⁷	A ⁵⁸	Q ⁵⁹	N ⁶⁰
N ⁶¹	A ⁶²	A ⁶³	C ⁶⁴	L ⁶⁵	E ⁶⁶	M ⁶⁷	O ⁶⁸	N ⁶⁹	A ⁷⁰
Y ⁷¹	F ⁷²	R ⁷³	T ⁷⁴	O ⁷⁵	M ⁷⁶	A ⁷⁷	T ⁷⁸	O ⁷⁹	P ⁸⁰
N ⁸¹	U ⁸²	G ⁸³	C ⁸⁴	A ⁸⁵	R ⁸⁶	R ⁸⁷	O ⁸⁸	T ⁸⁹	A ⁹⁰
O ⁹¹	N ⁹²	I ⁹³	O ⁹⁴	N ⁹⁵	Y ⁹⁶	P ⁹⁷	A ⁹⁸	V ⁹⁹	J ⁰⁰

CARROT [84-89]

APPLE [51-55]

CANADA [08-58]

LETTUCE [03-09]

GRAPE [83-43]

FRANCE [16-66]

ONION [91-95]

LEMON [65-69]

GERMANY [11-71]

POTATO [62-02]

MELON [20-60]

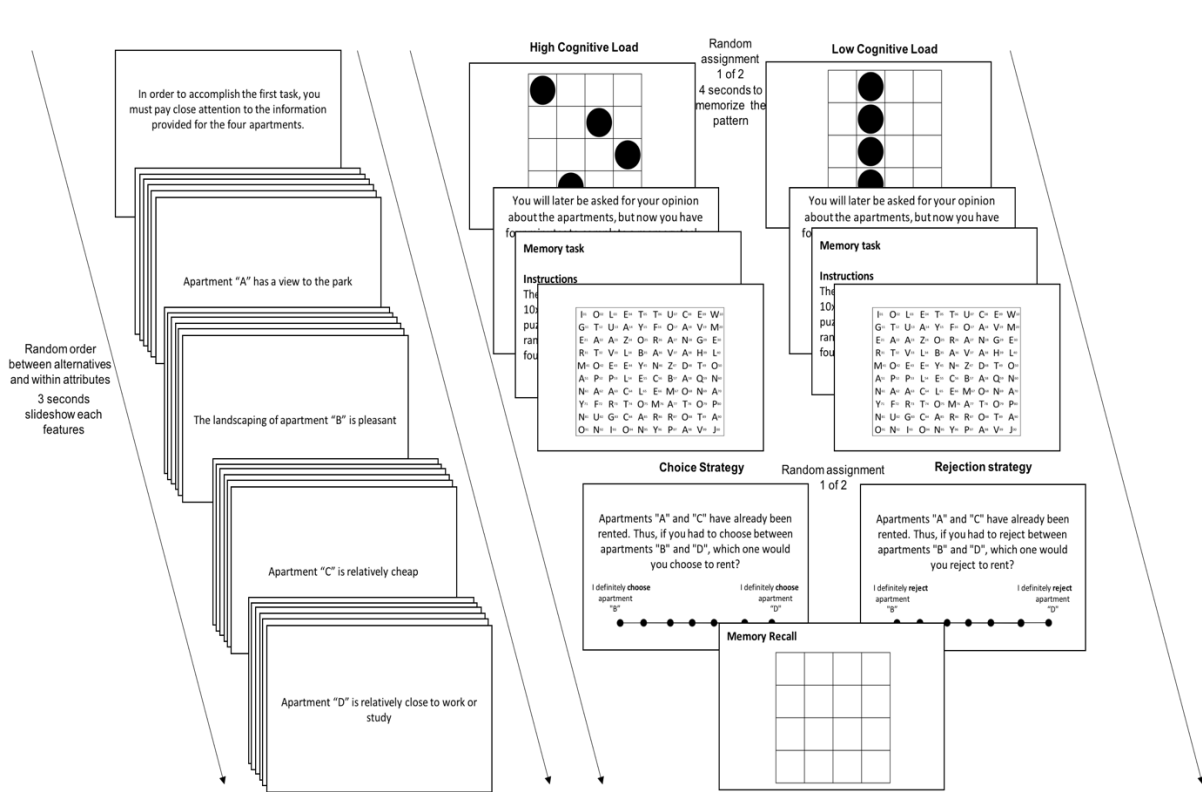
JAPAN [00-50]

TOMATO [74-79]

ORANGE [25-30]

ITALY [01-45]

APPENDIX E – EXPERIMENT FLOW STUDY 2



APPENDIX F – COGNITIVE LOAD MATRIX

INSTRUCTIONS

People often are busy or distracted while trying to remember things in real life. We are going to ask you to make a series of judgments and decisions while you try to remember a sequence of dots.

Next, there is a 4 x 4 array with 4 dots presented within 16 possible locations to memorize. You need to try to remember the location of the dots throughout the next tasks. You will be asked to recall the exact patterns of dots at the end of the study.

You have one second to memorize this matrix.

FIGURE A – LOW LOAD

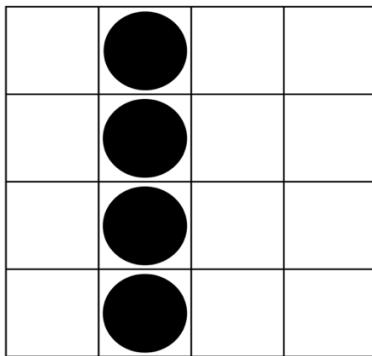
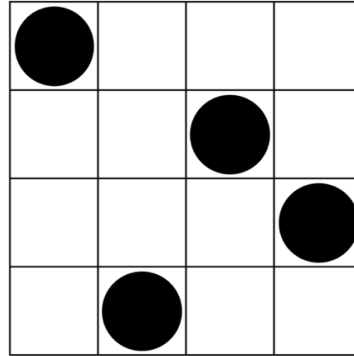


FIGURE B – HIGH LOAD



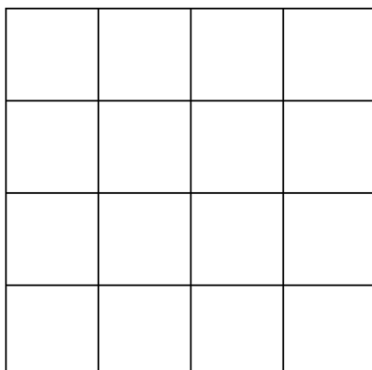
----- After distraction task and decision strategy -----

Recall task

Now you need to reproduce the initial pattern of dots you were asked to memorize by clicking on the squares that where the dots were positioned when you were asked to memorize their location.

There is no time limit on the pattern-reproduction task.

FIGURE C – BLANK MATRIX





Pontifícia Universidade Católica do Rio Grande do Sul
Pró-Reitoria de Graduação
Av. Ipiranga, 6681 - Prédio 1 - 3º. andar
Porto Alegre - RS - Brasil
Fone: (51) 3320-3500 - Fax: (51) 3339-1564
E-mail: prograd@pucrs.br
Site: www.pucrs.br