

CHOICE OVERLOAD AND MAKING DECISIONS FOR ONESELF AND OTHERS

**TWO EMPIRICAL STUDIES INVESTIGATING THE
IMPLICATIONS OF CONSTRUAL LEVEL THEORY ON CHOICE
OVERLOAD AND DECISION-MAKING**

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Master Thesis
Stockholm School of Economics
2021



Choice Overload and Making Decisions for Oneself and Others: Two empirical studies investigating the implications of construal level theory on choice overload and decision-making

Abstract:

Standard economic theory typically assumes that more is better, or at least not worse. However, there is growing evidence that when making decisions, more options can have negative implications such as decreased satisfaction or confidence for decision-makers. This phenomenon known as choice overload or overchoice is especially relevant as today's digitalized and globalized world provides decision-makers with seemingly endless arrays of choices. In previous overchoice research, one aspect has been largely neglected, namely decisions that are made for someone else. This thesis, therefore, sets out to contribute to the existing literature by investigating the overchoice phenomenon when decision-makers decide for others. Moreover, nobody has previously investigated the underlying process of decision-making under choice overload, and in this thesis this "black-box" shall be opened.

To investigate these aspects of decision-making, two quantitative studies, Study1 (n=166) and Study2 (n=89), were conducted. The evidence from these studies shows that more options can have negative impacts on choice satisfaction, perceived difficulty, confidence, as well as the willingness to revise a decision, and the enjoyment of making decisions. Generally, these negative impacts are mitigated when decisions are made for others. Hence, when decision-makers decide for another person, they are less subject to choice overload, although not all negative impacts of excessive options were offset. Study2 additionally showed that those deciding for others do not differ from those that decide for themselves, in terms of the quantity of information they request, and the type of information they use to derive decisions. This suggests no difference in the underlying process of decision-making under overchoice when decisions are made for someone else.

Keywords: Decision-making, choice overload, construal level theory, accountability

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Master Thesis

Master Program in Business & Management

Stockholm School of Economics

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1. Introduction

Picking presents can be a struggle, especially as the internet provides an astonishing number of options, just a few clicks away. With all the available options, why do we still so often decide to leave the decision to the giftee by gifting money or fall back to our emergency plan, picking up a bottle of wine and some chocolates on our way to the party?

Sometimes choices can overwhelm us, but does that come as a surprise? After all, we make countless of them every day. Fortunately, the majority of our decisions are automatized and we do not consciously realize we are making them (Hogarth, 2003). Then there are other choices which require more effort. These include deciding what kind of goals we want to pursue in life, or decisions we make for others, like the gift example illustrates. For such conscious decisions, we may engage in extensive decision-making processes, such as writing lists with pros-and-cons, and eventually, end up choosing the option that promises the highest satisfaction for us. Alternatively, for frequent decisions, we may develop shortcuts to conserve cognitive resources.

But how then do we deal with situations that are uncommon and in which we cannot simply go through all alternatives and easily identify the one that suits us best? Further, how do things change if it is not ourselves we are making the decision for, but someone else? The aim of this thesis is to shed more light on how abundant choices impact us. We hope that your decision to read this thesis, among the countless other things you could have done today, will be one you will rejoice.

1.1. Background

A conviction of standard economic theory and rationale behind modern market economies is that having many choices is better than having few. The underlying line of thought seems intuitive. To illustrate, following Besedeš et al. (2015), how can a large choice-set consisting of A, B, C, and D not be better than a subset consisting of A, B, and C? Freedom of choice and having more options is widely regarded by economists, policymakers, and consumers as being beneficial and hence desirable. Indeed, choices have many advantages, including promotion of competition and allowing people to choose options corresponding to individual preferences (Loewenstein, 1999; Schwartz et al., 2002). Consequently, it is not surprising that given the opportunity, people prefer to choose from many, rather than few alternatives. Decision-makers are attracted by the prospect of choices and derive utility from being free to choose (Beattie et al., 1994; Fasolo et al., 2007; Iyengar & Lepper, 2000; Liu et al., 2019).

Commonly, economic theory has drawn on *Rational choice theory* to explain decision-making. The theory assumes that individuals have clearly-set, consistent preferences and are able to rank alternatives based on the utility derived from them (Simon, 1955).

Furthermore, decision-makers are assumed to act under the imperative of making choices that maximize their utility, taking into account all available information (Gigerenzer & Goldstein, 1996; Schwartz et al., 2002). Thus, given the choice between options A and B, the decision-maker can either prefer one of the options or be indifferent, allowing no room for indecisiveness.

However, given the plethora and complexity of decisions that individuals must make in modern societies, rational choice theory struggles to keep pace. As, for example, Spotify offers listeners to choose from over 60 million tracks (Spotify AB, 2021) or Starbucks enables customers to modify beverages into more than 170,000 variations (Starbucks Corporation, 2019), standard theory discloses some weaknesses. These weaknesses are expressed in decision-making phenomena for which it fails to produce adequate explanations. Well-known examples of critics of standard theory include Nobel-laureates such as Simon or Kahnemann. Simon proposed the concept of *bounded rationality*, showing how people focus only on fractions of the given information and arguing how the mind adapts to the environment using his scissor metaphor (Gigerenzer & Goldstein, 1996; Simon, 1955, 1956). Likewise, most notably together with Tversky, Kahnemann showcased inconsistencies of decision-making, such as biases and heuristics, challenging foundations of standard theory (Tversky & Kahneman, 1986).

In similar spirit, a more recent string of research has challenged another, connected aspect of standard theory, which claims that more choices are always better. The debate concerning this conviction was initiated by the influential work of Iyengar and Lepper (2000), who presented empirical evidence that larger choice-sets can, opposed to the intuition presented before, result in undesirable outcomes for decision-makers. Iyengar and Lepper (2000) showed that individuals were more likely to decide and complete a purchase of jam and were more satisfied with their choice of chocolate if they had six options to choose from compared to 24 or 30. Additionally, Iyengar and Lepper (2000) found that a larger percentage of students wrote an extracurricular essay, and with objectively higher quality, when faced with six rather than 30 possible topics. These findings challenge the widespread ‘more is better (or at least not worse)’ paradigm, established in economic theory as well as in the reality of many modern societies. Building on these findings, this phenomenon known as overchoice or choice overload will be discussed extensively in the theory section of this thesis.

1.2. Problem Area

Research on choice overload, in general, is relatively plentiful and many researchers have substantiated the phenomenon in various decision-making scenarios as will be presented in the theory section. However, scarcity remains regarding important aspects of overchoice. Neglected by the majority of overchoice research is that choices are not only made by decision-makers for themselves but also for others (Polman, 2012a). Be it the

executive of a corporation, the consultant helping to turn-around a company, the parents selecting a school for their offspring, or the epidemiologist telling people how to minimize contagion of a virus. There are countless occasions where decisions are made for others but with the exception of Polman (2012a), this aspect has been largely neglected by overchoice research. This scarcity of research on decision-making for others in the face of choice overload is of significance, as Polman (2012a) has shown that decision-making for one-self versus others can have significant implications for the overchoice phenomenon. His findings suggest that when choices are made for someone else, more actually *is* better. For the much more studied self-decision choice overload hypothesis, there is some understanding regarding under which circumstances and to whom it applies. However, there is yet much to be researched in the case of making decisions for others. Furthermore, the process underlying choice overload is largely unexplored. To our knowledge, there are no published attempts of looking into the “black-box” that is the mind of decision-makers, neither in the case of overchoice in general nor particularly in the case of overchoice when deciding for others.

1.3. Purpose and Research Questions

Following the identified problem areas, with our thesis, we aim to investigate the overchoice phenomenon when decisions are made for someone else, as well as the underlying process. This will be done by answering the research questions motivated in the following section.

As decision-making for others and its relation to the overchoice hypothesis remains underexplored, as discussed in the previous section, we aim to contribute to filling this gap with our thesis. This will be done by building on, complementing, and challenging the findings by Polman (2012a). Hence, the first research question that we set out to answer is:

- 1) To what extent does the number of options impact the satisfaction of decision-makers deciding for themselves or others in line with the choice overload hypothesis?**

We attempt to find an answer to this question by conducting studies that require decision-makers to choose a holiday accommodation and a bottle of wine, either for themselves or others, as well as a charity to donate to, all from differently sized choice-sets.

Polman (2012a)’s proposedly altered effect of large choice-sets will be evaluated in a new setting, using multiple choice-set sizes. Additionally, we will study not only satisfaction but also perceived difficulty, confidence, willingness to revise decisions, and enjoyment of decision-makers. Thereby our study addresses two limitations of the work done by Polman (2012a), by explicitly going beyond satisfaction, and by using intermediate choice-set sizes. Investigating not only satisfaction but also the other mentioned reactions

of being exposed to choice overload, we hope to gain deeper insights into the phenomenon of overchoice and how it is altered as decisions are made for someone else. This leads to the second research question:

2) To what extent does self-/other decision-making impact reactions of being exposed to choice overload beyond satisfaction?

Further, given the absence of studies on the underlying process of choice overload, with a second study, we want to specifically look into the decision-making process in the context of differently sized choice-sets. While previous overchoice studies treated the mind of decision-makers as a “black-box”, we want to learn more about what happens when decision-makers face differently sized choice-sets, thereby generating insights into the underlying process of overchoice. Therefore, our third research question is:

3) To what extent does self-/other decision-making impact the amount and type of information decision-makers consider before choosing?

We attempt to answer this question with a second study, that again requires decision-makers to select a hotel either for themselves or for someone else. Contrastingly, in this second study the experimental design will be adjusted to track the decision-makers' process of deriving the made choice.

1.4. Definitions

In the following section, the terminology of this thesis and the most important concepts will be briefly explained.

Accountability: Being held accountable, that is having to defend or justify a decision vis-à-vis another person (Beattie et al., 1994), in this thesis that means towards the person that the decision is made for.

Agent Decision-Maker (ADM): A decision-maker deciding for someone else.

Agent Decision Maker with high Accountability (ADM-high): A decision-maker that is held accountable for the decisions made for someone else.

Choice overload / Overchoice: Two synonymous terms that describe the phenomenon of the availability of many options potentially having negative impacts on the decision-maker (Iyengar & Lepper, 2000; Scheibehenne et al., 2010).

Choice-set / Assortment: Synonymous terms that describe the portfolio of options that the decision-maker can choose from.

Construal Level Theory (CLT): A social psychology theory proposing that decision-makers that are psychologically distant from the decision to be made, interpret the

situation differently than those psychologically close. Consequently, distant decision-makers are expected to act differently than proximate decision-makers. Such psychological distance can for example be induced through temporal distance, spatial distance, or making decisions for someone else (Trope & Liberman, 2003). However, in this thesis, CLT and the concept of Psychological distance will be limited to making decisions for someone else.

Multivariate Multiple Regression Model (MMR): Regression model that allows the use of multiple dependent and multiple independent variables (Dattalo, 2013).

Personal Decision-Maker (PDM): A decision-maker making decisions for herself.

Psychological distance: The extent of distance between the decision-maker and the consequences of the decision (Trope & Liberman, 2003). See Construal Level Theory (CLT).

1.5. Delimitations

Aspects such as regret or cognitive dissonance (Festinger, 1957; Hinojosa et al., 2017) are not tested in our thesis, despite being interesting aspects of overchoice theory. Although many studies on overchoice do test for these aspects, really perceiving regret after making a decision should involve some time passing, which most of these studies do not account for. As the time horizon provided for the completion of this thesis allowed no longitudinal studies, this study will look into satisfaction, difficulty, confidence, revision, and enjoyment, but not regret or other reactions with a time-component.

Another delimitation of our thesis is that participants had to make decisions at all stages of the studies. Hence, the concept of choice avoidance such as deferring a decision, accepting the status quo, or in other ways opting out of choosing (Anderson, 2003; Broniarczyk, 2018; Chernev et al., 2015) were excluded from the thesis.

Further, like most other studies on overchoice, our decision-making scenarios are consumption-focused. Non-consumption scenarios such as, for example, impactful career decisions would certainly generate interesting insights, however, simulating such consequential decisions was not deemed realistic for this thesis.

While we study the impact of psychological distance on choice overload, this thesis is limited to one variant of distance, that is making decisions for others. Psychological distance can also be introduced by for example spatial or temporal distance (Pronin et al., 2008; Trope & Liberman, 2003), but these are out of scope for this thesis.

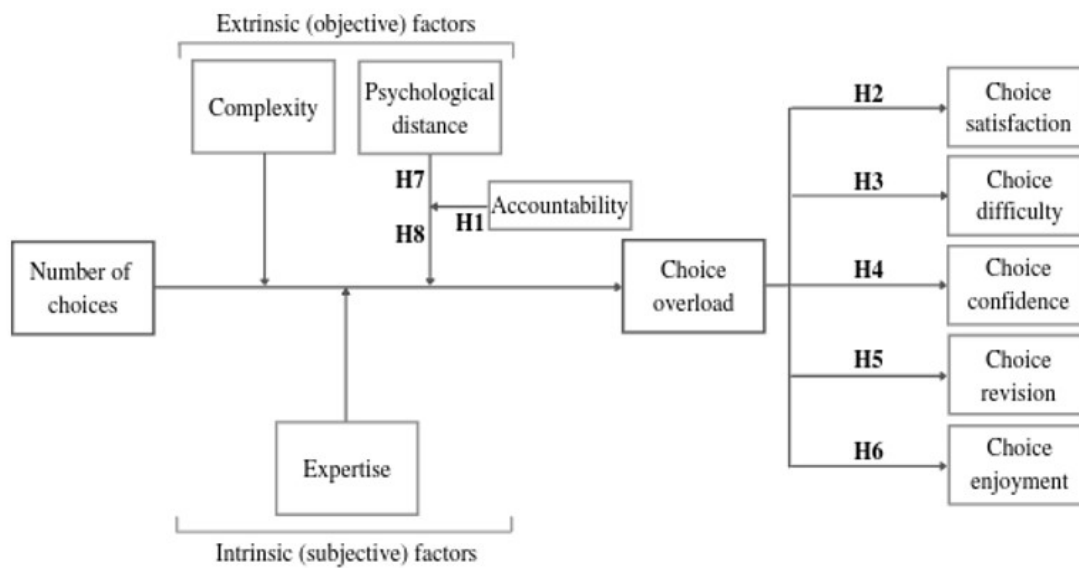
Finally, as for the underlying processes and the “black-box” of decision-making, only the considered percentage of options available, and the importance given to aspects of available information have been studied. Other aspects of the decision-making process will not be investigated in this thesis.

1.6. Thesis Outline

The remainder of this thesis will start by introducing the topic of choice overload and self-other differences in decision-making. This will be done by drawing on existing literature in these fields, based on which we developed a theoretical framework for hypothesis generation. After these hypotheses have been derived and presented, the applied methodology will be explained and the two studies that were conducted will be described. Subsequently, sections on analysis and discussion of the obtained results will follow. Finally, implications and limitations of the study will be discussed, and directions for future research indicated.

2. Theory and Hypothesis Generation

To address the research questions presented above, literature on overchoice and decision-making for others has been studied. Existing theory and findings are discussed and connected in this section to generate testable hypotheses. A visual overview of the developed theoretical framework, and how our hypotheses are connected, is presented in Figure1 below.



Note: As shown in Figure1, choice overload can be influenced by the number of choices (choice-set size), the complexity of the decision, the decision-maker's expertise in the area of choice, and psychological distance, which can be moderated through accountability. Choice overload, in turn, is then proposed to impact choice satisfaction, choice confidence, choice difficulty, choice revision, and choice enjoyment.

Figure1: Visual Representation of the Theoretical Framework

2.1. The Foundations of Choice Overload

The idea of suffering from too many choices and eventually ending up not choosing at all or being dissatisfied with the chosen option is nothing new. Already fourteenth-century philosopher Jean Buridan philosophized about a donkey being indecisive confronted with two equally attractive sources of nutrition (Park & Jang, 2013; Zupko, 2003). Given the abundance of choices in modern-day societies, the metaphorical dilemma of Buridan's donkey is more relevant than ever. The recent more intensive period of research on this phenomenon has become known as overchoice or choice overload. Parallel to the idea of Buridan, choice overload refers to the idea that abundance of options could lead to decreased ability to decide (Broniarczyk, 2018; Iyengar & Lepper, 2000; Loewenstein,

1999; Schwartz, 2016; Schwartz & Ward, 2004) as well as implications for choice-satisfaction, confidence, enjoyment, regret, perceived difficulty, or willingness to defer or revise choices (Chernev et al., 2015; Iyengar & Lepper, 2000; Schwartz, 2016).

In studies investigating the phenomenon, overchoice often refers to the inverted U-shape that describes the proposed relationship between the number of available options and the satisfaction derived from them. Proposedly, satisfaction with the made choice initially increases with choice-set size and then starts to decrease from a certain point forward (Chernev et al., 2015; Griffin & Broniarczyk, 2010; Szrek, 2017).

Such and comparable relationships between choice-set size and undesirable effects have been demonstrated in various decision-making scenarios. These scenarios range from consumer goods and public services (Beneke, 2015; Bollen et al., 2010; Iyengar & Lepper, 2000; Jilke et al., 2016), over dating (D'Angelo & Toma, 2017; Lenton et al., 2008; Pronk & Denissen, 2020), gambling (Haynes, 2009), or holiday decisions (Park & Jang, 2013), all the way to more substantial employment, retirement or volunteering decisions (Carroll et al., 2011; Iyengar et al., 2006; Iyengar & Kamenica, 2006; Schwartz, 2016). While overchoice is a general phenomenon that is proposed to impact all kinds of decision-makers, most studies focus on consumption of goods or services.

Nevertheless, it is interesting to acknowledge that overchoice proposedly impacts decision-makers in all situations of life, not just consumption. Prominently, Lenton et al. (2008) explored the overchoice phenomenon beyond a classic consumption setting, investigating the detrimental effects of increasing choice-set size in the context of online-dating. In a first study, Lenton et al. (2008) asked participants to indicate their preferred choice-set size, among sets ranging from one to 5000 options. Participants were subsequently asked to report their expectations regarding satisfaction, difficulty, regret, and enjoyment. In a second study, participants had to select a person they wanted to date from differently sized choice-sets, amongst them the choice-set that participants expected to be ideally-sized in the first study. This second study showed that participants overestimate the choice-set size at which marginal costs exceed the marginal benefits of additional choice, with the result of decreased satisfaction and enjoyment, as well as increased difficulty and regret. Lenton et al. (2008) rationalized these results through the increased use of superficial heuristics in the context of large choice-sets and the higher likelihood of missing the optimal alternative.

It should be noted that while the phenomenon of choice overload has been demonstrated in diverse decision-making scenarios, not everyone is convinced of its validity. Scholars researching the phenomenon have thus clustered into two factions with opposing opinions. Their back-and-forth including inconclusive meta-studies, trying to generalize findings and conditions for overchoice, as well as the failure to replicate results, are both causes and symptoms of the debate on whether overchoice is real or not (Chernev et al., 2010, 2015; Scheibehenne et al., 2010).

As major representatives of the skeptical faction, Scheibehenne et al. (2010) found that the mean effect of overchoice across 50 studies is practically zero, hinting that the hypothesis does not hold on a more general level. They argue that if generally reducing the number of options would lead to improved decision-making, satisfaction, etc., as claimed by the overchoice hypothesis, then businesses could obtain a competitive advantage by simply decreasing the range of options they offer to customers. Following overchoice theory, this argument should hold in the context of abundant options we face today. Illustrating with the example of Iyengar and Lepper (2000); why do jam producers with excessive options not simply get outcompeted by those that recognize the implications of overchoice for their business models? Scheibehenne et al. (2010) emphasize this contradiction, underlining their argument by citing evidence for how instead giving customers many options ensues a competitive advantage, allowing to satisfy heterogeneous customer needs (Arnold et al., 1983; Bown et al., 2003; Craig et al., 1984; Koelemeijer & Oppewal, 1999; Koelemeijer & Oppewal 2005, as cited in Scheibehenne et al., 2010). Parallel arguments can be brought forward for non-consumption decisions, questioning the general validity of overchoice. Furthermore, Scheibehenne et al. (2010) explore the conditions under which individual studies attempt to substantiate the overchoice hypothesis. They identify some necessary conditions such as requiring decision-makers to have no pre-defined preferences or the absence of dominant options. Scheibehenne et al. (2010), however, point out that there seem to be no sufficient conditions. This means that despite recreating the conditions under which overchoice has previously occurred, there is no guarantee, which has led to the problem of obtaining comparable results in attempted replications and embodies a major argument of those skeptical of overchoice.

Chernev et al. (2010) provided a response to the findings of Scheibehenne et al. (2010), claiming that the presented overall negligible mean result is rather meaningless. Further, they claim that this mean result is inherent to the simplifying assumptions that Scheibehenne et al. (2010) based their meta-analysis on and less rooted in the proposed questionable validity of overchoice. This criticism was followed up by a new meta-study that unlike Scheibehenne et al. (2010) claims to account for the specific nature of overchoice (Chernev et al., 2015). In this newer study, the quest to identify sufficient conditions of choice overload, as pursued by Scheibehenne et al. (2010), is considered quixotic, as it is highly unlikely that there exists a row of conditions that will, when met, *always* lead to overchoice. In the words of Chernev et al. (2010), “the impact of even the most robust predictors can be reduced, eliminated, or even reversed in certain scenarios, there are very few (if any) behavioral phenomena for which sufficient conditions could be identified” (Chernev et al., 2010, p. 427). Therefore, the more extensive and arguably more sophisticated meta-study conducted by Chernev et al. (2015) counters the findings by Scheibehenne et al. (2010), concluding that overchoice is a valid phenomenon that does exist, although not for everyone under all circumstances (Chernev et al., 2010, 2015).

Faced with these two opposing factions in the overchoice literature, we, based on personal experience, believe that there are situations in which too much choice can lead to undesirable results. Hence, we believe that choice overload exists in certain situations, leaning towards the view of Chernev et al. (2010, 2015), but acknowledge the criticism towards and the hard-to-grasp nature of the phenomenon.

2.2. Making Decisions Under Choice Overload

Following the reasoning of standard economics and rational choice theory, it is largely taken for granted that having choices is good and that having more is better (Loewenstein, 1999; Schwartz & Ward, 2004). The reasoning behind this conviction is intuitive. When decision-makers can, as assumed under rational choice theory, without incurring any costs, unambiguously rank alternatives based on complete consistent preferences, more options should always be desirable for utility-maximizing decision-makers. Or at least, they should not make them worse-off (Schwartz et al., 2002).

Indeed, benefits of being able to choose exist, both in terms of the decision process and its outcomes. Firstly, larger choice-sets are regarded as more stimulating, giving the perception of increased possibility, control, and freedom of choice. This in turn is believed to enhance the satisfaction derived from the choosing process. Secondly, choice enhances the result of the decision-making process, since an option chosen from a larger choice-set more likely matches individual preferences (Broniarczyk, 2018; Schwartz, 2016). Corresponding empirical evidence has been presented, showing that decision-makers have expressed preference for larger choice-sets, for example, consumers being drawn to stores with larger product ranges (Broniarczyk, 2018). Similarly, laboratory studies requiring participants to perform tasks, have recurrently found that being given options increases the intrinsic motivation, participants' perceived control, and leads to improved task performance connected to the decision. However, when participants go from being presented with an option to being required to choose from multiple options, things can change (Broniarczyk, 2018; Iyengar & Lepper, 2000)

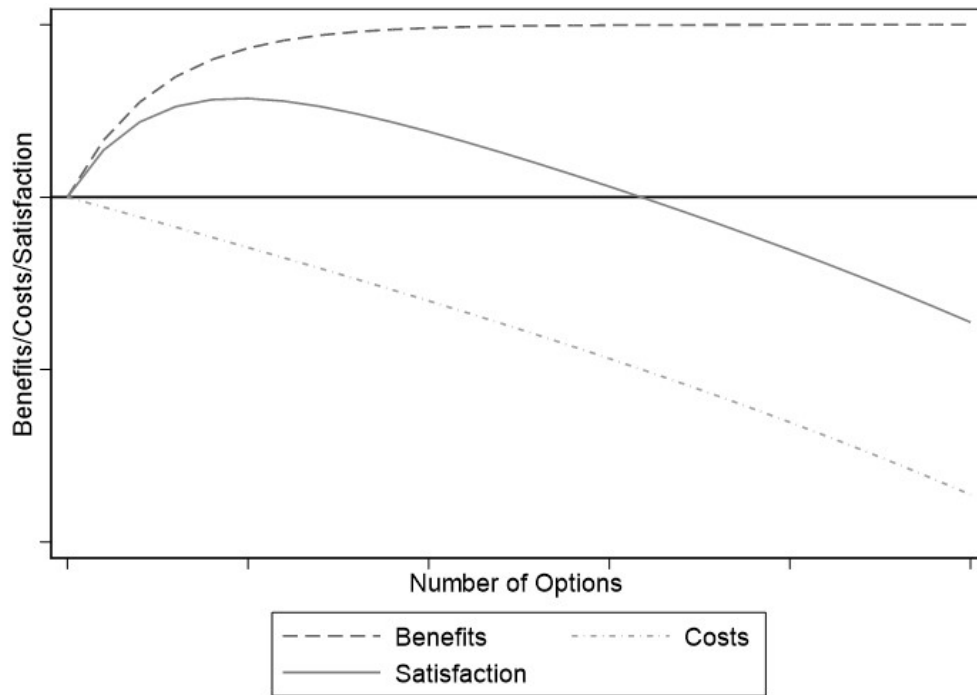
Specifically, the relationship between the number of options and the implications for decision-makers might not be as monotone as standard theory suggests. Increasing the number of choices does not come without downsides, as too many options can create costs ranging from additional time, over cognitive efforts, to psychological repercussions (Chernev et al., 2015; Loewenstein, 1999; Nobel, 2020; Schwartz et al., 2002; Schwartz, 2016). Additionally, lack of expertise¹ implies a tendency of making suboptimal choices, which can lead to additional costs or errors, especially when confronted with large choice-sets (Loewenstein, 1999; Schwartz, 2016). Accordingly, there is evidence that people

¹ Expertise is defined by the Oxford dictionary as “expert knowledge or skill in a particular subject, activity, or job” (Oxford Dictionary, 2021). A lack of expertise is troublesome independent of the size of a choice-set. However, as the choice-set increases people consider fewer available options and use simpler rules for making the decision. This makes the lack of expertise detrimental especially in the case of large choice-sets (Loewenstein, 1999).

make objectively worse decisions when faced with increasingly large choice-sets (Besedeš et al., 2015). This is in line with the ‘less-is-more’ effect which has shown that people make objectively better decisions when taking less, rather than more information into account (Fasolo et al., 2007; Gigerenzer & Goldstein, 1996). Some scholars draw a line between choice overload and information overload. Whereas the former refers to the negative consequences of facing an excessive number of options, the latter is concerned with abundant information having similar effects on decision-makers (Park & Jang, 2013). However, we follow the reasoning by Chernev et al. (2015), arguing that excessive information and complexity implied by large choice-sets are a moderator of why people experience choice overload.

Another aspect that adds to the more complicated relationship between the number of choices and implications for decision-makers is that frequently options are mutually exclusive. Hence, once a decision is made, all other options are given up, meaning one foregoes the potential benefits of such alternatives. Such opportunity costs further increase the pressure to make the ‘right choice’ which can lead to decision anxiety, fear, and deferral (Broniarczyk, 2018; Loewenstein, 1999; Schwartz & Ward, 2004). Therefore, as the attractiveness of alternatively available choices rises, decision-making becomes more difficult due to opportunity costs. Accordingly, the propensity of decision-makers to choose the default option, opt-out, or continue to search without deciding increases, while satisfaction with the made choice decreases, as decision-makers face all the benefits provided by non-chosen alternatives (Broniarczyk, 2018; Iyengar & Lepper, 2000; Loewenstein, 1999). Hence, as the number of choices increases, so do the cognitive efforts of identifying the optimal choice as well as the opportunity costs of foregone options, thereby inducing feelings such as dissatisfaction and regret (Broniarczyk, 2018; Carroll et al., 2011; Loewenstein, 1999; Schwartz, 2016; Schwartz & Ward, 2004).

Combining the above-mentioned benefits and drawbacks of increasing choice-set size, overchoice theory proposes the relationship depicted in Figure2, which will be explained subsequently. Prior research has shown that the benefits derived from increasingly large choice-sets are likely to be characterized by diminishing returns. This means, as the number of options increases, the added value of each marginal option is smaller than the former (Chernev et al., 2015; Nobel, 2020). There is no reason to assume that marginal costs, such as cognitive or opportunity costs as explained above, are likewise diminishing. Consequently, at some point, marginal costs may exceed the marginal benefits of additional choice (Chernev et al., 2015). This proposed relationship can be seen in Figure2. Initially, the benefits of additional choice overcompensate the implied costs, the net result being heightened satisfaction. The marginal benefits of additional choice then decrease, leading satisfaction to peak and subsequently decline gradually. Result of this development is the inverted U-shape suggested by proponents of overchoice theory.



Note: The hypothesized relationship between the number of options, benefits, costs, and the resulting U-shaped satisfaction. Adapted from Bollen et al. (2010).

Figure2: Hypothesized reaction when the number of options increases

The previously mentioned meta-study by Chernev et al. (2015) identified four key factors that are likely to moderate this phenomenon. Namely, (1) *decision task difficulty*, (2) *choice-set complexity*, (3) *preference uncertainty*, and (4) *decision goal*. These four factors, given large choice-sets, proposedly can induce choice overload. Each of the key factors includes several underlying moderators. *Decision task difficulty* and *choice-set complexity* are both considered objective, extrinsic factors, as they concern what is decided upon rather than the decision-maker. (1) *Decision task difficulty* focuses on the hardships of choosing, such as how much time it requires, the decision accountability, as well as how many attributes are presented for each option. (2) *Choice-set complexity*² includes features of the choice-set, as well as aspects of individual options, such as whether one option is dominant, and the overall attractiveness of the set. *Preference uncertainty* and *decision goal* are considered subjective, intrinsic factors, as they relate to the decision-maker. (3) *Preference uncertainty* refers to the knowledge of the decision-maker, more specifically the person's expertise in the decision area, and how well-defined attribute preferences and trade-offs are. Finally, (4) *decision goal* relates to the decision-

² Loewenstein (1999) elaborated on the implications of complexity of large choice-sets for processing costs and emotional responses such as anxiety and regret. High complexity increases the likelihood of decision-makers using cognitive shortcuts and heuristics, considering only fragments of the information provided by extensive choice-sets (Gigerenzer & Gaissmaier, 2011; Gigerenzer & Goldstein, 1996; Payne, 1976).

makers intentions and is determined by subjective targets. Such could be browsing versus buying, or choosing between assortments versus choosing an option from a given assortment (Chernev et al., 2015). Whereas the presented meta-study provides an overarching view of factors impacting overchoice, we have approached the factors and moderators slightly differently. For this thesis, *complexity* will henceforth refer to aspects such as the information regarding options, attributes and number of attributes, absence of dominant options in the choice-set, and alignability.

While Chernev et al. (2015) propose these four factors that moderate overchoice based on the 99 studies included in their meta-study, the warning by Chernev et al. (2010) should be heeded. That is, it is presumptively impossible to identify sufficient conditions for overchoice. Hence, neither the four factors by Chernev et al. (2015), nor the aspects that we present in this theory section claim to encompass all factors that could lead to, influence, or even guarantee the phenomenon of overchoice. For example, the magnitude of the consequences of a decision likely also plays a role in the phenomenon. Low-impact decisions remade frequently, are less likely to evoke overchoice than significant ones with considerable, potentially long-lasting impacts (Schwartz, 2016). For instance, a low-impact decision would be deciding which yogurt to purchase in the supermarket. It is a low-cost, non-durable good, and most likely not a life-changing decision. Meanwhile, decisions regarding one's partner, career, or purchases of durable goods, are considered more impactful and challenging, and hence more likely lead to overchoice. Nevertheless, choice overload also occurs in less-substantial decision-making scenarios, as has been shown most prominently by the jam-study of Iyengar and Lepper (2000). After having introduced the concept and relevant literature on overchoice, we will now continue with introducing the second important block of theory that will be required to answer our research questions. That is, theory on how decision-making differs if decisions are made for others.

2.3. Making Decisions for Others

Dating back at least to ancient thinkers such as Confucius, and taught in some variety in every major religion, the *golden rule*, states that one should treat others as one wishes to be treated (Kray, 2000; Wattles, 1996). While this straightforward rule of morality would predict that people treat others as they treat themselves, there is evidence that differences exist in how people make decisions for themselves compared to how they decide for others.

Individuals act differently when making decisions for others in all three phases stylizing the decision-making process; the pre-decision, decision, and post-decision phase (Kray, 2000; Lu et al., 2013). Studies have shown numerous self-other differences, such as in the quantity and type of information that decision-makers request and process (Kray, 2000; Lu et al., 2013; Polman, 2010, 2012b; Polman & Wu, 2020; Stone & Allgaier,

2008), how they are affected by behavioral biases (Polman, 2010; Polman & Emich, 2011; Polman & Vohs, 2016; Pronin et al., 2008), how emotions connected to decision-making such as guilt, regret or anxiety are experienced (Beattie et al., 1994; Lu et al., 2016; Polman & Emich, 2011; Polman & Vohs, 2016; Wray & Stone, 2005), which kind of options are preferred (Lu et al., 2016; Polman & Wu, 2020), and most importantly for this thesis, how situations of overchoice are dealt with (Polman, 2012a). For the sake of readability, decision-makers making decisions for themselves will henceforth be called *PDMs* (Personal Decision-Makers), those making decisions for others *ADMs* (Agent Decision-Makers).

A theoretical explanation that is frequently brought forward by authors that discovered the above-mentioned differences is that of construal level theory (CLT)³. CLT argues that a decision-making scenario can be construed differently, based on the extent of psychological distance between the decision-maker and the consequences of the decision. Although this thesis is limited to psychological distance infused by making decisions for someone else, psychological distance can also be created by other facets of distance such as temporal or spatial distance (Pronin et al., 2008; Trope & Liberman, 2003). CLT's main argument is that the same information is interpreted differently by decision-makers proximate, or far away from a decision. High distance, 'high-level construal', directs attention towards abstract information, detached from the immediate context, trying to capture the gist of what characterizes an option. Meanwhile, low distance, 'low-level construal', is geared towards the context, subjective experience, and the details of an alternative (Pronin et al., 2008). Metaphorically, those close to the decision see the pixels, the complexity, meanwhile those less proximate see the entire picture from farther away.

An example is the previously mentioned study by Polman (2012a), who, like us, looked into decision-making differences of PDMs and ADMs in situations of overchoice. Polman (2012a) did so by investigating decisions ranging from choosing paint swatches and wine to selecting university courses. From these scenarios, Polman (2012a) presented evidence for overchoice amongst PDMs and for reversed choice overload effect among ADMs. Meaning, those choosing for others derived higher satisfaction choosing from larger choice-sets compared to smaller ones, countering the findings of Iyengar and Lepper (2000). Polman (2012a) explained this overchoice reversal with the different way ADMs and PDMs construe a decision-making scenario. Manipulating accountability, and

³ Other popular explanations for the differences in decision-making for others versus for oneself include the social-values explanation, stating that when decision-makers make decisions for others they adhere stricter to social values as they want to avoid blame and deterioration of the relationship with the person the decision is made for (Stone & Allgaier, 2008). Another example are emotional theories which state that the emotions that ADMs feel during decision-making are fundamentally different from those of PDMs and hence lead to other decisions (Polman & Wu, 2020). Among these possible explanations for why decisions are different for ADMs vis-à-vis PDMs, CLT has been selected, as it is the most versatile. For instance, it allows explanations of differences when decision-makers are anonymous, something that the social-values explanation struggles to do. Moreover, CLT best reflects the variety of fields in which overchoice has been shown to occur.

thereby decreasing psychological distance for ADMs, Polman (2012a) showed how this reduced distance led to ADMs behaving more like PDMs and thereby getting impacted by choice overload when choosing from large choice-sets.

2.4. Effects of Overchoice & Psychological Distance

The following section will combine the two presented blocks of theory, overchoice and making decisions for others, to derive hypotheses with the aim of furthering the understanding of overchoice. While choice overload can have several undesirable implications for decision-makers, as summarized by Chernev et al. (2015), these effects are not clear-cut but instead often interrelated. In combination, they explain why sometimes more can be less.

2.4.1. Decision-Making Outcomes

Accountability

Based on the argumentations of CLT, increased accountability should bring the consequences of decisions closer to the ADM, decreasing psychological distance, which in turn alters construal. To differentiate ADMs that are held accountable from those that are not, we introduce specific terminology. While ADM still refers to a decision-maker deciding for someone else, an ADM facing high accountability will be referred to as *ADM-high*. Thus, unless explicitly stated differently, the general term ADM refers to a decision-maker deciding for someone else in the context of low-accountability. Because the ADM-high is held accountable for decisions, despite not being directly impacted by a decision, consequences are still felt by the ADM-high. This could for instance mean that the ADM-high must justify her decision. Thus, accountability leads to higher stakes for the ADM-high. Consequently, following CLT, accountability should decrease psychological distance, which should make ADM-highs behave more as if they were deciding for themselves. Therefore, we expect that:

H1: ADM-highs' decision-making should be similar to that of PDMs.

Satisfaction

Previous decision-making research has argued that simply having more options to choose from increases satisfaction with the decision made (Broniarczyk, 2018; Chernev et al., 2015; Loewenstein, 1999; Reutskaja & Hogarth, 2009). However, the relationship might not be as monotone as expected, especially when considering psychological distance.

Commencing with the impact of more choices for PDMs. As choice-set size increases, expectations of finding the perfect option rise likewise (Lenton et al., 2008). This consequently makes it more likely that the chosen option falls short of the heightened

expectations, resulting in lower satisfaction with the made choice. The main reasons behind lower satisfaction are time constraints, and option alignability (Chernev et al., 2015). The limited-time aspect has shown to lead to less systematic evaluation of available options, which in turn leads to self-doubt regarding whether better options were available. Option alignability amplifies this, as options in high-alignability choice-sets feature similar attributes, making it more difficult to detect subtle differences and to identify the single best option (Chernev et al., 2015). Dissatisfaction with the decision can eventually culminate into psychological costs such as increased risk of depression, anxiety, and lower well-being (Loewenstein, 1999; Schwartz et al., 2002; Schwartz, 2016). Thus, when increasing choice-set size, different mechanisms operate. The conventionally expected result of more options would be that satisfaction from the chosen option will increase due to the larger likelihood of finding an option fitting personal preferences. This beneficial effect can be expected to be strongest when choice is limited. As illustrated in Figure 2, an additional option proposedly implies high marginal benefit in such circumstances, as it is more likely to comprise attributes not yet existent in the choice-set. In the context of small choice-sets, this effect is expected to overcompensate bespoke detrimental effects. However, as visualized in Figure 2, as the choice-set exceeds an ideal size, more choices are expected to lower the satisfaction of decision-makers due to additional costs, low marginal benefit, and subjective cognitive implications. In other words, past a tipping point, marginal costs outweigh marginal benefits, leading to decreased satisfaction. Following this reasoning and anticipating ADM-highs to behave like PDMs, we expect that:

H2a: PDMs' and ADM-highs' choice satisfaction will first increase, then decrease as choice-sets become increasingly large.

Generally, the same effects such as heightened expectations or alignability are expected to be at work for ADMs. However, CLT predicts that ADMs who are far away from the consequences of a decision are focused on *what* they want, the desirability of an alternative, and the benefits it promises. Concurrently, PDMs, and thus proposedly also ADM-highs, are more occupied with the feasibility-aspects of an option, that is *how* realizable an option is for them (Lu et al., 2013; Trope & Liberman, 2003). Hence following CLT, it is expected that ADMs are more occupied with the potential benefits to gain and are less risk-averse. This rationalizes the findings by Lu and Xie (2014), who have shown that ADMs are more likely to make active decisions diverting from the status quo. Such argumentation is also in line with the findings of Polman (2012a) in the context of overchoice. He showed that psychological distance, induced by making decisions for others, alters the regulatory focus (Mogilner et al., 2008) of decision-makers. Essentially, ADMs are predicted to adopt a promotion-focus, emphasizing the potential gains of options with the objective of achieving a positive outcome, hence choosing an option that satisfies needs. Meanwhile, PDMs, taking up a prevention-focus, emphasize what they

want to avoid, namely making a less-than-optimal choice. With the number of choices increasing, the probability of selecting a nonoptimal alternative rises, with the implications for PDMs discussed above. However, with more options available, it also becomes more likely that the choice-set contains one or several options that satisfy needs. Therefore, unlike for PDMs and ADM-highs, the likelihood that ADMs are satisfied with the chosen option should increase with choice-set size, due to the impact of psychological distance on the construal of the decision-making scenario. Following this theoretical reasoning, we expect that:

H2b: ADMs' choice satisfaction will increase with choice-set size.

Choice Difficulty, Confidence, and Revision

As the number of options increases, decisions become more complex and time-consuming. Differences between options become subtle, as options become increasingly similar. Consequently, trade-offs become more difficult and opportunity costs of choosing rise, as the second-best option is likely similarly attractive to the best. Following this argumentation and again anticipating that PDMs and ADM-highs behave similarly, we expect that:

H3a: PDMs and ADM-highs experience more difficulties when making decisions from increasingly large choice-sets.

While ADMs with low accountability theoretically face the same consequences of increased choice-set size on complexity and opportunity costs, increased psychological distance is predicted to lead to ADMs acting differently. Meaning, ADMs differ from PDMs, and thus ADM-highs, not only in the decisions they make and how satisfied they are with them, but also in the process of deriving them. Due to a higher level of psychological distance and thus altered construal, ADMs are expected to be less preoccupied with details of the alternatives and are focused more on the broad abstract characteristics of options (Fujita et al., 2006; Lu et al., 2013; Trope & Liberman, 2003). Following this and the argumentation of promotion-focus that ADMs are expected to adopt due to the increased psychological distance, more choices should not make the decision more difficult for ADMs. Hence, it is expected that:

H3b: Experienced decision-making difficulty does not increase for ADMs as choice-set size increases.

As the number of alternatives increases, so does the amount of information to consider when deciding, leading to more difficulties as explained above. Further, it has been shown that when facing abundant information, not all available data is considered (Gigerenzer

& Goldstein, 1996), as processing capacity is limited (Simon, 1955, 1956) and time-invested present opportunity costs (Loewenstein, 1999). As choice-set size increases, this less thorough inspection of available options and decreased likelihood of selecting the best option by chance should reduce decision confidence. In other words, it is expected that larger choice-sets lead to disregarding of information, and decreased likelihood of identifying the option that best fits individual preferences. This should decrease confidence with the made decision. Such decreased confidence seems to be a reasonable outcome, as decision-makers facing large choice-sets perceive them as being more difficult and end up making objectively worse choices (Besedeš et al., 2015; Lenton et al., 2008). As it becomes more difficult to identify the single-best option, and the likelihood of choosing the single-best option decreases, an increasing choice-set size should undermine the confidence of having chosen the best option. Taking this into account, and again anticipating that PDMs and ADM-highs behave alike, we expect that:

H4a: Choice confidence of PDMs and ADM-highs will decrease as the choice-set size increases.

As previously stated, construal for psychologically-distant ADMs is less geared towards details and more towards the broad abstract characteristics of options (Pronin et al., 2008). This implies that ADMs are less thorough in their inspection of options, as they disregard more detailed information, which is less important for their decision-making, regardless of choice-set size. Therefore, ADMs are expected not to get lost in the details and complexities of large choice-sets, as they construe the decision-making scenario differently. Moreover, as psychological distance is expected to result in ADMs adopting a promotion-focus (Polman, 2012a), ADMs should be less occupied with selecting the single-best option anyway. Hence, psychological distance again is expected to mitigate the effects of large choice-sets for ADMs and we expect that:

H4b: Choice confidence of ADMs will decrease less than for PDMs and ADM-highs as the choice-set size increases.

Other things equal, being less confident that the chosen option was the best one available should make decision-makers more willing to revise the choice they made. This is due to the likelihood that, provided more time, they could find an option that suits individual preferences better than the chosen option. Therefore, considering the prior argumentation regarding confidence, we expect:

H5a: The willingness to revise a choice will increase as the choice-set size increases for PDMs and ADM-highs.

H5b: The willingness to revise a choice as the choice-set size increases will increase less for ADMs than for PDMs and ADM-highs.

2.4.2. Decision-Making Process

Enjoyment, Percentage of Considered Options, and Considered Information

In contrast to satisfaction, which can be understood as the satisfaction with the chosen option, enjoyment focuses on the process of decision-making. That is, whether the decision-maker enjoys the process of choosing between the options provided in her choice-set. As has been explained before, making decisions does not come without costs, such as cognitive-, or opportunity costs. Therefore, it should not be surprising that decision-making is not always pleasant, and people report decision-making fatigue (Bettman et al., 1998). Costs such as cognitive effort or time-related opportunity costs should increase along with choice-set size. Therefore, as decisions become increasingly difficult and demanding, enjoyment should decrease. It has been shown, however, that the displeasure of decision-making is alleviated by feelings of power, easy trade-offs, abstraction, and positivity during the choice process (Polman & Vohs, 2016).

Thus, again increased psychological distance of ADMs is likely to play a role as it eases the difficulty of trade-offs, ADMs focusing on abstract categories (Pronin et al., 2008; Trope & Liberman, 2003). Psychological distance is also expected to mute negative aspects of alternatives more than positive ones. Thereby, alternatives that have both desirable and undesirable attributes should become more attractive for ADMs than for PDMs (Trope & Liberman, 2003). Such reasoning is also consistent with ADMs being less risk-averse, as potential negative aspects of options are subordinated (Polman & Wu, 2020; Stone et al., 2013). Further, as ADMs structure information into fewer abstract categories (Pronin et al., 2008; Trope & Liberman, 2003), in the context of large choice-sets, ADMs should be more efficient identifying options that deserve closer inspection. This should allow easier, more enjoyable decision-making as well as reduced afterthoughts and doubts for ADMs. This is a consequence of decisions being made based on underlying, abstract preferences and less on subjective, current emotions, and ambiguous preferences that the PDM and proposedly also the ADM-high, is subject to. Hence, it is expected that:

H6: ADMs' decision enjoyment will decrease less when choice-set size increases than PDMs'.

The argumentation that has been made in the previous section about the impact of psychological distance on satisfaction also applies to the process of deriving decisions. As has been explained above, as a result of varying degrees of psychological distance, PDMs are expected to be prevention-focused, ADMs promotion-focused (Polman, 2012a). In consequence, ADMs are expected to only acquire information about additional

options if the ones they have looked at were unsatisfactory. In contrast, PDMs, are expected to try to prevent choosing a nonoptimal option. To minimize the likelihood of selecting such an option, PDMs should want to look at the information of all available options to make sure that their option is the best one available. Given this proposed impact of psychological distance, we expect that:

H7: PDMs look through a larger percentage of their available options than ADMs.

Finally, our last hypothesis concerns the kind of information that PDMs and ADMs consider when making their decision. That is, what information is important for which group of decision-makers in the process of deriving decisions in differently sized choice-sets? As has been pointed out before, CLT predicts ADMs to focus more on the desirability aspects of an option, which means the benefits an option promises. Meanwhile, PDMs are more occupied with feasibility aspects, for example, price in consumption scenarios, and pay more attention to such factors when deriving their decision. Lu et al. (2013) have shown how this difference in focus is caused by differences in construing presented information, which in turn is caused by psychological distance. Following this argumentation, we expect:

H8: ADMs and PDMs focus on different information when deriving their decision.

The hypotheses derived above shall be tested using empirical data collected through two studies. Table1 below provides an overview of how the hypotheses derived from theory connect to the research questions, and how they shall be tested empirically.

Table1: An Overview of the Research Questions, Hypotheses, and Data Sources

Research Question (RQ)	Hypotheses	Data source
(1) To what extent does the number of options impact the satisfaction of decision-makers deciding for themselves or others in line with the choice overload hypothesis?	H1 ADM-highs' decision-making should be similar to that of PDMs.	<i>Study1.</i> Data analysis: Accountability's impact on the psychological distance of ADM-highs.
	H2a PDMs' and ADM-highs' choice satisfaction will first increase, then decrease as choice-sets become increasingly large.	<i>Study1 and Study2.</i> Survey questions:

	H2b ADMs' satisfaction will increase with choice-set size.	I am satisfied with my decision...
(2) To what extent does self-/other decision-making impact reactions of being exposed to choice overload beyond satisfaction?	H3a PDMs and ADM-highs experience more difficulties when making decisions from increasingly large choice-sets.	<i>Study1 and Study2.</i> Survey questions: I think the decision was difficult...
	H3b Experienced decision-making difficulty does not increase for ADMs as choice-set size increases.	
	H4a Choice confidence of PDMs and ADM-highs will decrease as the choice-set size increases.	<i>Study1 and Study2.</i> Survey questions: I am confident that my chosen option is the best alternative that was available...
	H4b Choice confidence of ADMs will decrease less than for PDMs and ADM-highs as the choice-set size increases.	
	H5a The willingness to revise a choice will increase as the choice-set size increases for PDMs and ADM-highs.	<i>Study1 and Study2.</i> Survey questions: If provided with more time I would revise my decision...
	H5b The willingness to revise a choice as the choice-set size increases will increase less for ADMs than for PDMs and ADM-highs.	
	H6 ADMs' decision enjoyment will decrease less when choice-set size increases than PDMs'.	<i>Study1 and Study2.</i> Survey questions: I enjoyed making the decision...
(3) To what extent does self-/other decision-making impact the amount and type of information decision-makers consider before choosing?	H7 PDMs look through a larger percentage of their available options than ADMs.	<i>Study2.</i> Data analysis: The percentage of available options considered before choosing.
	H8 ADMs and PDMs focus on different information when deriving their decision.	<i>Study2.</i> Data analysis: The reported percentage given to different attributes.

3. Methodology

In this section, our scientific approach to answering the research questions will be presented, followed by a description of the two studies we conducted to answer these questions. Subsequently, we will introduce the multivariate multiple regression model (MMR) that was applied to analyze the results of these studies.

3.1. Scientific Approach

In terms of epistemology, we follow a positivist approach, trying to explain certain aspects of decision-making. Objective insights are to be created employing methods from natural sciences, using randomized experiments with the goal of finding causal relationships between dependent variables (DVs) and independent variables (IVs) (Bryman & Bell, 2011). In the theory section we have derived hypotheses which we expect to hold based on overchoice theory and CLT. Therefore, a deductive approach is employed, as the developed hypotheses are rooted in existing literature and theory, and will be tested using empirical data (Bryman & Bell, 2011). A non-exhaustive overview of prior research studied for that purpose can be found in Appendix-A. Given that most research on overchoice has been conducted quantitatively, it was a natural decision to conduct our research in the same manner. Adopting the same approach allows us to build on prior findings of researchers in the field, to critically assess, and to extend them. This is done by scrutinizing aspects of choice overload that, as lined out in the purpose section, present gaps. Only when applying a comparable methodology can our results be compared to the findings of, e.g., Polman (2012a), and complement them by investigating the identified problem areas. Nevertheless, we acknowledge that a qualitative study, focusing on the decision-making process and how individuals subject to overchoice perceive and experience the phenomenon, would also have been valuable to extend the existing literature. However, we decided against this approach, primarily due to the implications of Covid-19 on the feasibility of employing qualitative methods such as think-aloud studies, which would have otherwise been a promising approach to explore the underlying process of overchoice.

To account for the complexity of decision-making and to focus on different aspects of the overchoice phenomenon, the decision was made to conduct two studies. Study1 sets out to shed light on how the overchoice hypothesis is impacted by having decision-makers choosing for someone else. In this study, the overchoice phenomenon will be explored in several of its dimensions such as satisfaction, confidence, enjoyment, or perceived difficulty. Meanwhile, Study2 emphasizes the process that decision-makers go through when deciding for themselves or others, investigating how much, and which information participants look at before choosing from differently sized choice-sets. Hence, the aim of Study2 is to investigate aspects of the underlying process of overchoice in a quantitative

fashion. Looking into this process is something which has so far not been done extensively, as previous studies have largely treated the process as a “black-box”. The different aims of the two studies and the hypotheses they relate to are shown in Table1. While Study2 allows us to dive deeper into specific aspects of overchoice, promising new insights into how decision-makers act in the context of overchoice, there are also additional advantages of having two studies. For example, it allows us to apply a different method of recruiting participants, resulting in a larger and more diverse pool of participants. This allows to mitigate potential disadvantages and biases stemming from the convenience sampling (Bryman & Bell, 2011) employed in Study1, which is essential in the ongoing replication crisis in the social sciences (Dreber & Johannesson, 2019; Open Science Collaboration, 2015).

While prominent studies such as Iyengar and Lepper (2000) or Lenton et al. (2008) have gathered data in person, the context of Covid-19 constrained us to collecting data entirely online. Therefore, both studies were launched on Qualtrics.

3.2. Pilot Study

Preceding large-scale data collection, a pilot was conducted to identify potential errors in the set-up of the studies, to adjust potentially misleading instructions, and to get a sense of what scope is realistic for actual data collection. Thus, the pilot study was largely identical to the two actual studies and had the goal of ensuring data quality. The pilot was distributed to fourteen undergraduate students, as well as our close relatives, and their feedback was incorporated in the final versions of the studies. These adjustments included more explicit instructions on how to navigate through the studies as well as several cases of shortened and more precise wording to prevent misunderstandings and to minimize the tiredness of participants (Söderlund, 2005).

3.3. Study1

To ensure comparability with prior overchoice studies, we decided to launch a study in which participants were randomly assigned into different choice-set sizes. Facing these choice-sets, participants were then asked to make choices. A non-exhaustive overview of the methodology of prior studies concerning overchoice, that we based our decision regarding study design on, can be found in Appendix-A. The key DVs examined in Study1 were choice satisfaction, perceived difficulty, confidence, willingness to revise, and enjoyment, as seen in Table6. Aim of this first study was thus to examine the effect on these DVs when the IVs were manipulated. The IVs were choice-set size, being assigned the role of PDM or ADM, and high or low accountability. Participants were randomly assigned into treatments with different conditions of these IVs.

Participants

Participants for Study1 were recruited using convenience sampling, leveraging personal networks and platforms such as Facebook, or LinkedIn. Recruiting an arguably more diverse participant pool using e.g. MTurk or Prolific was out of budget for Study1, given the required large number of participants and average response time of the pilot study. However, a representative study for the context of overchoice is ambiguous and ambitious regardless of budget, since overchoice is proposed to be a universal phenomenon supposedly occurring in all kinds of decision-making scenarios. While students are overrepresented in our networks and therefore also among our participants, our participant pool is still more diverse than many previous studies on overchoice, such as Park and Jang (2013) or Lenton et al. (2008), whose participants were exclusively students. Moreover, there is still considerable diversity among our participants, who represented 33 different countries and were aged between 19 and 83. Median age of participants was 25, more information about the demographic composition of participants can be found in Table2 below. Further, a full list of participants' nationalities can be found in TableB1 Appendix-B.

Table2: Composition of Participants Study1 (n=166)

	Baseline characteristic	<i>n</i>	%
Gender	Female	87	52.4%
	Male	75	45.2%
	Other / Prefer not to say	4	2.4%
Age	18-19	2	1.2%
	20-29	138	83.2%
	30-39	9	5.4%
	40-49	4	2.4%
	50-59	7	4.2%
	60+	6	3.6%
Nationality*	German	52	31.3%
	Swedish	40	24.1%
	Other European	46	27.7%
	Other Non-European	28	16.9%

*For a full list of nationalities, see TableB1 Appendix-B.

Data was collected from 17/03/2021 to 26/03/2021. While 273 individuals participated, only 166 responses were kept for further analysis, as some had to be excluded⁴. It should

⁴ Out of 273 participants, 211 finished the study, meaning that 62 responses were excluded from the study for being incomplete. Out of those completing the questionnaire, 8 refused to answer one or more questions – that were not demography questions. Further, 37 participants failed one or more attention

be noted that the number of analyzable observations is below the original goal of 200 or more participants – derived in accordance with the participant calculation for multivariate multiple regression that can be found further down. However, the number of participants is still higher than the minimum number of 100 participants relevant for our study (Dattalo, 2013).

Procedure

As visualized in Figure3, participants of Study1 went through three rounds of decision-making, picking a hotel, a bottle of wine, and a charity they wanted us to donate to as a sign of gratitude for them completing the study⁵. Every decision-making round was accompanied by a set of follow-up questions. Each round, participants were randomized into different treatment groups, as will be elaborated below.

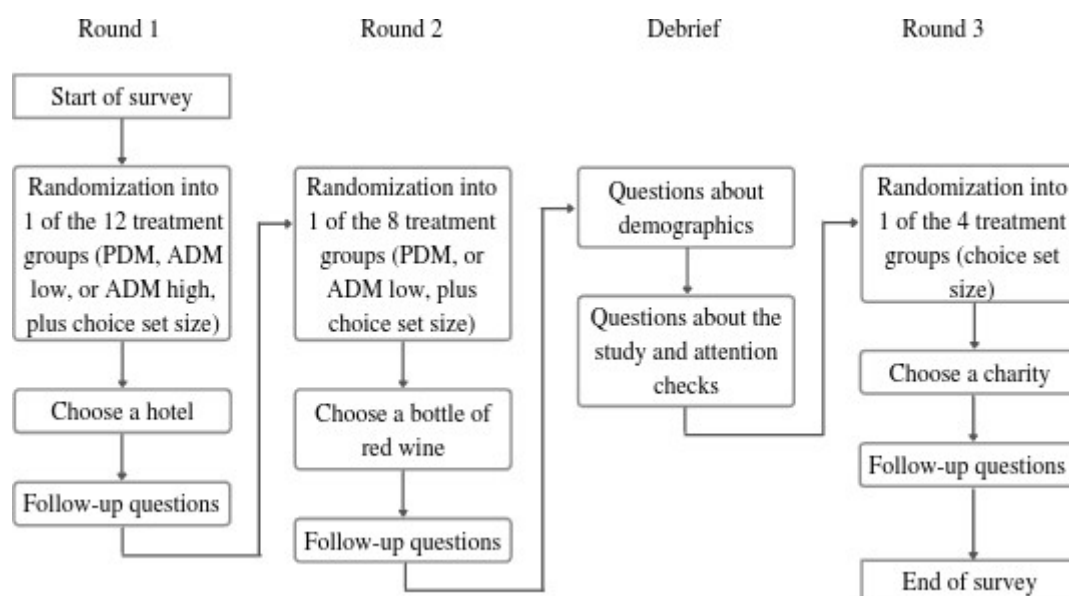


Figure3: Flow Chart of Study1

Unlike most studies on overchoice, our Study1, consisting of three rounds, required participants to make multiple decisions instead of the usual one-shot decisions. For each round, participants were randomly assigned to choosing from a choice-set consisting of

checks and were therefore excluded from further analysis. The total number of participants whose answers we could use for subsequent analyses was therefore reduced to 166.

⁵ The reason for using hotels was that, while choosing hotels is a consumption decision, it is not a classic low-impact decision-making scenario. This makes it more likely to evoke choice overload (Schwartz, 2016). Wine was chosen as second decision-making scenario as it is considered a decision that is realistically made for others, but for which one might expect decision-makers to still put in a certain degree of effort. Lastly, charities were used in the third round, because we wanted a decision with real consequences, which participants do not necessarily recognize as part of the study. This will be explained in the section describing round3.

either five, ten, 25, or 50 alternatives. In the follow-up question blocks, participants were asked to report their satisfaction, perceived difficulty, confidence, the likelihood that they would want to revise their choice, and enjoyment on 7-point Likert-type scales. Some of these question blocks, which are Blocks 2, 4, and 7 in Table3 below, additionally included questions on expertise and attention checks. A total of four instructed response attention checks were used in Study1; one in round1, one in round2, and two in the debriefing, to protect scale validity (Kung et al., 2018). The structure of the study can be found in Table3 below, and a whole print-out version of the study in Appendix-C. In the following sections, the three rounds will be described.

Table3: Study Structure, Study1

Round 1	Block 1	Choice of a hotel in Johannesburg.	Question 1
	Block 2	7 follow-up questions regarding the decision, 1 question each on expertise, control question, and attention check.	Questions 2-11
Round 2	Block 3	Choice of a bottle of red wine.	Question 12
	Block 4	7 follow-up questions regarding the decision, and 1 question on expertise, control question, and attention check.	Questions 13-22
Debrief	Block 5	Demographics (age, gender nationality), 3 ratings of the ease of understanding the study, and 2 attention checks.	Questions 23-30
Round 3	Block 6	Choice of a charity.	Question 31
	Block 7	4 follow-up questions regarding the decision.	Questions 32-35

Round1 – Choosing a Hotel

The first decision-making scenario asked participants to choose an accommodation for a weeklong trip. Johannesburg was chosen as destination, since it is relatively uncommon for the primarily European participants. This was done to minimize the risk of pre-defined preferences, whose absence has been found to be a necessary precondition for overchoice (Scheibehenne et al., 2010). Furthermore, this destination also allowed us to avoid recognition bias, that is participants deciding for specific options simply because they are familiar (Gigerenzer & Goldstein, 1996). Recognition and pre-defined preferences were further prevented by anonymizing hotels' names and removing logos from pictures. Participants, therefore, can be assumed to have made their decision based on the information the study provided. That is; the hotels' stars, customer rating, location, price, two pictures, and a list of amenities. The exact content and presentation of Study1 can be seen in Appendix-C. As the information presented to participants was taken from actual hotels in Johannesburg, it can be deemed realistic and representative.

Using representative information from a genuine market to create choice-sets should ensure that there are no dominant options, as hotels in this market can be expected to compete with each other. Therefore, this decision-making scenario also fulfills the second important precondition for overchoice as identified by Scheibehenne et al. (2010). Additionally, representative hotel information ensured that the options participants could choose from mirror the decisions faced by actual visitors. Therefore, the hotels presented on the first three pages of Booking.com⁶ were used for the choice-sets, providing us with a pool of 75 hotels. While the potential choice-set faced by real travelers is still considerably larger, empirically only 5% of decision-makers venture beyond the first page of online search results, and only about 1% go as far as page three (Chitika Insights, 2013). Hence, taking the results from the first three search result pages was deemed appropriate, as the actual, not potential, choice-set faced by decision-makers is rarely larger.

On top of the randomized choice-set size, participants were randomly assigned into being ADMs or PDMs. Further, ADMs were randomly assigned to either high- or low-accountability⁷. Therefore, participants were assigned into 4x2x2 different treatments as visualized in Figure 4 below. Participants were then asked to choose from their choice-set, with the corresponding number of hotel options randomly drawn from the pool of 75 hotels.

50 was chosen as the largest choice-set size, as it realistically corresponds to the choice-set that many travelers face and is in the range of choice-set size in which overchoice has been found for hotels (Park & Jang, 2013). Meanwhile, five was chosen as the smallest choice-set, as it is very likely smaller than the choice-set size for which effects of overchoice are expected to become relevant for hotels (Park & Jang, 2013). Having two additional intermediate choice-set sizes differs from e.g. Polman (2012a) who was limited to one small and one large choice-set. Thus, to find out more about certain characteristics of choice overload, such as the proposed inverted U-shape that describes satisfaction, this study uses four different choice-set sizes.

After making their decision, participants were asked to report how they perceived the decision-making scenario on 7-point Likert-type scales as explained previously.

⁶ Prices, availability, and amenities correspond to Booking.com results for a 7-day trip to Johannesburg South Africa, as described in the scenario handed out to participants. The 75 hotels chosen for this study correspond to the first 75 listed by Booking.com, without applying any filters.

⁷ Using anonymity to induce low or high accountability towards the person affected by the decision has been used successfully by Beattie et al. (1994). Consequently, accountability in our study has been manipulated in the same manner. Participants assigned as ADMs were informed that they would choose the hotel for a friend. Those assigned to the low accountability treatment then got the instruction that the friend would not know that it was them specifically who chose the hotel. Meanwhile, those assigned to the high accountability treatment (ADM-highs) were instructed that the friend would know that they were the one who chose the hotel, making them directly accountable vis-à-vis the friend they are making the decision for.

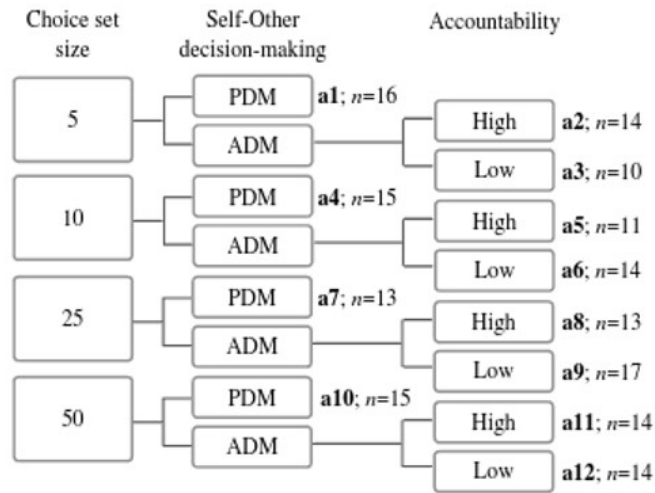


Figure4: Visualization of the twelve treatment groups (a1 to a12) for Study1 round1 (n=166)

Round 2 – Choosing a Bottle of Red Wine

Subsequently, participants entered the second round of decision-making, this time choosing a bottle of red wine. Participants were again randomized into treatment groups in which they were either ADMs or PDMs, randomly facing choice-sets of five, ten, 25, or 50 options. Accountability was not manipulated in this round, therefore, participants were assigned into 4x2 different treatments as visualized in Figure5. PDMs were instructed to pick a bottle of wine for themselves, whereas ADMs were asked to choose one to gift a friend.

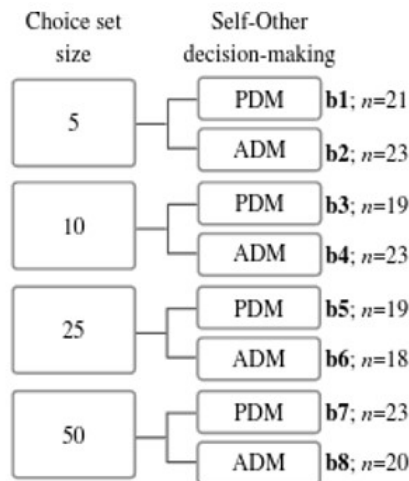


Figure5: Visualization of the eight treatment groups (b1 to b8) for Study1 round2 (n=166)

The different options comprising the choice-sets were randomly drawn from a pool of 120 red wines taken from Systembolaget.se. As Systembolaget monitors the nationwide Swedish monopoly for selling alcohol, the options taken from their website can be

deemed representative of what customers, at least in Sweden, face when buying wine. To make the experience as realistic as possible, participants were displayed the same information and in the same manner as done on Systembolaget.se. The information participants faced included a picture of the bottle, name, and price, as well as ratings of the wine's fullness, roughness, and acidity. Further the production year, country, which food the wine fits well with, and a short description of the wine's taste were provided. After their decision, participants were again asked follow-up questions using 7-point Likert scales. Additionally, since subject-specific expertise has been shown to mitigate the negative effects of large choice-sets (Chernev et al., 2015), a question to evaluate participants' expertise on wine was included. Participants were asked which out of six named grapes were used to produce red wine in line with measuring objective knowledge presented by D'Alessandro and Pecotich (2013)⁸. A complete version of the questions asked, and the information provided to participants can be found under Appendix-C.

It should be noted that in different countries, Sweden among those, alcohol has an ethical connotation (IQ-initiativet AB, 2019). However, our study focuses on decision-making, not people's personal connection to alcohol or alcohol consumption. Nevertheless, having participants make choices involving alcohol could be considered unethical as for instance someone underaged or individuals with a current or former addiction could participate. Therefore, participants were asked upon recruitment, whether they are aged 18 or above⁹, corresponding to the legal drinking age in most parts of the European Union (European Union Agency for Fundamental Rights, n.d.). Additionally, focus of the study was not on alcohol per se, but rather on aspects of decision-making and outcomes such as satisfaction, difficulty, or confidence.

Round 3 – Debriefing & Charities

Following the first two rounds, participants were debriefed and asked to provide demographic information. Subsequently, the last round of decision-making was initiated. This time, participants were asked to choose a charity they want us to donate to, as a sign of gratitude for their study completion. This third round of decision-making came after the debriefing to simulate a clear cut, emphasizing that whereas the first two decision-making rounds were hypothetical situations, this round is a decision with real-world consequences. CLT suggests that making hypothetical decisions can induce psychological distance (Trope & Liberman, 2003). Therefore, emphasizing towards participants that this round of decision-making is not hypothetical was deemed important to create a valid comparison between hypothetical and actual decisions.

⁸ For each correct answer participants received 1 expertise point, for each incorrect answer 2 expertise points were deducted. Participants with an expertise score of 3 or higher were considered to have a high expertise in wine.

⁹ In hindsight, participants should also have been asked whether they consume alcohol or not.

As can be seen in Figure6, participants were randomized into four treatments to choose from either five, ten, 25, or 50 different charities, which were drawn randomly from a pool of 50 charities. Again, 50 was considered as a choice-set large enough to theoretically cause overchoice, following Scheibehenne et al. (2009) in a comparable setting. Similarly, no prior studies that we are aware of detected overchoice for five or fewer options, indicating that the proposed turning point should lie somewhere between our largest and smallest choice-set. Participants were presented with real charities, their logos, as well as short descriptions about their activities, and were then requested to decide. Afterwards, participants were again asked to indicate their confidence, satisfaction level, and perceived difficulty on a 7-point scale. This last block of follow-up questions was limited to four questions. A complete printout of one of the treatments of Study1, its three rounds, and follow-up questions can be found in Appendix-C.

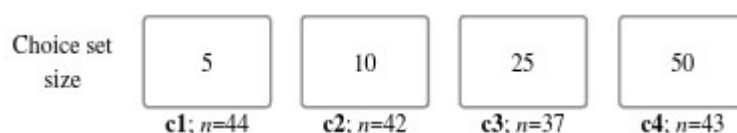


Figure6: Visualization of the four treatment groups (c1 to c4) for Study1 round3 (n=166)

3.4. Study2

Purpose of Study2 was to investigate the underlying process of overchoice. That is, how do PDMs and ADMs differ in terms of the quantity of information they look at, as well as the type of information they use to derive their decision. Hence, these IVs were added to the set of variables examined in Study1. While the general setting was the same as in the first round of Study1, booking a hotel in Johannesburg, some aspects of the experimental design were adjusted. As in previous process-tracking studies (e.g. see Andersson, 2004), participants had to proactively select which information they want to receive before deciding. Thus, while decision-makers in Study1 immediately received information regarding all options in their choice-set, participants of Study2 had to consciously decide on options they wanted more information about from a menu. This allowed us to track how many options were considered before participants decided. Participants were further asked to indicate which factors influenced their choice and to what extent, to give an indication of what went on in the “black-box” of participants' minds. Once again, participants were randomly assigned to different treatments, this time four in total, as visualized in Figure7.

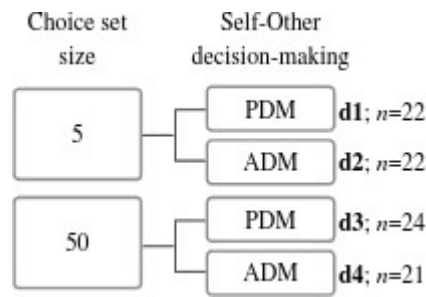


Figure7: Visualization of the four treatment groups (d1 to d4) Study2 (n=89)

Participants

In contrast to Study1, participants were recruited using Prolific, an online participant recruitment service. 93 people completed the study, out of which 4 were excluded for failing one or more of the three attention checks, which were designed equivalent to those in Study1. Data was collected between 19/03/2021 and 22/03/2021. Demographic information about participants can be found in Table4 below, the median age of participants was 24.5 years and participants represented 30 different countries.

Table4: Composition of Participants, Study2 (n=89)

	Baseline characteristic	<i>n</i>	%
Gender	Female	42	47.2%
	Male	47	52.8%
Age	18-19	10	11.2%
	20-29	53	59.6%
	30-39	10	11.2%
	40-49	6	6.7%
	50-59	7	7.9%
	60-69	2	2.3%
	Chose not to answer	1	1.1%
Nationality*	British	17	19.1%
	Polish	15	16.9%
	Other European	29	32.6%
	Other non-European	27	30.3%
	Chose not to answer	1	1.1%

*For a full list of nationalities, see TableB2 Appendix-B.

Procedure

As mentioned above, the main difference to the first round of Study1 was how Block1, as visualized in Table5, was designed to track the process of decision-making. Instead of

providing participants with all available information, options were presented in a menu from which participants had to manually select options they want to learn more about, one at a time. Additionally, Block2 was added to inquire which information, and to what degree, was used to make the decision.

Table5: Study Structure, Study2

Block 1	A monitored choice of hotel; how many choices were considered (quantity of information requested).	Question 1
Block 2	100-point question on what information swayed the decision.	Question 2
Block 3	6 follow-up questions regarding the decision, 1 question each on experience, expertise, attention check and a control question.	Question 3-12
Debrief	Demographics (age, gender nationality), 3 ratings of the ease of understanding the study, and 2 attention checks.	Question 13-20

As can be seen in Figure7, like in Study1, participants were randomized into different treatment groups, this time 2x2 different ones. Treatments differed along two dimensions, choice-set size being small (five) or large (50), as well as decision-making being either for the decision-maker herself (PDM) or for someone else (ADM). The options that decision-makers faced were randomly chosen from the pool of 75 Johannesburg hotels created for Study1. Apart from the additional question asking which information and to what extend decision-makers considered, the remainder of the study was parallel to Study1. This was done to ensure comparability. While this structure is visualized in Table5 above and Figure8 below, a complete printout of Study2 can be found in Appendix-D.

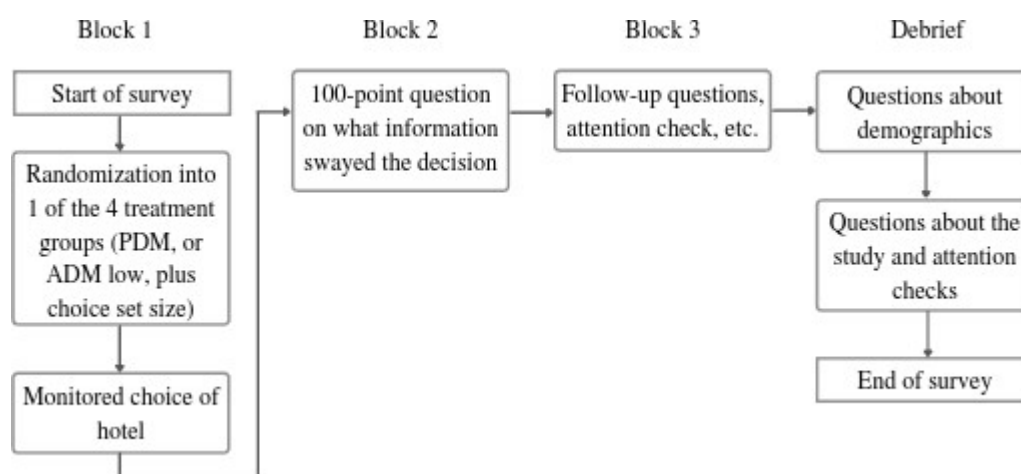


Figure8: Flow Chart, Study2

3.5. Multivariate Multiple Regression Model

For analyzing our results, a multivariate multiple regression (MMR), as well as ANOVAs, were used. The decision to use MMR was made as the model uses more than one DV and more than one IV (Dattalo, 2013). This is a strength of MMR, which is an extension of OLS regression allowing for these special circumstances. The “MMR estimates the same regression coefficients and standard errors that would be obtained by using separate OLS regression equations for each DV” (Dattalo, 2013, p. 87). Hence, MMR was identified as the best match for the data collected in our two studies. Additionally, both MANOVA and multiple ANOVA analyses were conducted. The MANOVA was used to control for collinearity. Meanwhile, the ANOVAs, due to their more easily understood nature were used for a preliminary analysis presented in Table8.

Table6: Overview of the study variables

	Dependent Variables	Independent Variables
Study1	Choice satisfaction	Choice-set size (4 groups)
	Choice difficulty	PDM or ADM
	Choice confidence	Accountability (low/high)
	Choice revision	
	Choice enjoyment	
Study2	Choice satisfaction	Choice-set size (2 groups)
	Choice difficulty	PDM or ADM
	Choice confidence	
	Choice revision	
	Choice enjoyment	
	Percentage of options considered	
	Information considered	

Following Dattalo (2013), there is limited discussion regarding the appropriate sample size for conducting MMRs. However, there are techniques to calculate required size by using the power, number of treatment groups, and DVs. Such conventional power calculations become difficult, since the number of treatment groups changes between the rounds of Study1 together with the effect size. Therefore, a simpler technique to reach reliable results has been used, applying the shortcut to have at least 20-40 participants per DV (Dattalo, 2013). Therefore, our aim for Study1 was 40 participants per group * 5 DVs = 200 participants in total. It should be noted that despite aiming to reach over 200 participants, a minimum of 100 participants would be acceptable though not preferred. Thus, the 166 participants of Study1 were below our targeted number but still within acceptable range. Because of the changed structure of Study2 we were able to properly

conduct the calculation in line with Pituch and Stevens (2015) and Lauter (1978). Reaching the result that a minimum of 68 participants are needed for Study2¹⁰.

Estimating the equations, it should be noted that the response variables (DV) follow their own regression models, in line with Dattalo (2013). Furthermore, it should be noted that the IV ADM or PDM (Distance), as well as Accountability, are binary. Moreover, it is relevant to keep in mind that accountability is only applicable for ADMs and has neither been tested nor manipulated for PDMs.

$$\text{Satisfaction}_i = \beta_0 + \beta_1 * (\text{Size})_i + \beta_2 * (\text{Distance})_i + \beta_3 * (\text{Accountability})_i + \varepsilon_i \quad (1)$$

Where Satisfaction is the self-reported level of satisfaction of individual i , β_0 is a constant, and ε_i is the error term.

$$\text{Difficulty}_i = \beta_0 + \beta_1 * (\text{Size})_i + \beta_2 * (\text{Distance})_i + \beta_3 * (\text{Accountability})_i + \varepsilon_i \quad (2)$$

$$\text{Confidence}_i = \beta_0 + \beta_1 * (\text{Size})_i + \beta_2 * (\text{Distance})_i + \beta_3 * (\text{Accountability})_i + \varepsilon_i \quad (3)$$

$$\text{Revision}_i = \beta_0 + \beta_1 * (\text{Size})_i + \beta_2 * (\text{Distance})_i + \beta_3 * (\text{Accountability})_i + \varepsilon_i \quad (4)$$

$$\text{Enjoyment}_i = \beta_0 + \beta_1 * (\text{Size})_i + \beta_2 * (\text{Distance})_i + \beta_3 * (\text{Accountability})_i + \varepsilon_i \quad (5)$$

For equation (2) through (5); Difficulty is the self-reported level of difficulty with the decision made. Confidence is the self-reported level of confidence with the decision made. Revision is the self-reported willingness to revise the decision made. Enjoyment is the self-reported level of enjoyment making the decision.

3.6. Reliability and Validity

Reliability and validity need to be considered to strengthen the trustworthiness of data (Bryman & Bell, 2011). Reliability addresses the consistency of the measure used, meaning a measure is considered reliable if a replication would lead to consistent results

¹⁰ This number was reached based on the values: Power=0.7, effect size=very high, DV=5, and groups=4. Note that despite having 7 DVs in Study2, no more than 5 will be used in the same multivariate multiple regression, which lay the foundation for this calculation.

(Bryman & Bell, 2011). Validity focuses on whether the applied method actually measures what is intended (Borsboom et al., 2004). These concepts in relation to our thesis will be discussed below.

As mentioned, a pilot study was conducted as part of the process of creating our studies. Afterwards, discussions were held with the pilot study participants to evaluate our studies and establish potential areas of improvement. These discussions included participants' opinions, thoughts, and understanding of the questions. During this process we improved our studies to ensure that the questions were as easy to understand as possible, to warrant the study tested what was intended, increasing the construct validity and the face validity (Holden, 2010; Reis & Judd, 2000).

The DVs on which participants were asked to report after each round of decision-making, were measured on 7-point Likert-type scales, as mentioned earlier. Anchor labels were provided to avoid confusion and to ensure that participants could select the option that corresponded to their opinion. Using seven different scale points, and minimizing the risk of misinterpretation of scale points by labelling each point, has been shown to generate increased test-retest reliability (Weng, 2004). Appendices C and D show how the scale points were named for different variables. Cronbach's alpha was not used as a measure of internal consistency, as our DVs describe fundamentally different theoretical constructs and concepts¹¹.

For Study1 convenience sampling was used, which is not ideal in terms of validity as the sampling method is an important aspect of validity. To increase the validity of the study, additional test questions were included in the study design. These included, as mentioned before, multiple attention checks in both Study1 and Study2, meant to protect scale validity (Kung et al., 2018).

Additionally, attempts were made to make the two studies as close to reality as possible. The aspect of whether something observed in a study, or a laboratory experiment could be observed in the real world is referred to as ecological validity. This includes the setting, the stimuli, and the response (Schmuckler, 2001). Throughout the studies, efforts were made to make everything look and seem as realistic as possible. For instance, information from real hotels was taken and then fully anonymized to mirror a competitive market without the risk of recognition bias and pre-existing preferences. The wines in round2 were real brands, information, and prices, taken from Systembolaget.se. Moreover, the charity choice was a genuine decision with real consequences. Worth noting is that in Study2 participants had to click on each option to receive information about the hotel, which is not in line with most webpages, and therefore differs from the norm meaning the

¹¹ While some DVs can be expected to correlate, for example satisfaction and confidence, these items nevertheless reflect different concepts, different theoretical constructs, even if measured on the same scale. Therefore, the decision was made not to use Cronbach's alpha. For the sake of completeness, alpha values for the three rounds of Study1 and the one round of Study2 ranged between 0.84 and 0.77, which is generally deemed acceptable (Lance et al., 2006).

used experimental design holds less validity in terms of setting, and potentially also stimuli, and response than does Study1.

3.7. Quality Control

In order not to approach analysis and subsequent interpretation of our data too naïvely, our studies included some quality measures. Before elaborating on the main part of our analyses, we will now report on these quality aspects.

Quality controls included the debriefing questions as described in the study structures Table3 and Table5. Both studies included debriefing questions asking participants if questions and answers were formulated clearly, and whether they believed any aspect of the study tried to persuade them in any direction. Most participants somewhat to strongly agreed with the questions being clear, meaning 96.4% agreed in Study1 and 97.8% in Study2. The same applied for whether the available answers were clear, which 96.4% in Study1 and 97.8% in Study2 somewhat to strongly agreed with. Further, 89.2% of participants in Study1 and 91% in Study2 indicated that they had not been persuaded to answer in a specific way. This indicates that our study design was considered clear and neutral by most participants, therefore, these aspects should not negatively impact the quality of collected data.

We further checked whether participants recognized the choice options that were available for them. In Study1, 76.5% of participants responded that they did not recognize any of the available options in round1. In Study2, 78.41% of participants indicated that they did not recognize any of the options. Recognizing one or more of the choice options had no significant effect on the DVs, as seen in TableE1 in Appendix-E.

Further, we checked whether participants actually took note of the number of options they faced. Asking participants whether the number of options was too low, too high, or reasonable, throughout Study1 and Study2 participants randomized into the large choice-sets of 25 and 50 answered statistically significantly different than those in choice-set size five. This was true independent of round, study, psychological distance, and accountability ($p < 0.05$), see TablesE2-E5 in Appendix-E. This clearly shows that the participants were aware of and paid attention to the number of options they faced. This is an important element of the study as it shows that our manipulation of choice-set size worked. If participants had not noticed that they were facing more options, then we could not have expected the quantity of choices to have any effect on them.

Table7: Summary of descriptive statistics and correlation for DVs H1-H6, Study1 and Study2

	Variable	<i>n</i>	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Study1 round1 (hotel)	1. Satisfaction	166	5.22	1.26	-			
	2. Difficulty	166	4.50	1.78	-0.56	-		
	3. Confidence	166	4.75	1.64	0.66	-0.51	-	
	4. Revision	165	4.22	1.86	0.52	0.55	-0.5	-
	5. Enjoyment	166	4.30	1.60	0.59	-0.41	0.65	-0.46
Study1 round2 (red wine)	1. Satisfaction	165	5.18	1.29	-			
	2. Difficulty	164	4.02	1.90	-0.49	-		
	3. Confidence	166	4.49	1.88	0.69	-0.59	-	
	4. Revision	165	3.75	1.80	-0.47	0.40	-0.37	-
	5. Enjoyment	165	4.30	1.76	0.57	-0.49	0.60	-0.32
Study1 round3 (charity)	1. Satisfaction	166	5.49	1.25	-			
	2. Difficulty	165	4.26	1.94	-0.54	-		
	3. Confidence	165	5.06	1.79	0.70	-0.59	-	
Study2 (hotel)	1. Satisfaction	89	5.56	1.19	-			
	2. Difficulty	89	4.03	1.51	-0.29	-		
	3. Confidence	89	5.24	1.41	0.71	-0.21	-	
	4. Revision	89	3.69	1.57	-0.38	0.41	-0.3	-
	5. Enjoyment	89	4.85	1.48	0.67	0.55	-0.34	-0.24

Further, variable correlation was controlled, as shown in Table7. Correlation between Satisfaction and Confidence was one of the strongest throughout the studies (round1=0.66; round2=0.69; round3=0.70; Study2=0.71). This was not surprising considering Chernev et al. (2015) used the two interchangeably in their meta-study. However, there is no collinearity between the two variables or any other of the variables in Study1 nor Study2 as was tested through the MANOVA. Correlations for the data used for H7 and H8 were low, as presented in TableF1 and TableF2 in Appendix-F.

An additional control was conducted based on gender, age, and nationality. None of these gave significant results impacting any of the DVs in either of the studies. Therefore, it can be concluded that none of these has had an impact on the results.

Additionally, we controlled in both studies, whether there was any difference on the DVs based on the time spent making decisions. In Study1 round2 there was no significant impact of the time spent on any of the DVs (TableE11 Appendix-E). Generally, also in Study1 round1 and round3 there was no significant impact of the time spent. Nevertheless, in these rounds a very small number of instances showed a significant impact of time spent as can be seen in TableE10 and TableE12 Appendix-E. However, no clear pattern was identified, hence these impacts were most likely random. Further

investigating the impact of time spent deciding was considered out of scope. In Study2 there was no significant impact of the amount of time spent on any of the DVs, as can be seen in TableE13 Appendix-E. It could be discussed whether the differing nature of the decision-making scenarios, choosing a hotel, wine or a charity might impact the decision-maker and how she approaches the choice. While different approaches cannot be ruled out, the time participants spent in the individual decision-making rounds of Study1 does not indicate such differing approaches.

Moreover, in terms of expertise in wine, 48.8% of participants got high enough scores to be considered to have expertise. This high value could either indicate that the respondents of the survey had a generally high level of expertise, that they chose to look up the correct answers, or that the question was too simple to properly judge expertise. When running the MMR controlling for wine expertise, there was no significant difference on any of the DVs between those with high expertise and low expertise. There was no statistically significant difference between PDMs or ADMs of high and low expertise, which can be seen in TableE6 in Appendix-E. This could indicate that unlike claimed by Chernev et al. (2015), expertise does not moderate overchoice effect. It could also be an indication that as discussed previously, the expertise question was too simple.

4. Results and Analysis

In the following paragraphs, we present and analyze the results of our studies. The hypotheses we developed will be tested using the collected empirical data, and interpretations will be made accordingly. This section of the thesis will then conclude by providing an overview of which of our hypotheses were supported or not in Table 13.

4.1. Analytical Procedure

The collected data was exported from Qualtrics to Stata SE 16.1 in CSV format. Subsequently, the data was cleaned, that is, all observations which had to be excluded for reasons stated previously were dropped. Whereas H1 to H7 were tested using the MMR model explained above, H8 was tested using independent t-tests. Additionally, a preliminary analysis of ANOVAs was conducted.

At this point, it should be noted that, especially in the context of the replication crisis (Dreber & Johannesson, 2019; Open Science Collaboration, 2015), data should not be analyzed and interpreted naïvely. Further, it is also important to report all results, including those non-significant (Dreber & Johannesson, 2019). Being aware of the limitations of our study, we will present all the results with an aware mindset.

ANOVA

A preliminary analysis of the results was conducted with multiple ANOVAs. It should be noted that Table 8 is based on separate one-way ANOVA for each DV in each round of the studies.

As can be seen in Table 8 throughout Study 1 there were significant results among the different treatment groups for each DV. This shows that at least one of the treatment groups for each DV is significantly different from the others. As explained in the methodology section, the groups are subject to different psychological distances (PDM, ADM, ADM-high) and choice-set sizes (five, ten, 25, 50). The results of the ANOVAs indicate that in Study 1 these groups act differently, showing that manipulation of the IVs had an effect. This in turn indicates that there exist differences among the treatment groups, which will be explored further by testing the hypotheses.

Notably, in Study 2, in contrast to Study 1, none of the DVs showed a significantly different result based on the groups, despite their differing psychological distance (PDM, ADM) and choice-set sizes (five, 50), as seen in Table 8. This will likely impact the regressions run when evaluating bespoke hypotheses.

The difference in variance between Study 1 and Study 2 could potentially be due to the different study designs, recruitment of participants, or cultural differences. This will be discussed further under section 4.4 of this thesis.

Table8: Analysis of variance

	DV	SS	df	MS	F	η^2
Study 1	Satisfaction	260.19	165	1.58	2.87**	0.17
Round 1	Confidence	444.87	165	2.70	3.02**	0.18
(hotel)	Difficulty	523.5	165	3.17	3.31***	0.19
	Enjoyment	420.94	165	2.55	2.19*	0.14
	Revision	564.15	164	3.44	2.72**	0.16
Study 1	Satisfaction	271.90	164	1.66	2.51*	0.10
Round 2	Confidence	583.48	165	3.54	3.46**	0.13
(red wine)	Difficulty	590.95	164	3.60	3.46**	0.13
	Enjoyment	506.45	164	3.09	6.64***	0.23
	Revision	533.31	164	3.25	3.53**	0.14
Study 1	Satisfaction	257.49	165	1.56	8.14***	0.13
Round 3	Confidence	523.39	164	3.19	6.70***	0.11
(charity)	Difficulty	619.31	164	3.78	16.6***	0.24
Study 2	Satisfaction	123.91	88	1.41	0.35	0.27
(hotel)	Confidence	174.05	88	1.98	2.06	0.07
	Difficulty	200.90	88	2.28	2.36	0.08
	Enjoyment	193.10	88	1.19	0.45	0.02
	Revision	217.19	88	2.47	1.24	0.04

$\eta^2 = \text{SS between groups} / \text{SS total}$

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

4.2. Testing Hypotheses

We will now go through the effect of our manipulations on the DVs, thereby testing hypotheses H1 through H8.

4.2.1. Accountability

Starting with the proposed effect of accountability on psychological distance. Our theoretical framework suggested that making ADMs accountable for their decisions will reduce psychological distance, therefore:

H1: ADM-highs' decision-making should be similar to that of PDMs.

There is no statistically significant difference between the two groups of decision-makers, with a single exception, as seen in Table9 below.

ADM-highs (ADMs with high accountability) and PDMs acting alike indicates that making ADMs accountable for their decisions indeed brings the consequences of their

decisions closer. Hence, the decreased psychological distance created through accountability worked to make ADM-highs behave as if they were making decisions for themselves. Consequently, our results support H1, as these two groups of decision-makers seem to generally behave alike in the studied context.

Table9: Beta-values comparing ADM-highs to PDMs based on their self-reported responses

	5 options	10 options	25 options	50 options
Satisfaction	$\beta=0.5$	$\beta=0.13$	$\beta=0.65$	$\beta=-0.15$
Difficulty	$\beta=-1.06$	$\beta=-1.45^*$	$\beta=0.93$	$\beta=1.13$
Confidence	$\beta=0.13$	$\beta=0.73$	$\beta=0.27$	$\beta=0.48$
Revision	$\beta=-0.85$	$\beta=0.62$	$\beta=-0.81$	$\beta=-0.14$
Enjoyment	$\beta=-0.21$	$\beta=0.00$	$\beta=0.47$	$\beta=-0.03$

* $p<0.05$, ** $p<0.01$, *** $p<0.001$.

β -coefficient measured in units of the variable.

Note: MMR was run, Table9 shows the difference between ADM-highs and PDMs. Presented is the beta-coefficient and p-value for each DV and choice-set size, comparing the two types of decision-makers. A statistically significant p-value indicates a significant difference between the responses of ADM-highs and PDMs within a 95% CI.

4.2.2. Satisfaction

Continuing with satisfaction and how it differs among decision-makers choosing from few or many options. Starting with PDMs, and ADM-highs, in the theory section we argued that:

H2a: PDMs' and ADM-highs' choice satisfaction will first increase, then decrease as choice-sets become increasingly large.

There is some evidence supporting the proposed inverted U-shape of satisfaction, but results are mixed. Study1, round1 (hotel) results show that PDMs report higher satisfaction ($\beta^b=0.87, p<0.05$) when choosing from ten rather than from five options. This suggests that when few options are available, more options yield high marginal benefits overcompensating marginal costs. Thus, when expanding the choice-set from five to ten choices, participants are on the left-hand side of the peak shown in Figure2, satisfaction increasing with more choices. As choice-set size grows further, from ten to 25, satisfaction decreases ($\beta^b=-1.64, p<0.001$). Thus, as predicted by theory, satisfaction for PDMs is described by an inverted U-shape, the ideal choice-set size being between ten and 25. This initial increase and subsequent decline, as confirmed by our data, can be seen in Figure9 and TableG1 in Appendix-G. ADM-highs' choice satisfaction is similarly inversely U-shaped, however, only the decrease in satisfaction between choice-sets of ten and 25 is statistically significant ($\beta^b=-1.19, p<0.05$). This suggests that, while, as can be seen in Figure9, the satisfaction of ADM-highs generally evolves parallel to that of PDMs, effects are mitigated as would have been predicted by CLT (Polman, 2012a; Trope & Liberman, 2003).

Satisfaction - Round1

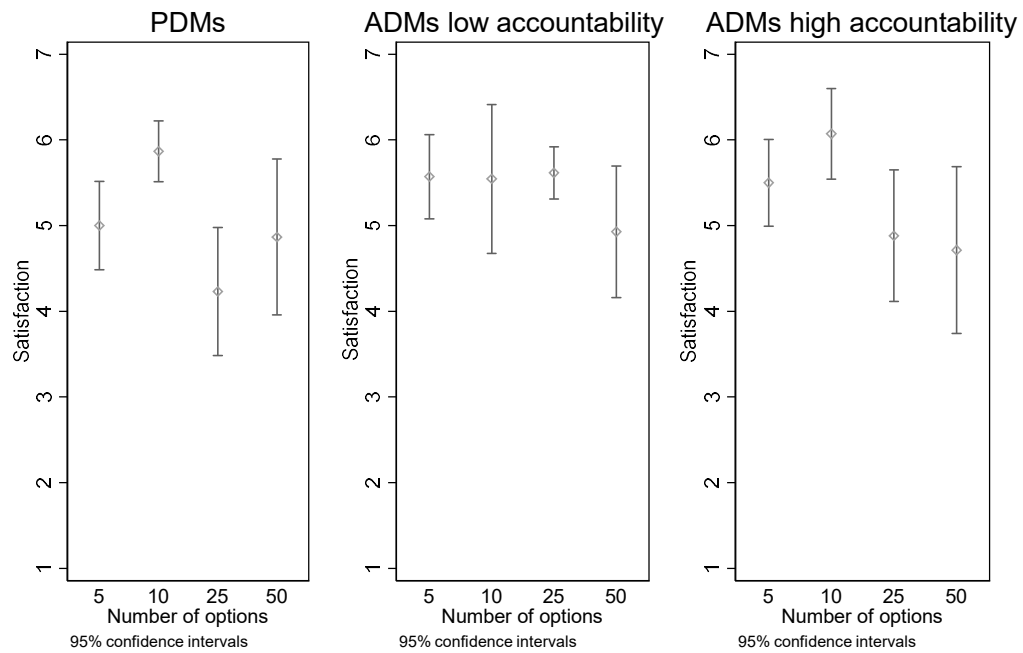
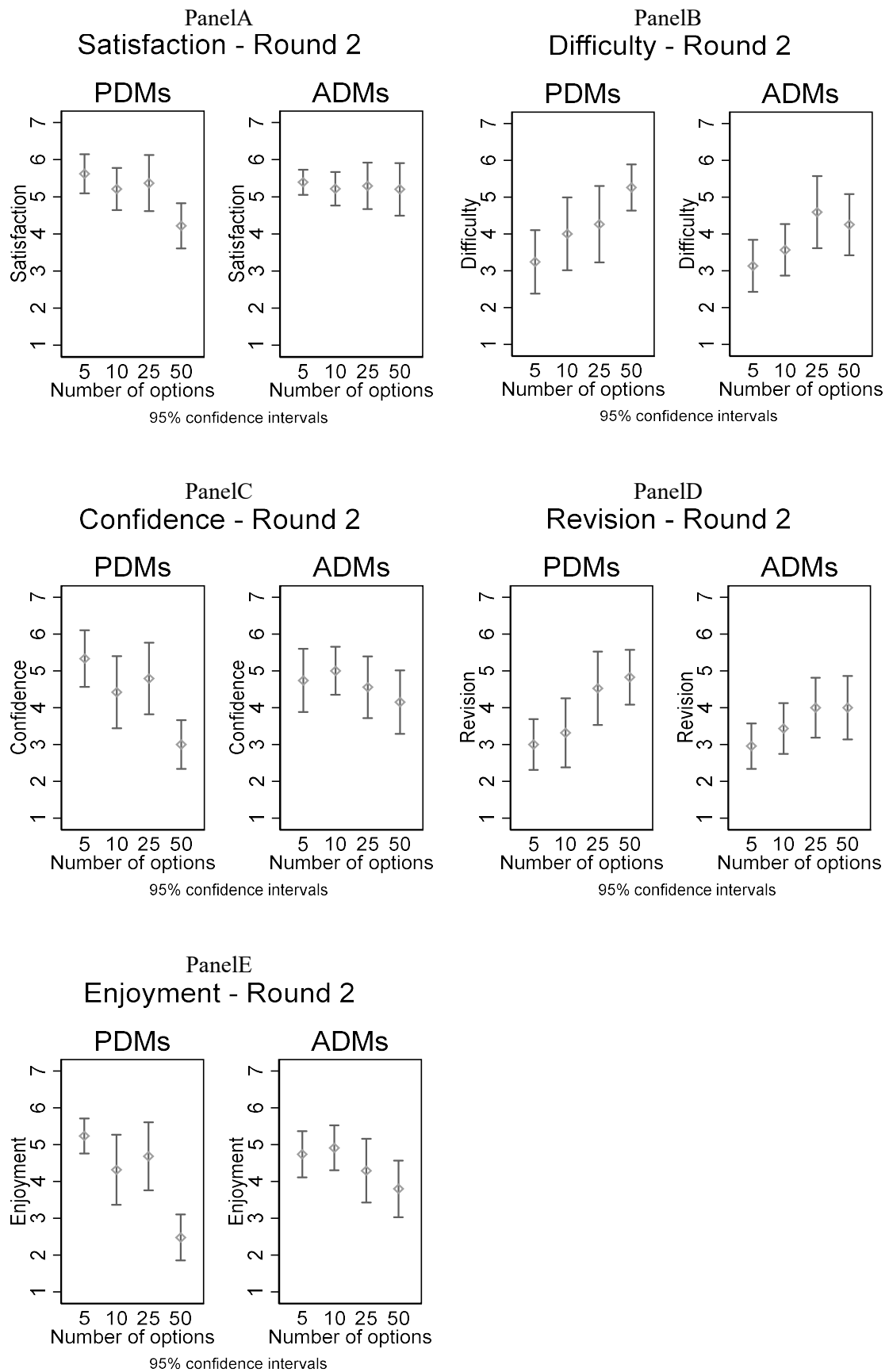


Figure9: Error bars of mean Satisfaction 95% CI, Study1 round1 (hotel)

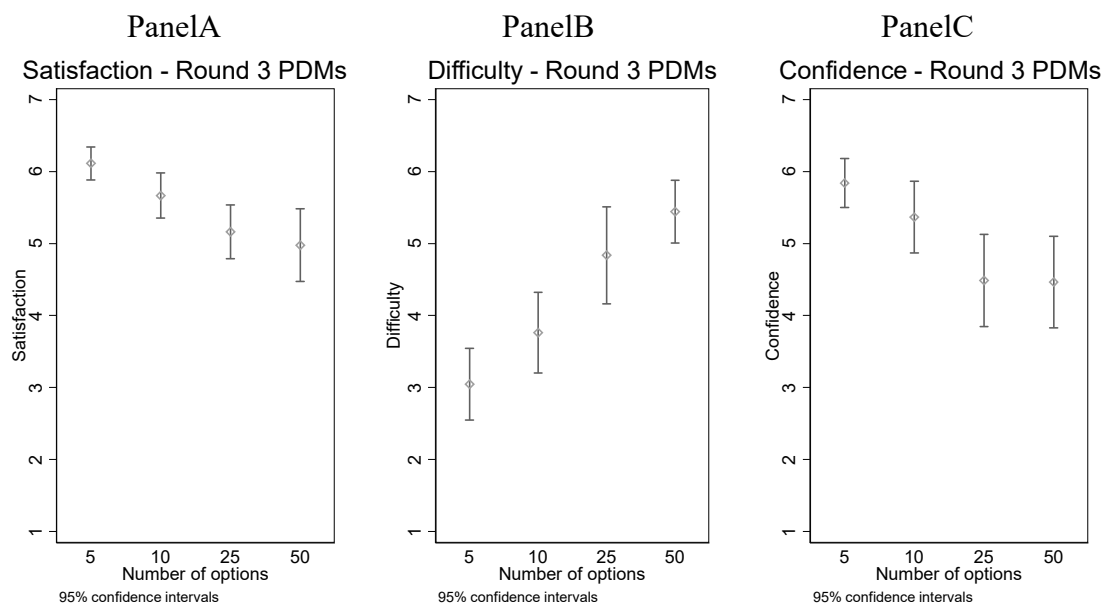
Meanwhile, as visualized in Figure10 PanelA, results of round2 do not support the inverted U-shape but rather indicate that satisfaction monotonously decreases with larger choice-sets. As can be seen in TableG2 Appendix-G, the largest decrease in satisfaction occurs going from 25 to 50 choices ($\beta^b = -1.15, p < 0.005$). Consequently, PDMs choosing from 50 instead of five options were significantly less satisfied with their choice ($\beta^a = -1.40, p < 0.001$).



FigurePanel: 95% CI Study1 round2 (red wine) results of the MMR on satisfaction (PanelA), reported difficulty (PanelB), confidence (PanelC), revision (PanelD), and enjoyment (PanelE)

Figure10: Panel of error bars of mean Satisfaction, mean Difficulty, mean Confidence, mean Revision, mean Enjoyment 95% CI, Study1 round2 (red wine)

Similarly, round3 does not support the inverted U-shape as satisfaction for PDMs decreases monotonously and significantly as PDMs face more options. Compared to the choice-set of five, choice-sets of 25 ($\beta^a=-0.96$, $p<0.001$) or 50 ($\beta^a=-1.14$, $p<0.001$) made decision-makers significantly less satisfied with their choice, as can be seen in Figure11 PanelA and TableG3 Appendix-G.



FigurePanel: Study1 round3 (charities) results on Satisfaction (PanelA), reported difficulty (PanelB), and confidence (PanelC)

Figure11: Panel of error bars of mean Satisfaction, mean Difficulty, mean Confidence 95% CI, Study1 round3 (charity)

While the design of Study2 did not allow to specifically test for the inverted U-shape, results are still in line with overchoice theory. Satisfaction of PDMs in Study2 showed no statistically significant difference between being exposed to a small or a large choice-set ($\beta=0.00$, $p=n.s.$), as presented in TableG4 Appendix-G. Hence, satisfaction level neither increased nor decreased as PDMs were confronted with five or 50 choices. While these results differ from the results of the second and third round of Study1, having used only two differently sized choice-sets does not make these results surprising. Also, in Study1 round1 where statistical significance for the inverted U-shape was found, there is no statistically significant difference for PDMs, when comparing only the smallest (five) to the largest (50) choice-set ($\beta^a=-0.13$, $p=n.s.$). Therefore, as Study2 only uses the two extremes of choice-set size, these results are not surprising and underline the limitations of studies without intermediately sized choice-sets, such as Polman (2012a).

Concluding these findings for PDMs' and ADM-highs' satisfaction, our data only partially supports H2a, as evidence on the initial increase of satisfaction is conflicting, whereas a subsequent drop of satisfaction facing large choice-sets was confirmed by all except Study2.

Now moving on to how the satisfaction of ADMs was impacted by more choice. In our theory section, we reasoned that due to increased psychological distance ADMs are expected to adopt a promotion focus and therefore:

H2b: ADMs' choice satisfaction will increase with choice-set size.

ADMs' choice satisfaction did not change significantly in round1, irrespective of choice-set size, as can be seen in TableG1 Appendix-G. TableG2 shows that these results are confirmed by round2, which again yielded no significant differences in satisfaction for ADMs choosing from differently sized choice-sets. This is in line with the results of Study2, which again corroborated that ADMs' choice satisfaction was the same choosing from small or large choice-sets, as seen in TableG4 Appendix-G.

Concluding, while our data confirms that satisfaction is impacted differently for PDMs and ADMs, our results do not show the overchoice reversal for ADMs proposed by Polman (2012a) and our theory section. Therefore, based on our findings H2b lacks empirical support as our evidence does not show the predicted increase in satisfaction. Nevertheless, there is still a difference between PDMs and ADMs, indicating that psychological distance does mitigate the negative effects of large choice-sets, although, not enough to actually increase satisfaction.

4.2.3. Difficulty

The next DV we looked at was difficulty, as shown in Equation (2). That is, how strenuous decision-makers report they perceived deciding from the choice-set they faced. Our theoretical framework predicted:

H3a: PDMs and ADM-highs experience more difficulties when making decisions from increasingly large choice-sets.

Our empirical results generally support that larger choice-sets make decisions more difficult for PDMs and ADM-highs. Nevertheless, in Study1 round1, there were no significant increases in difficulty reported by PDMs, regardless of choice-set size, as can be seen in TableG5 Appendix-G. However, it is noteworthy that PDMs faced with a choice-set of five in round1 reported higher levels of difficulty than the other groups faced with the smallest choice-set, which could explain why there was no further significant increase. In contrast, ADM-highs report more difficulties when choosing from 25 instead of ten options ($\beta^b=1.53, p<0.01$) and further even more when choosing from 50 instead of 25 options ($\beta^b=1.47, p<0.01$). This significant increase in difficulty reported by ADM-highs is visualized in Figure12. Interestingly, the results of PDMs in round2, are more in

line with our theoretical expectations and the results for ADM-highs in the first round. Round2 indicates that reported difficulty increases with every increase in choice-set size, as seen in Figure10 PanelB. Consequently, PDMs reported that choosing from 25 ($\beta^a=1.21$, $p<0.05$) or 50 ($\beta^a=2.02$, $p<0.01$) options was significantly more difficult than choosing from five (TableG6 Appendix-G).

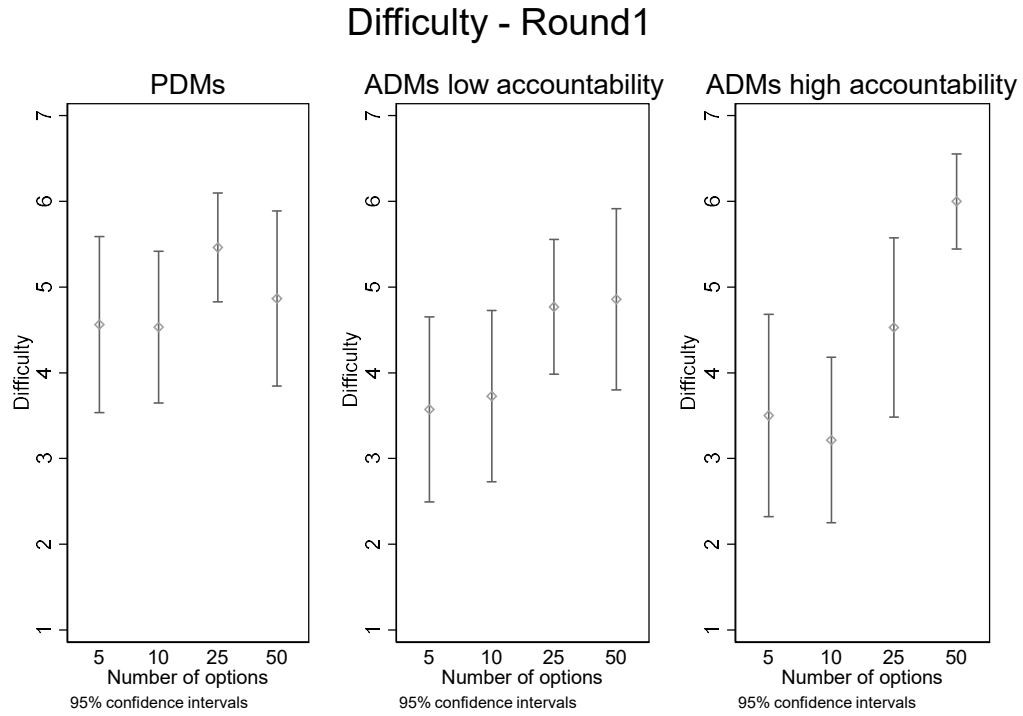


Figure12: Error bars of mean Difficulty 95% CI, Study1 round1 (hotel)

Round3 confirms these findings, as PDMs reported significantly higher difficulties choosing from larger choice-sets, as seen in Figure11 PanelB and TableG7 Appendix-G. While the increase in difficulty between choosing from five to choosing from ten options was only mildly significant ($\beta^a=0.73$, $p=0.053$), choosing from 25 ($\beta^a=1.79$, $p<0.001$) as well as from 50 ($\beta^a=2.40$, $p<0.001$) options was strongly significantly more difficult than choosing from five options.

Similarly, in Study2, PDMs reported difficulty of decision-making increased when confronted with a large choice-set ($\beta=0.95$, $p<0.05$) as seen in TableG8 Appendix-G.

In conclusion, the findings for difficulty reported by PDMs and ADM-highs, are in line with the predictions made in our theoretical framework. As choice-set size increased, PDMs and ADM-highs, except for Study1 round1, reported more difficulties making their decision. The exception of Study1 round1 could be due to the reported difficulty of this round being very high already, which makes the expected significant increases less likely.

Consequently, our results support H3a, as both PDMs and ADM-highs perceive choosing from larger choice-sets as more difficult.

Moving on to ADMs, our theoretical framework predicted that psychological distance alters the impact of increased options on decision-making difficulty. We reasoned that due to ADMs' promotion-focus:

H3b: Experienced decision-making difficulty does not increase for ADMs as choice-set size increases.

Our empirical results do not support this hypothesis, as difficulty increased significantly also for ADMs. In Study1 round1 ADMs reported significantly higher difficulty choosing from 25 ($\beta^a=1.46, p<0.05$) or 50 ($\beta^a=1.55, p<0.05$) options, relative to choosing from five, which is visualized in Figure12. Similarly, in round2 (TableG6 Appendix-G), ADMs reported having more difficulties choosing from 25 ($\beta^a=1.46, p<0.01$) or 50 ($\beta^a=1.12, p<0.05$) rather than from five options, visualized in Figure10 PanelB. Hence, statistically significant increases in difficulty were found in all rounds of Study1, in which ADMs participated.

Study2 equally showed increases in difficulty for ADMs choosing from large choice-sets. However, that effect was not statistically significant, as seen in TableG8 Appendix-G.

These results suggest that the mitigating effect of psychological distance was not strong enough to completely offset the increase in difficulty for ADMs, as was apparent in Study1. Concluding, these results on difficulty for ADMs do not support hypothesis H3b, as reported difficulty increased significantly. Hence, H3b is not supported.

4.2.4. Confidence

Moving on to confidence, our framework predicted that larger choice-sets undermine confidence and hence:

H4a: Choice confidence of PDMs and ADM-highs will decrease as the choice-set size increases.

Our empirical results, in line with our predictions, generally support the hypothesis that confidence will decrease as choice-sets become larger. PDMs in round1 were significantly less confident choosing from 50 than from five choices ($\beta^a=-1.21, p<0.05$), see TableG9 Appendix-G. Figure13 shows that confidence for ADM-highs took a similar development when choice-sets became larger, confidence decreasing as choice-sets expand beyond ten to 25 choices ($\beta^b=-0.96, p<0.01$).

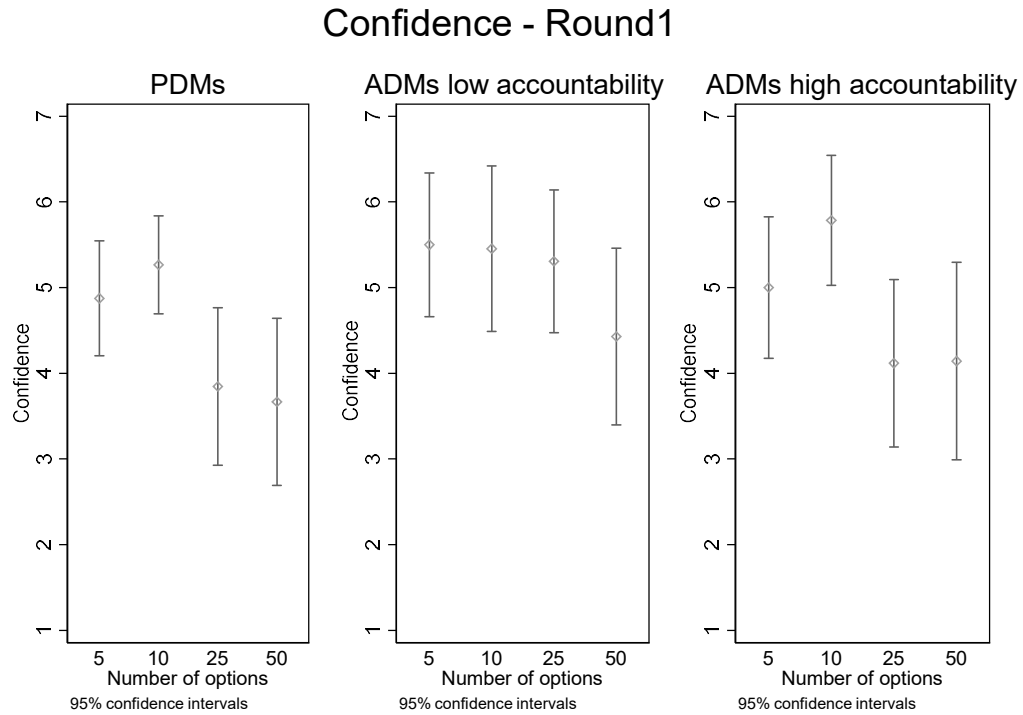


Figure13: Error bars of mean Confidence 95% CI, Study1 round1 (hotel)

Results of round2 resemble the general development of confidence in round1, as PDMs again reported lower confidence when choosing from larger choice-sets, as visualized in Figure10 PanelC. Consequently, PDMs were statistically significantly less confident choosing from 50 instead of five options ($\beta^a=-2.33, p<0.001$) (TableG10 Appendix-G). These results are further supported by round3, in which PDMs again showed decreasing confidence as choice-set size increases, being significantly less confident in their choice choosing from 25 ($\beta^a=-1.42, p<0.001$) or 50 ($\beta^a=-1.44, p<0.001$), compared to choosing from five options as seen in TableG11 Appendix-G.

Study2 similarly showed a decrease in confidence for PDMs, although that effect was not significant ($\beta=-0.27, p=n.s.$), TableG12 Appendix-G.

Concluding, these findings for PDMs' and ADM-highs' confidence, all our data showed decreasing confidence when choosing from larger choice-sets, although that effect was not statistically significant in Study2. This suggests that in line with our theoretical predictions, larger choice-sets lead to decreasing confidence for PDMs and ADM-highs. Therefore, our empirical evidence generally supports the decreased confidence, predicted by H4a.

As explained in the theory section, contrary to PDMs and ADM-highs, we expect ADMs to adopt a promotion-focus and construe the scenario differently, therefore:

H4b: Choice confidence of ADMs will decrease less than for PDMs and ADM-highs as the choice-set size increases.

Our empirical results support that psychological distance mitigates the negative effects that large choice-sets have on confidence. As expected, also ADMs' confidence was impacted negatively by having to choose from larger choice-sets. However, unlike for PDMs, this decrease in confidence was not significant except for Study1 round1 ($\beta^a = -1.26, p < 0.05$). These results suggest that, as predicted by theory, psychological distance mitigated the effect larger choice-sets have on confidence. Therefore, relative to PDMs and ADM-highs, ADMs' confidence was less impacted by large choice-sets, decreases being mostly statistically insignificant, as seen in TableG9, and TableG10 in Appendix-G.

Therefore, our results support H4b, as the decrease in confidence for ADMs choosing from larger choice-sets was insignificant apart from Study1 round1, suggesting that ADMs' confidence is less subject to the negative effects of large choice-sets.

4.2.5. Revision

In our theoretical framework, we argued that being less confident in a choice, should increase the willingness to revise, as low confidence should indicate the belief that better options were available. We therefore expected:

H5a: The willingness to revise a choice will increase as the choice-set size increases for PDMs and ADM-highs.

Our empirical support for this hypothesis is mixed. Looking at Figure14 and Figure10 PanelD, we see that, as expected, revision tends to increase with choice-set size for PDMs, both in round1 and round2. However, as can be seen in TableG13 Appendix-G, for PDMs in round1, this effect is only significant when moving from choice-sets of ten to choice-sets of 25 ($\beta^b = 1.21, p < 0.05$). In round2, said increase in revision was more clearly significant, PDMs being more willing to revise when choosing from 25 ($\beta^a = 1.72, p < 0.01$) or 50 ($\beta^a = 1.83, p < 0.001$) compared to choosing from five options (TableG14 Appendix-G). Meanwhile, ADM-highs showed no statistically significant increase in revision, despite positive beta values, just like PDMs in Study2, as can be seen in TableG14 and TableG15 Appendix-G. This is not completely surprising, as also the decrease in confidence that is expected to cause the increased willingness to revise, was not statistically significant in Study2.

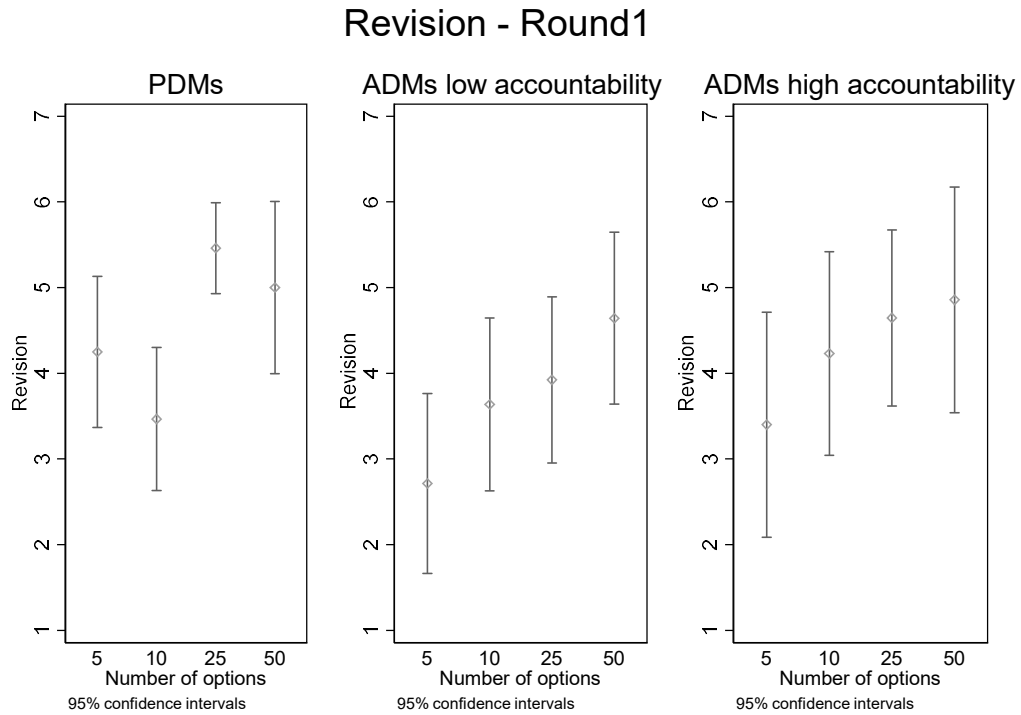


Figure14: Error bars of mean Revision 95% CI, Study1 round1 (hotel)

Concluding these findings on revision for PDMs and ADM-highs, we can reject H5a for ADM-highs, whereas the evidence for PDMs is contradictory. Therefore, H5a is only partially supported by our data.

Following our reasoning on ADMs' willingness to revise in the theory section, we expected:

H5b: The willingness to revise a choice as the choice-set size increases will increase less for ADMs than for PDMs and ADM-highs.

Also for ADMs, our empirical results for revision were mixed. Unlike expected by theory, our data suggests that the willingness to revise did not clearly increase less for ADMs than for PDMs. As can be seen in TableG13 Appendix-G, the increase in revision in round1 was higher for ADMs ($\beta^a=2.18$, $p=0.001$) than for PDMs ($\beta^a=0.75$, $p=n.s$). Meanwhile, as visualized in TableG14 Appendix-G, in round2 increase in revision was still significant for ADMs ($\beta^a=1.04$, $p<0.05$), but this increase was less in extent than for PDMs ($\beta^a=1.83$, $p<0.001$). Hence, our results are contradictory regarding the question of whether revision increases more or less for ADMs relative to PDMs. These contradictory results are somewhat surprising, as they challenge the proposed link between confidence and willingness to revise.

Our contradictory evidence thus only partially supports H5b.

4.2.6. Enjoyment

Now we look into whether PDMs and ADMs enjoyed the process of making decisions from differently sized choice-sets, in accordance with Equation (5). In the theory section we argued:

H6: ADMs' decision enjoyment will decrease less when choice-set size increases than PDMs'.

Overall, our empirical results support that ADMs' decision-making enjoyment is less compromised by large choice-sets than that of PDMs. As generally expected from our theoretical framework, participants' enjoyment decreased as choice-sets became larger. In Study1 round1 ($\beta^a = -1.28, p < 0.05$) and round2 ($\beta^a = -2.76, p < 0.01$) PDMs experienced significant decreases in enjoyment between choice-sets of five and 50, as can be seen in TableG16 Appendix-G. This indicates that the proposed costly implications of large choice-sets worked to decrease the enjoyment of PDMs making decisions, as was expected by our framework. While our data also showed a decrease for ADM-highs, this decrease was not significant. For ADMs the decrease in enjoyment was not significant in round1, whereas it was significant in round2 ($\beta^a = -0.94, p < 0.05$), although less than for PDMs. Hence, enjoyment decreased more for PDMs than for ADMs, as can also be seen looking at the β^a values in TableG16 and TableG17 in Appendix-G. Therefore, in line with our hypothesis, it seems that psychological distance and what it implies for the factors that make deciding enjoyable listed by Polman and Wu (2020), worked to mitigate the negative effects of large choice-sets on decision enjoyment.

Meanwhile, contrary to our theoretical predictions, in Study2, the decrease in enjoyment was not statistically significant for ADMs nor PDMs, as can be seen in TableG18 Appendix-G. However, it should be noted that the design of Study2 differed fundamentally from that of Study1, which certainly has implications for the enjoyment of making decisions in these two studies. Hence, results on enjoyment for these two studies should only be compared with caution, if at all, as they may suggest more about the enjoyability of the study design and less about the impacts of larger choices as such.

Concluding our findings in Study1, our results support H6, although it should be noted that the evidence from Study2 does not corroborate this.

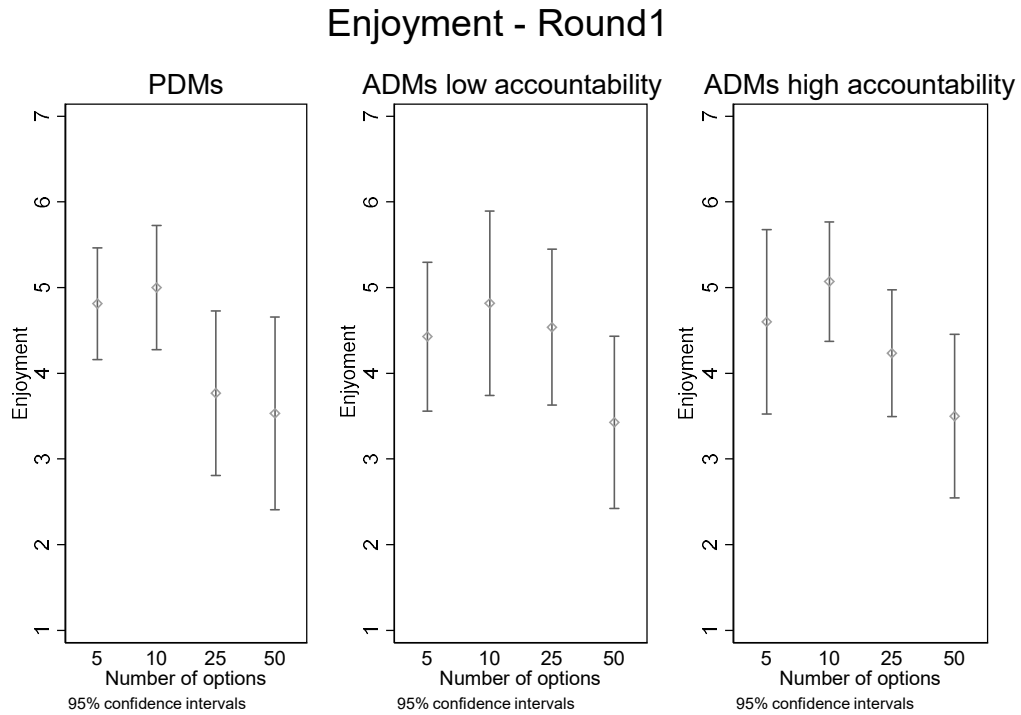


Figure15: Error bars of mean Enjoyment 95% CI, Study1 round1 (hotel)

4.2.7. Percentage of Options Looked At

In Study2 we were interested in, among other things, whether PDMs and ADMs differ regarding the quantity of information they request, that is how many options they look at before deciding. Following the arguments made in the theory section we expected that:

H7: PDMs look through a larger percentage of their available options than ADMs.

Contrary to what we expected based on our theoretical reasoning, there is no evidence of PDMs considering a larger percentage of their available options than ADMs. Regardless of whether the comparison is made based on the small or the large choice-set used in Study2, as is showcased in Table11, there is no statistically significant result indicating a difference between PDMs and ADMs. Therefore, H7 is not supported, as there is no statistically significant evidence that ADMs require less information to make their decision as they do not look at a smaller percentage of their available options.

Thus, our empirical data does not support that psychological distance alters the percentage of available options that decision-makers look at. As can be seen in Table10 when faced with a choice-set of 50 compared to five, both PDMs ($\beta=-0.44, p<0.001$) and ADMs ($\beta=-0.53, p<0.001$) looked through a statistically significant smaller percentage of options available in their choice-set. This result is not surprising, considering that looking through five options is relatively quick and easy compared to extensively studying all options in a choice-set ten times as large.

Table10: Percentage of options considered comparing choice-set size five and 50 for PDMs and ADMs separately

	PDM				ADM			
	β	SE	95% CI		β	SE	95% CI	
			LL	UL			LL	UL
C	0.94	0.04	0.85	1.03	1	0.03	0.93	1.06
50	-0.44***	0.06	-0.56	0.31	-0.53***	0.05	-0.63	-0.43

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice set = 5.

b = beta compared to the next smaller choice-set.

Table11: Percentage of options considered comparing PDMs to ADMs within the same choice-set size

	Choice-set size=5				Choice-set size=50			
	β	SE	95% CI		β	SE	95% CI	
			LL	UL			LL	UL
C	0.94	0.03	0.88	0.99	0.50	0.05	0.40	0.60
ADM	0.06	0.04	-0.01	0.14	-0.03	0.07	-0.17	0.11

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

4.2.8. Information Looked At

Lastly, following CLT, we expected PDMs to focus more on feasibility-aspects of a given option, and ADMs to focus more on desirability-aspects, as has been found by Lu et al. (2013). Therefore, we expected that:

H8: ADMs and PDMs focus on different information when deriving their decision.

Our empirical evidence finds no support for the claim that ADMs and PDMs focus on different information. Looking at the different pieces of information that were provided in Study2, our results show that there was no statistically significant difference between PDMs and ADMs. This applied to all information types that we provided about the different hotel options in Study2, as can be seen in Table12 below.

Table12: t-test, Information persuading decision-makers

Group	PDM		ADM		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Name	1.34	3.24	1.07	2.90	0.42	0.67
Stars	14.43	12.67	18.78	14.51	-1.50	0.14
Reviews	13.64	12.08	16.00	11.30	-0.94	0.35
Price	21.54	18.36	19.70	15.16	0.52	0.61
Location	21.09	18.26	16.16	14.65	1.41	0.16
Highlights	10.02	13.36	7.15	8.03	1.23	0.22
Picture1	6.57	9.07	9.11	11.93	-1.13	0.26
Picture2	11.36	15.58	11.00	10.82	0.13	0.90

Therefore, we find no support for the differing informational focus that CLT claims PDMs and ADMs to adapt. As a result, H8 is not supported.

4.3. Overview of Results and Hypotheses

Table13: Summary of Results

Research Question (RQ)	Hypotheses	Results
(1) To what extent does the number of options impact the satisfaction of decision-makers deciding for themselves or others in line with the choice overload hypothesis?	H1 ADM-highs' decision-making should be similar to that of PDMs. <i>Study1</i> .	Supported
	H2a PDMs' and ADM-highs' choice satisfaction will first increase, then decrease as choice-sets become increasingly large. <i>Study1 and Study2</i> .	Partially supported
	H2b ADMs' choice satisfaction will increase with choice-set size. <i>Study1 and Study2</i> .	Not supported
(2) To what extent does self-/other decision-making impact reactions of being exposed to choice overload beyond satisfaction?	H3a PDMs and ADM-highs experience more difficulties when making decisions from increasingly large choice-sets. <i>Study1 and Study2</i> .	Supported
	H3b Experienced decision-making difficulty does not increase for ADMs as choice-set size increases. <i>Study1 and Study2</i> .	Not supported
	H4a Choice confidence of PDMs and ADM-highs will decrease as the choice-set size increases. <i>Study1 and Study2</i> .	Supported

	H4b Choice confidence of ADMs will decrease less than for PDMs and ADM-highs as the choice-set size increases. <i>Study1 and Study2.</i>	Supported
	H5a The willingness to revise a choice will increase as the choice-set size increases for PDMs and ADM-highs. <i>Study1 and Study2.</i>	Partially supported
	H5b The willingness to revise a choice as the choice-set size increases will increase less for ADMs than for PDMs and ADM-highs. <i>Study1 and Study2.</i>	Partially supported
	H6 ADMs' decision enjoyment will decrease less when choice-set size increases than PDMs'. <i>Study1 and Study2.</i>	Partially supported
(3) To what extent does self-/other decision-making impact the amount and type of information decision-makers consider before choosing?	H7 PDMs look through a larger percentage of their available options than ADMs. <i>Study2.</i>	Not supported
	H8 ADMs and PDMs focus on different information when deriving their decision. <i>Study2.</i>	Not supported

4.4. Differences Between Study1 and Study2

Throughout section 4.2, some differing results between Study1 and Study2 transpired. First visible in the ANOVA Table8 the groups in Study1 showed significant difference for every DV throughout the study, whereas in Study2 this was not the case for any DV.

Attempting to rationalize bespoke differences, the first aspects to be considered are the differences in the design of Study1 and Study2. Despite our efforts to make them visually similar, the study designs were fundamentally different. In Study1 participants were faced with all options together, whereas in Study2 participants had to click on each option individually to see the available information. The design of Study2 required more effort, with the additional clicks, when inquiring information compared to Study1 where participants were presented information straight away. This could have led to the mitigation of the overchoice effect as participants in Study2 were potentially less overwhelmed with the amount of visible information as well as complexity. Moreover, the way information was presented might have led to Study2 participants considering fewer options than Study1 participants. However, as we have no way of knowing how many options participants in Study1 considered, this cannot be explored further based on the data available.

Another potential explanation is that the pool of participants differed between Study1 and Study2. All Study2 participants were paid to take the study. In Study1 on the other hand, participants were recruited through our personal networks. This could have caused a bias where participants in Study1 cared to do the study thoroughly because they cared to help. Whereas in Study2 participants rushed through the study to get paid for least effort, hence paying less attention to the abundance of options and therefore being less impacted by overchoice.

Finally, a possible explanation could be potential cultural differences between the participants. Overchoice might be experienced differently under different cultural circumstances. In Study1 16.9% of participants had nationalities from outside of Europe, whereas in Study2 30.3% of respondents were non-European. Cultural differences could be one explanation for differing results.

4.5. Additional Findings

Our data also produced findings beyond what we wanted to test with our hypotheses. Some of the most interesting additional findings will be presented below.

- An interesting additional finding in our data is that apparently, the relationship between enjoyment and the number of available choices follows an inverted U-shape. Initially, as choice-sets become larger, enjoyment increases but starts to decrease as choice-set size increases further. This relationship, to a degree held true in all cases in which we tested for enjoyment and is visualized in Figure15 and Figure10 PanelE. Although the bespoke initial increase in enjoyment was not statistically significant for any of our decision-making rounds, it being apparent in every round, regardless of whether decision-makers were PDMs or ADMs, makes it worth mentioning.

Building on this, further research could investigate enjoyment in-depth, to uncover more detailed insights about how enjoyment develops as choice-sets become larger and the way of presenting information is altered.

- Further, the purpose of Study1 round3 (charities), was to enable a comparison between hypothetical decisions and decisions with real consequences. It was expected that PDMs in round3 would get impacted more by the negative effects of large choice-sets as hypotheticality, which can evoke psychological distance (Trope & Liberman, 2003), is removed in this real-life decision. Our data only confirms this reasoning for difficulty, as round3 PDMs report stronger increases in difficulty than in both round1 and round2 (TableG5-G7 Appendix-G). While this could also indicate that choosing charities is inherently more difficult than choosing a hotel or wine, the non-hypothetical nature of round3 likely made the decision more difficult, as the decision itself is less impactful in round3.

5. Discussion

Goal of our thesis was to generate new insights regarding specific aspects of the overchoice phenomenon. Particularly, we set out to answer our research questions:

- RQ1) To what extent does the number of options impact the satisfaction of decision-makers deciding for themselves or others in line with the choice overload hypothesis?
- RQ2) To what extent does self-/other decision-making impact reactions of being exposed to choice overload beyond satisfaction?
- RQ3) To what extent does self-/other decision-making impact the amount and type of information decision-makers consider before choosing?

In the results section above, these three questions were evaluated using the data we collected in two empirical studies. These questions shall now be answered and discussed.

5.1. General Discussion

5.1.1. Decreased satisfaction for PDMs and ADM-highs, no change for ADMs (RQ1)

Our results indicated that more indeed can be less, challenging foundations of standard theory, in line with previous research such as Iyengar and Lepper (2000) or Schwartz (2016).

In the first round of Study1, both PDMs and ADM-highs showed evidence of the characteristic inverted U-shaped satisfaction, proposed by the overchoice hypothesis. However, for Study2 there were no significant results. While the initial increase in satisfaction seen in Study1 was only significant for PDMs, Figure9 clearly shows the characteristic shape for both PDMs and ADM-highs. Accordingly, the impact of the increased number of options did not significantly differ between PDMs and ADM-highs, indicating that the impact of large choice-sets does not differ between these two groups. Meanwhile, in the other rounds, PDMs reported monotonously decreasing satisfaction, as options became more abundant. This shows that more options can lead to lower satisfaction, as proposed by the overchoice theory (Chernev et al., 2015).

Meanwhile, the overchoice hypothesis does not seem to apply to the satisfaction of ADMs. Psychologically distant ADMs showed no significant difference in satisfaction regardless of choice-set size. This suggests that making decisions for someone else mitigates the negative impacts of overchoice on satisfaction. However, the effect of psychological distance seemingly is not strong enough to support the reversed overchoice effect proposed by Polman (2012a).

Concluding, the choice overload hypothesis holds for the satisfaction of PDMs and ADM-highs, except for the contradicting evidence on the initial increase. Therefore, it holds to

the extent that more options can lead to lower satisfaction. Meanwhile, the hypothesis does not hold for psychologically distant ADMs, who showed no significant difference in satisfaction regardless of the number of options, indicating the mitigating role of psychological distance. It should also be noted that the evidence from Study2 is contradicting, this could be a result of study design and task characteristics as suggested by Reutskaja and Hogarth (2009).

5.1.2. Mitigated effects of overchoice when deciding for someone else (RQ2)

Psychological distance mitigates the negative effects of abundant options on ADMs in the case of difficulty, confidence, and enjoyment. As a result of making the decision for someone else, ADMs were thus less impacted by the adverse effects proposed by overchoice theory. This is in line with CLT, arguing that the decision-making scenario is construed differently when decisions are made for someone else (Trope & Liberman, 2003). Nevertheless, in most cases, the effect of psychological distance did not go as far as completely offsetting the negative implications of large choice-sets.

For the case of the DV revision, no clear mitigating effect of psychological distance was found. That means ADMs were not significantly less likely to be willing to revise their choice than PDMs.

Generally, high accountability seemed to offset the effect of making the decision for someone else, confirming the findings by Polman (2012a). As psychological distance was reduced by manipulating high accountability, our results have shown no significant differences between PDMs and ADM-highs for all tested DVs. This underlines that the mitigating effect of making decisions for someone else disappears as psychological distance is reduced.

In conclusion, under the prerequisite of low accountability, making the decision for someone else, mitigates the negative effects of choice overload on factors beyond satisfaction, namely perceived difficulty, confidence, and enjoyment.

5.1.3. No differences in the amount and type of information considered in the underlying process of overchoice (RQ3)

Contrary to our theoretical predictions based on CLT (Lu et al., 2013), PDMs and ADMs do not differ regarding the amount and type of information that is considered when choosing from differently sized choice-sets. For the first time looking into the “black-box” of the underlying process of overchoice, our Study2 uncovered that the percentage of available options looked at was significantly smaller when faced with large instead of small choice-sets. However, when comparing PDMs to ADMs, holding choice-set size constant, there were no significant differences. There were equally no significant differences regarding the type of information that participants based their decision on.

Concluding, these findings indicate that, based on the parameters we looked into, whether the decision is made for oneself or someone else does not alter the underlying processes such as what information the decision was based on or how many options are considered. Hence, making the decision for someone else does not alter the type and quantity of information that is considered.

5.2. Implications

5.2.1. General Implications

Our results have shown that sometimes more can be less, supporting the phenomenon of choice overload popularized by Iyengar and Lepper (2000). We have shown that more options can have negative implications for factors such as satisfaction, confidence, or enjoyment. These findings challenge the way modern capitalistic societies are structured and the standard economic theory these societies are based on, as they strive for maximizing the freedom of choice does not necessarily make decision-makers end up better.

Despite having confirmed that there are negative effects of too much choice, our results do not support all claims that overchoice theory makes. This underlines the nature of the choice overload phenomenon. Reality is not as simple as theory would have it. While we have presented empirical support for overchoice, it does not happen to everyone or under every circumstance. Hence, our results are more in line with the faction of Chernev et al. (2015) than with Scheibehenne et al. (2010), as we found evidence for overchoice but acknowledge its hard-to-grasp nature. Nevertheless, as our two studies did not yield completely identical results, despite efforts of making them similar, the argumentation of Scheibehenne et al. (2010) should be kept in mind, especially given the circumstances of the replication crisis (Dreber & Johannesson, 2019; Open Science Collaboration, 2015). Therefore, it is difficult to make accurate predictions based on choice overload, as it is still uncertain when and to whom it occurs. Moreover, as has been shown by Reutskaja and Hogarth (2009), even for the same individual some decision-making scenarios may evoke overchoice, whereas other objectively similar ones do not. This could explain why overchoice was more pronounced in our first relative to our second study. Hence, while we should generally acknowledge that there can be too much choice, and more can be less, it is not possible to predict whether a specific situation and task would evoke overchoice in a certain individual.

Moreover, in line with the findings of Polman (2012a), we have shown that making decisions for someone else generally seems to mitigate the negative effects of choice overload. Therefore, in situations where one experiences overchoice, it seems reasonable that introducing psychological distance can help decision-makers making decisions. This does not necessarily mean one should leave such decisions to someone else, instead psychological distance can be evoked by several dimensions. One could hypothetically

have the decision made by someone else, asking oneself what would I advise a friend to do in this situation, or what would I decide if it was a temporary-distant situation?

5.2.2. Managerial Implications

Given that it is not possible to predict exactly when and to whom overchoice will apply, it is difficult to provide precise recommendations for managers. However, managers should be aware that choice overload exists and that its effects can be mitigated by psychological distance, which has some implications on for example, how product offerings should be presented to customers to avoid overload.

One example of such could be e-commerce. Instead of trying to impress customers with a vast number of options, few but selected alternatives could be shown to avoid the negative impacts on satisfaction, confidence, or enjoyment. Our results in Study2 have shown that when presented with many options, participants ignore a large share anyway. Given the advancement of algorithms, it should be possible to present decision-makers with options that correspond to their underlying preferences, filtering out options based on abstract categories much like ADMs do, thereby avoiding overload for the decision-maker.

Moreover, ADMs being less impacted by overchoice by abstracting situations and being less subject to situational aspects such as emotions can also be valuable for managerial decision-making. When managers are overloaded with the amount of directions they could steer their company to, an ADM, for example in the form of a consultant, can construe the situation differently. Consequently, the ADM can support by making decisions or at least offering suggestions based on that differed construal.

5.3. Limitations

Our studies are subject to some limitations that should be kept in mind. Despite our efforts, the number of analyzable responses in Study1 was below the calculated target number of participants. Therefore, given more time and resources, we would have liked to recruit more participants, which likely would have led to more robust results and fewer contradictions. Additionally, with a larger number of participants, more control variables could have been implemented in the study to, again, obtain more robust results and gain additional insights.

Secondly, as pointed out in the methodology section, the participants in Study1 were recruited using convenience sampling, which has some drawbacks regarding the generalizability of the results (Bryman & Bell, 2011). However, representative sampling is not common in overchoice research and is arguably not possible given the proposed general validity of the phenomenon. Another generalizability issue concerns the concrete decision-making scenarios we created. While participants had to make several decisions

– choosing a hotel, selecting a bottle of wine, and choosing a charity – these are naturally only fractions of the variety of choices we make. However, no study on overchoice could realistically reflect the whole diversity of choice. With that said, asking participants to make several decisions made our study more realistic than most studies using one-shot decisions, considering the numerous decision we make daily.

Moreover, except for the charity decision, the participants' decisions were hypothetical. Lack of real consequences imposes some psychological distance to the decision (Trope & Liberman, 2003), also for PDMs, for which we wanted to make the decision as proximate as possible. As a result of this hypothetical nature, and the low impact of the charity decision, all the decisions could be considered lower-impact decisions (Schwartz, 2016). This is a shortcoming we are aware of. However, more impactful decisions were not realistic given the scope and budget for this thesis, and our results show that also our low-impact decisions were sufficient to evoke choice overload.

5.4. Directions for Future Research

Whereas one possibility for future research lies at hand, replicating our study with more statistical power, we also identified other interesting directions. Some of those are shortly touched upon below.

As our Study2 only investigated quantitative aspects of the underlying process of overchoice, that is how much and which information is considered by decision-makers when deciding, future research could explore qualitative aspects of the process. That is, for example, using think-aloud methods, what is going on in the head of decision-makers when being confronted with differently sized choice-sets? Such a study could complement the findings of our thesis, providing more explanations regarding when and to whom overchoice happens.

Another identified path for future research is expanding the research on overchoice making decisions for self or others beyond consumption decisions. This could include for example how are managers, making decisions for their employees, impacted by choice overload? The results of such research would be interesting to compare to our findings, as they would indicate whether our findings, and also those of most previous research on overchoice, are limited to consumption decisions or whether wider generalizations are possible.

Thirdly, it would be interesting to conduct a longitudinal study of the research questions we asked. Such a study could generate interesting insights as it would allow to study parameters such as regret and choice deferral, which take time to develop. Further such a study could investigate how consistent decision-makers are in their decisions and how they perceive decision-making scenarios.

Now reflecting on the introductory example of picking a gift with the new insights we got. Even if it might be the easy way out for us to gift money or gift cards, if we really want to make the giftee happy and satisfied, maybe we, as a more psychologically distant decision-maker, should put in more effort and make a decision for the giftee instead of confronting her with the myriad of choices out there.

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7. Appendices

7.1.1. Appendix-A Literature Overview

This appendix should provide an overview about the literature on overchoice and self-other decision-making. It is neither exhaustive in terms of the vastness of literature that exists for both topics, nor does the list cover all the theoretical foundation our thesis is built on. Rather, it lists the most influential readings for our work, either in terms of concepts or methodology, in alphabetical order. For a full list of sources please refer to the references section.

Author	Year	Title	Journal	Countries of Respondents	Relevant concepts/Variables	Summary of Findings	Methodology
Carrol L., White M., Pahl S.	2011	The impact of excess choice on deferment of decisions to volunteer	Judgment and Decision Making	UK	Decision difficulty and overchoice Decision deferment Opportunity costs of similar choices	When faced with larger choice-sets, decision-makers consider more options and are more likely to defer decision-making. This consequence of large choice-sets is mediated through choice difficulty and confidence. Further, this study extended choice overload research on non-material but more impactful choices, in this case volunteering decisions.	Two studies, the first investigated the relationship between the number of options considered and choice deferral, by giving participants a list of volunteering possibilities and then asking follow-up questions. These questions concerned difficulty, number of options considered etc. In the second study, participants were randomized into treatments with differently sized choice-sets of volunteering possibilities. Then again follow-up questions were asked. The interface used by the authors allowed

Chernev, A.; Böckenholt, U.; Goodman, J.	2015	Choice overload: A conceptual review and meta-analysis	Journal of Consumer Psychology	Various	-	Choice overload is a valid effect, however it does not occur to everyone under all circumstances. Identification of four key variables that lead to overchoice. Likewise showing how choice overload can be measured in different dimensions, such as satisfaction, deferral etc.	them to record how many options candidates considered.
Iyengar, S. S.; Lepper, M. R.	2000	When Choice is Demotivating: Can One Desire Too Much of a Good Thing?	Journal of Personality and Social Psychology	USA	Overchoice, Satisfaction,	Individuals are more prone to purchase gourmet jams or chocolates, or write an extracurricular essay, at a higher quality, when faced with a choice-set of 6, rather than 24 or 30 different choices.	Meta study 3 experimental studies were performed. Study 1 was a field experiment in a supermarket where displays of jam samples were set up, with 6 or 24 different tastes. The study measured customer purchases of jam. Study 2 was a field experiment that offered students extra credit for handing in an essay. Students were faced with 6 or 30 topics to write about. In study 3 a lab experiment was conducted that investigated participant satisfaction with their choice of chocolates made from a sample of 6 or 30.

Kray, L. J.	2000	Contingent Weighting in Self-Other Decision-Making	Organizational Behavior and Human Decision Process	USA	Self-other decision-making	Advisors (choosing for others) are more likely to choose according to general norms than are personal decision-makers. It also suggests that advisors incorrectly assume the preferences of others and suffer fewer negative implications of choosing than do personal decision-makers.	Three studies were conducted using laboratory experiments with college students whose treatment indicated who they would make decisions for. In the first study participants were asked to choose between two jobs based on an indicated attractiveness of salary and personal satisfaction. In the second study participants were asked to choose from elective classes. Prior to choosing they were asked to rate their personal preferences. In the third study participants chose amongst volunteer opportunities. It tested for prioritization of personal attributes and opinions as well as the choice.
Lenton, A.P.; Fasolo, B.; Todd, P.M.	2008	“Shopping” for a Mate: Expected versus Experienced Preferences in Online Mate Choice	IEEE Transactions on Professional Communication	UK	Affective response, Anticipated and experienced choice satisfaction, Regret, Difficulty with choices	Participants anticipate that more choice is not strictly better and that facing excessive options can be detrimental. However, people misjudge the point at which marginal costs surpass marginal benefits of an added choice. More choice can feel the same as less choice (not better) but can lead to	Two studies, the first being a survey handed out to students, introducing them to an online dating scenario. Participants were then asked to indicate expected difficulty, satisfaction, regret, and enjoyment for differently sized choice-sets. In the second study, students were randomized into four treatment groups with differently sized choice-sets. In the same online dating setting,

Lu, J., Xie, X., Xu, J.	2013	Desirability or feasibility: self-other decision-making differences	Personality & Social Psychology Bulletin	China	Construal level theory, Desirability, Feasibility	worse decision outcomes as more superficial heuristics are used increasing the propensity to miss the actual best option.	participants had to select the person they would like to meet most. On a scale, participants then had to report their experienced difficulty, satisfaction, regret, and enjoyment.
Park, J.; Jang, S.	2013	Confused by too Many Choices? Choice Overload in Tourism	Tourism Management	USA	-	Making decisions for oneself, decision-makers focus on the feasibility of options. Making decisions for others, decision-makers focus on desirability of options. This has been shown in the pre-decision, decision, and post-decision phase.	Three studies, randomizing participants into decision-making for themselves or for others. Then had to select between options with varying combinations of desirability and feasibility.
						Irrespective of chosen destination, a choice-set size exceeding 22 increased the probability of choice avoidance and regret. This paper extends the overchoice hypothesis to the travelling industry. That was an addition to existing theory as tourism has some special characteristics. Travelling involves intangible services, novelty-seeking behaviour, risk taking and more considerable financial and	First a pretest was made to identify one familiar and one unfamiliar destination. Then students were assigned into 2x5 different treatments. This means participants faced a differently sized choice-set (1, 3, 10, 20, 30) for either a familiar or unfamiliar destination. Under time pressure, participants then had to decide on a hotel from their choice-set. Subsequently, decision-makers were asked to indicate perceived regret and familiarity.

Polman, E.	2012	Effects of Self-Other Decision-making on Regulatory Focus and Choice Overload	Journal of Personality and Social Psychology	USA	Overchoice Self-other decision-making Regulatory focus	non-financial commitments, than the average consumption decision. Evidence for choice overload as well as choice overload reversal explained by regulatory focus when making decisions for self, versus making decisions for others. Furthermore, introducing accountability or close social proximity lead to self-other choices resembling each other.	Five studies in total, including hypothetical and real choices regarding paint, wine, ice cream flavor, school courses. In field and lab-settings, participants were asked to make decisions either for themselves or others and then had to rate their satisfaction and regret. Additionally, for study 4 social distance was manipulated by priming participants that had to circle specific pronouns in a text before engaging in decision-making. Finally, study 5 manipulated accountability, by informing randomly selected participants that they will have to justify their choices.
Polman E., Vohs K.D.	2016	Decision Fatigue, Choosing for Others, and Self-Construal	Social Psychological and Personality Science	USA	Construal Level Theory, Decision Fatigue, Enjoyment	Decision-making for others is more enjoyable than decision-making for oneself. It is also less exhausting, thereby reducing the tendency to stay with the status quo	Three studies, randomizing participants into treatments of decision-making for themselves or others. In each study, factors related to the decision are then measured such as fatigue, status-quo preference, self-control, or enjoyment.

Scheibeh enne B., Greifene der R., Todd P.	2010	Can There Ever Be Too Many Options? A Meta-Analytic Review of Choice Overload	Journal of Consumer Research	Various	-	The mean effect of choice overload seems to be close to zero. Furthermore, necessary conditions for overchoice could be identified in the absence of pre-defined preferences and dominant options. However, sufficient conditions could not be identified.	Meta study
Schwartz , B.	2016	The Paradox of Choice – Why More is Less (Revised Edition)	N.A.	N.A.	Choice overload, Enjoyment, Difficulty, Regret, Satisfaction, Complexity, Expertise, Confidence	This book argues for the existence of overchoice effect. It is stated that by reducing the number of choices available to individuals and consumers the experienced anxiety can be greatly reduced.	Literature review in book format.
Szrek, H.	2017	How the Number of Options and Perceived Variety Influences Choice Satisfaction	Judgement and Decision- making	USA	Perceived variety	Choice-set size does not enhance perceived benefits and satisfaction, when perceived variety is controlled for. Instead, increasing choice- set size heightens perceived costs. This confirms the hypothesis that perceived variety is more important for choice satisfaction than the actual number of options.	Elderly panel members were introduced into a scenario in which they had to choose between different drug plans. Participants were randomized into low and high variety treatments, in which they were further randomized into differently sized choice-sets. After having made a decision, participants were asked to answer questions on perceived variety, difficulty, whether they

Trope Y., Liberman N.	2003	Temporal construal	Psychologi cal Review	N.A.	Construal Level Theory, High-level construal, Low- level construal, Psychological distance	Further it is shown that perceived variety mediates the effect of choice-set size on satisfaction. Psychological distance changes how people interpret the same information. Psychological distance can be induced by temporal or spatial distance but also by making decision for someone else or making hypothetical instead of real decisions.	perceived the number of options as too high/low, satisfaction, and desire to choose more than one option. Literature review.
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7.1.2. Appendix-B Participant Nationalities

TableB1: Participants Nationality Study 1

Albanian	1	0.6%
Belgian	1	0.6%
British	2	1.2%
Bulgarian	1	0.6%
Canadian	4	2.4%
Chinese (PR)	4	2.4%
Czech	1	0.6%
Danish	2	1.2%
Dutch	9	5.4%
Filipino	1	0.6%
Finnish	2	1.2%
French	15	9.0%
German	52	31.3%
Guatemalan	1	0.6%
Chinese (HK)	1	0.6%
Hungarian	1	0.6%
Indian	3	1.8%
Indonesian	1	0.6%
Israeli	2	1.2%
Italian	1	0.6%
Moldavian	1	0.6%
New Zealand	1	0.6%
Norwegian	3	1.8%
Polish	1	0.6%
Portuguese	1	0.6%
Slovakian	1	0.6%
South African	1	0.6%
South Korean	1	0.6%
Spanish	2	1.2%
Swedish	40	24.1%
Swiss	1	0.6%
US American	7	4.2%
Zimbabwean	1	0.6%

TableB2: Participants Nationality Study 2

Australian	3.4%	3
Austrian	1.1%	1
Bangladeshi	1.1%	1
British	19.1%	17
Canadian	1.1%	1
Chilean	1.1%	1
Danish	1.1%	1
Estonian	2.3%	2
Filipino	1.1%	1
Finnish	1.1%	1
French	2.3%	2
German	4.5%	4
Greek	7.9%	7
Indian	2.3%	2
Indonesian	2.3%	2
Israeli	1.1%	1
Italian	4.5%	4
Japanese	1.1%	1
Mexican	7.9%	7
New Zealand	2.3%	2
North Macedonian	1.1%	1
Polish	16.9%	15
Portuguese	2.3%	2
Romanian	1.1%	1
Singaporean	1.1%	1
South African	2.3%	2
South Korean	1.1%	1
Spanish	1.1%	1
Swedish	2.3%	2
US American	1.1%	1
Chose not to answer	1.1%	1

7.1.3. Appendix-C Printout Study 1

Printout-version of Study 1.

Round 1 – Choosing a hotel

In the first round of the first study participants were asked to choose between different hotel options. An example of the information provided to participants is available below.

Hello,
Welcome to this study on decision-making for our master's thesis at the Stockholm School of Economics. In our study, we want to learn more about how and which decisions people make in different scenarios. Therefore, in the following you will be introduced to different scenarios in which you will be asked to make a decision.

Your help in completing this study is appreciated and should take no longer than 15 minutes. We would like to compensate you for the time and effort you put in. Participating in this survey, you get the chance to win one of two 20€ Amazon gift cards. Additionally, upon completion of the study, you will also get to choose a charity to which we will donate 0.50€.
All collected data is anonymous and will be used solely for the completion of our thesis.

If you have any questions, please reach out to:
41758@student.hhs.se.

Please read all the instructions carefully.

Many thanks,
Vendela & Simon

Imagine the following scenario: In a world where Covid-19 does not exist, you are about to make a 7-day trip to Johannesburg, South Africa. You are travelling alone, for the sake of tourism, and you have already booked your flight tickets. All that is left is choosing where you want to stay. Searching on a hotel booking website, you are presented with the options below. Scroll down, select your favorite option, and then click on the "next" button at the bottom of the page to book your hotel.

Hotel Baker



Guest reviews **8.8**

Total Price: 484€

Area (Parktown)
7 km to city center

Highlights:

- Pool
- AC
- Gym
- Wi-Fi
- Airport Transfer
- Bar
- Free Parking

Hotel Beta



Guest reviews **8.2**

Total Price: 417€

Area (Ferndale)
12 km to city center

Highlights:

- Room Service
- Wi-Fi
- Kitchen
- Pool
- Free Parking

Hotel Sugar



Guest reviews **8.3**

Total Price: 387€

Area (Melville)
3.2 km to city center

Highlights:

- Pool
- Room Service
- Terrace
- Breakfast
- Wi-Fi
- Free Parking
- AC

Hotel Gamma



Guest reviews **8.6**

Total Price: 923€

Area (Rosebank)
6 km to city center

Highlights:

- Gym
- Room Service
- Terrace
- Laundry
- Breakfast
- Restaurant
- Pool
- Bar

Hotel Cork



Guest reviews **8.8**

Total Price: 562€

Area (Sandhurst)
10 km to city center

Highlights:

- Gym
- Airport Transfer
- Pool
- Room Service
- Spa
- Free Parking
- Bar

How confident are you in the decision about the hotel you just made?

Very uncertain	Rather uncertain	Somewhat uncertain	Doubtful	Somewhat certain	Rather certain	Very certain
☐	☐	☐	☐	☐	☐	☐

I think the number of available choices of hotels was...

...far too low	...too low	...somewhat too low	...about right	...somewhat too high	...too high	...far too high
☐	☐	☐	☐	☐	☐	☐

We are interested in how you perceived the decision-making process of selecting a hotel. Please indicate, how you view the statements below

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Making the decision was enjoyable	☐	☐	☐	☐	☐	☐	☐
I just picked a random hotel because I could not decide	☐	☐	☐	☐	☐	☐	☐
I think the decision was difficult	☐	☐	☐	☐	☐	☐	☐
I recognized some of the hotel options	☐	☐	☐	☐	☐	☐	☐
I am satisfied with my decision	☐	☐	☐	☐	☐	☐	☐
We need to know whether you are actually reading these questions, click on Strongly agree	☐	☐	☐	☐	☐	☐	☐
Given more time I would probably reevaluate my choice	☐	☐	☐	☐	☐	☐	☐

How would you rate your expertise in booking hotels?

Very low	Low	Somewhat below average	Average	Somewhat above average	High	Very high
☐	☐	☐	☐	☐	☐	☐

Round 2 – Choosing a bottle of wine

In round 2 of the first study participants were asked to choose between different bottles of red wine. An example of the information that participants were provided for each bottle is provided below.

Imagine the following scenario. You are running late for a friend's birthday party and need to buy a present. Luckily you remember that your friend likes red wine. In the store you are presented with the options below to choose from. Scroll down, select the preferred option and then click on the "next" button at the bottom of the page.

○	RED WINE, FRUITY & TASTY Pietro Di Campo Barbera Silenzio, 2019 Fruity, nuanced taste with hints of dark cherries, forest raspberries, black pepper and herbs. Served at 16-18 ° C for dishes of lamb or beef, or for vegetarian dishes. 🐏 🐄 🌿 🇮🇹 Italy 750 ml FULLNESS ROUGHNESS FRUIT ACID 9.5€
○	RED WINE, SPICY & JUICY Señorío de los Llanos Gran Reserva, 2012 Spicy, ripe taste with barrel character, hints of dried fruit, nuts, oranges, tobacco and cocoa. Served at 16-18 ° C with pork or lamb dishes. 🐷 🐏 🇪🇸 Spain 750 ml FULLNESS ROUGHNESS FRUIT ACID 7.5€
○	RED WINE, SOFT & BERRY Masi Bonacosta Valpolicella, 2019 Berry taste with hints of cherries, blueberries, herbs and licorice. Served at about 16 ° C for light dishes of light meat or for fried fish, or for vegetarian dishes. 🐔 🌿 🐷 🐄 🇮🇹 Italy 750 ml FULLNESS ROUGHNESS FRUIT ACID 11€

☐



RED WINE, SOFT & BERRY

Piccini
Chianti, 2019

Berry taste with hints of cherries, raspberries, herbs and licorice. Served at about 18 °C with light meat or vegetarian dishes, preferably pasta.

 Italy - 750 ml

FULLNESS 

ROUGHNESS 

FRUIT ACID 

9€

☐



RED WINE, FRUITY & TASTY

Pech-Latt Castle
2019

Fruity, nuanced taste with hints of blackberries, violets, plums, bay leaves and blueberries. Served at 16-18 °C with lamb or beef dishes.

 France - 750 ml

FULLNESS 

ROUGHNESS 

FRUIT ACID 

13€

The decision you just made was about...

- ☐ Choosing a stock in which to invest
- ☐ Choosing a bottle of red wine
- ☐ Choosing an industry in which to start a business
- ☐ Choosing a bottle of white wine
- ☐ Choosing an ice cream flavor

How confident are you in the decision about red wine you made?

Very uncertain	Rather uncertain	Somewhat uncertain	Doubtful	Somewhat certain	Rather certain	Very certain
☐	☐	☐	☐	☐	☐	☐

I think the number of available choices of red wine was...

...far too low	...too low	...somewhat too low	...about right	...somewhat too high	...too high	...far too high
☐	☐	☐	☐	☐	☐	☐

We are interested in how you perceived the decision-making process, selecting a wine, so please indicate below

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I have experience with buying wine in a similar manner	☐	☐	☐	☐	☐	☐	☐
Given more time I would probably reevaluate my choice	☐	☐	☐	☐	☐	☐	☐
I think making the decision was enjoyable	☐	☐	☐	☐	☐	☐	☐
I just picked a random wine because I could not decide	☐	☐	☐	☐	☐	☐	☐
I think the decision was not difficult	☐	☐	☐	☐	☐	☐	☐
I am satisfied with my decision	☐	☐	☐	☐	☐	☐	☐

To evaluate your expertise in making decisions about wine, please answer the following to the best of your knowledge.

Select all grape types that are used to produce red wine.

☐ Cabernet Sauvignon

☐ Merlot

☐ Pinot Noir

☐ Riesling

☐ Semillon

☐ Syrah

What is your age?

How do you identify?

☐ Female

☐ Male

☐ Other

☐ Prefer not to say

What is your nationality?

These questions address your opinion regarding the study.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The questions were formulated clearly	☐	☐	☐	☐	☐	☐	☐
The answer options were formulated clearly	☐	☐	☐	☐	☐	☐	☐
The questions tried to persuade me in a particular direction	☐	☐	☐	☐	☐	☐	☐
The study was about decision-making	☐	☐	☐	☐	☐	☐	☐
The study was about animals	☐	☐	☐	☐	☐	☐	☐

Round 3 – Choosing a charity

Thank you for completing our study, please scroll down, select your preferred charity and click on the "next" button. We will then donate 0.50€ to them for your completed survey.

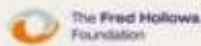
 Environment

Climeworks have developed a technology to catch CO2 directly from the air, which is then removed through storage. Out of the carbon dioxide that is collected is at least 90% buried permanently.

 Environment

They push the change in technologies and policies needed to get to a zero-emissions, high-energy planet at an affordable cost. Imagine a world where the energy needs of all humans are met efficiently without damaging the atmosphere.

Health Initiatives



The Fred Hollows Foundation is an international development organization focusing on blindness prevention in Indigenous Australian communities and around the world. They train surgeons and eye health workers, provide equipment, fund research, and support advocacy in eye health.

Health Initiatives



Supplements to prevent vitamin A deficiency.

Vitamin A deficiency leaves children vulnerable to infections and can lead to death. Helen Keller International attribute over 200,000 children's deaths to vitamin A deficiency each year. This program saves lives by providing vitamin A supplements to children under 5 years old.

☐





Other

Village Enterprise equips the extreme poor in Africa with resources to start sustainable businesses through a four-part program: entrepreneurship training, a cash grant, business mentoring, and a savings group. There is strong evidence that this leads to a significant and persistent increase in income.

How confident are you in the decision about the charity you just made?

Very uncertain	Rather uncertain	Somewhat uncertain	Doubtful	Somewhat certain	Rather certain	Very certain
☐	☐	☐	☐	☐	☐	☐

I think the number of available charities to choose from was...

...far too low	...too low	...somewhat too low	...about right	...somewhat too high	...too high	...far too high
☐	☐	☐	☐	☐	☐	☐

We are interested in how you perceived the decision-making process, so please indicate below

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I am satisfied with my decision	☐	☐	☐	☐	☐	☐	☐
I think the decision was difficult	☐	☐	☐	☐	☐	☐	☐

7.1.4. Appendix-D Printout Study 2

Printout version of Study2.

Hello,

Welcome to this study on decision-making for our master's thesis at the Stockholm School of Economics. In our study, we want to learn more about how and which decisions people make in different scenarios. Therefore, in the following you will be introduced to different scenarios in which you will be asked to make a decision.

All collected data is anonymous and will be used solely for the completion of our thesis.

If you have any questions, please reach out to: 41758@student.hhs.se.

Please read all the instructions carefully.

**Many thanks,
Vendela & Simon**

The following three pictures explain how to navigate through this study. Please make sure you understand how to navigate through the study before you click on the next button.



Once you have clicked on a hotel name, you will get on a screen with more information about the hotel.



When you think you have seen enough hotels to make your decision, go back to the Overview and click on this link

Johannesburg Hotels

[Hotel 1](#)

[Hotel 2](#)

[Hotel 3](#)

When you have made up your mind, click here to register your decision

→ [When you are ready to book click here!](#)

Imagine the following scenario: In a world where Covid-19 does not exist, you are gifting a friend of yours a 7-day trip to Johannesburg, South Africa. It is up to you to select an accommodation for your friend. Searching on a hotel booking website, you are presented with the options below. Scroll down and click on an option if you want to learn more about a hotel. When you are ready to make your decision, click on “When you are ready to book click here!”. Click on the “Overview” button to get back to this menu.

[Hotel Pi](#)

[Hotel Jig](#)

[Hotel Kilo](#)

[Hotel Yankee](#)

[Hotel Xi](#)

[When you are ready to book click here!](#)

Hotel Uniform



Guest reviews **9.3**

Total Price: 977€

Area (Craighall Park)
8 km to city center

Highlights:



Terrace



Restaurant



Gym



Bar



Room Service



Airport Transfer



Pool



Breakfast

Overview



Hotel Foxtrot



Hotel Uniform



Hotel Charlie



Hotel Kilo



Hotel You

We are interested in how you made your decision. Please distribute 100 points on the factors below, following their respective importance. If you chose not to make a decision, please put all 100 points into "I could not decide".

The hotel's name	0
The star rating	0
The guest review rating	0
The price	0
The location	0
The highlights	0
The picture of the hotel (outside)	0
The picture of the room (inside)	0
I could not decide	0
Total	0

How confident are you in the decision about the hotel you just made?

Very uncertain	Rather uncertain	Somewhat uncertain	Doubtful	Somewhat certain	Rather certain	Very certain
☐	☐	☐	☐	☐	☐	☐

I think the number of available choices of hotels was...

...far too low	...too low	...somewhat too low	...about right	...somewhat too high	...too high	...far too high
☐	☐	☐	☐	☐	☐	☐

We are interested in how you perceived the decision-making process, so please indicate below

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Making the decision was enjoyable	☐	☐	☐	☐	☐	☐	☐
I recognized some of the hotel options	☐	☐	☐	☐	☐	☐	☐
We need to know whether you are actually reading these questions, click on Strongly agree	☐	☐	☐	☐	☐	☐	☐
I am satisfied with my decision	☐	☐	☐	☐	☐	☐	☐
I think the decision was difficult	☐	☐	☐	☐	☐	☐	☐
I just picked a random hotel because I could not decide	☐	☐	☐	☐	☐	☐	☐

Given more time I would probably reevaluate my choice	☐	☐	☐	☐	☐	☐	☐
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How would you rate your expertise on booking hotels?

Very low	Low	Below average	Average	Above average	High	Very high
☐	☐	☐	☐	☐	☐	☐

These questions address your opinion regarding the study.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The questions were formulated clearly	☐	☐	☐	☐	☐	☐	☐
The answer options were formulated clearly	☐	☐	☐	☐	☐	☐	☐
The questions tried to persuade me in a particular direction	☐	☐	☐	☐	☐	☐	☐
The study was about decision-making	☐	☐	☐	☐	☐	☐	☐
The study was about animals	☐	☐	☐	☐	☐	☐	☐

Thank you for making your decisions, we would now like you to answer these basic demographical questions:

What is your age?

How do you identify?

☐ Female

☐ Male

☐ Other

☐ Prefer not to say

What is your nationality?

7.1.5. Appendix-E Control Variable Tables and Figures

Control Variable: Recognition

TableE1: T-test controlling Variable Recognition in Study1 and Study2

	DV	Don't recognize		Recognize		<i>t</i>	<i>p</i>
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Study 1	Satisfaction	5.16	0.11	5.54	0.10	-1.43	0.156
Round 1	Difficulty	4.49	0.15	4.58	0.34	-0.24	0.811
(hotel)	Confidence	4.83	0.14	4.35	0.29	1.38	0.170
	Revision	4.16	0.16	4.56	0.38	-1.00	0.319
	Enjoyment	4.34	0.14	4.08	0.31	0.78	0.437
Study 2	Satisfaction	5.44	0.15	6.00	0.22	-1.84	0.069
(hotel)	Difficulty	4.04	0.19	4.00	0.31	0.11	0.913
	Confidence	5.10	0.18	5.74	0.21	-1.77	0.080
	Revision	3.70	0.19	3.63	0.34	0.17	0.867
	Enjoyment	4.73	0.18	5.32	0.32	-1.54	0.126

Control Variable: Number of options too low/too high

TableE2: MMR results of IVs on control variable Number of options too low or too high, Study1 round1 (hotel)

	PDM				ADM				ADM-high			
	β	SE	95% CI		β	SE	95% CI		β	SE	95% CI	
			LL	UL			LL	UL			LL	UL
C	3.13	0.28	2.56	3.69	2.85	0.23	2.39	3.31	3.6	0.30	2.99	4.21
10	1.14**	0.41	0.33	1.95	1.06**	0.34	0.39	1.74	0.9*	0.41	0.08	1.72
25	2.34***	0.42	1.49	3.18	2.31***	0.32	1.66	2.96	2.22***	0.38	1.46	2.99
50	2.88***	0.41	2.06	3.69	3.65***	0.32	3.02	4.29	3.11***	0.40	2.32	3.01

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TableE3: MMR results of IVs on control variable Number of options too low or too high, Study1 round2 (red wine)

	PDM				ADM			
	β	SE	95% CI		β	SE	95% CI	
			LL	UL			LL	UL
C	3.43	0.21	3.00	3.85	3.22	0.24	2.75	3.69
10	0.94**	0.31	0.32	1.55	0.91**	0.34	0.25	1.58
25	2.07***	0.31	1.45	2.70	1.96***	0.36	1.23	2.68
50	2.92***	0.29	2.33	3.51	2.98***	0.35	2.29	3.67

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TableE4: MMR results of IVs on control variable Number of options too low or too high, Study1 round3 (charity)

	PDM			
	β	SE	95% CI	
			LL	UL
C	3.58	0.15	3.29	3.87
10	0.79***	0.21	0.38	1.21
25	2.31***	0.21	1.89	2.73
50	2.84***	0.21	2.43	3.25

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TableE5: MMR results of IVs on control variable Number of options too low or too high, Study2 (hotel)

	PDM				ADM			
	β	SE	95% CI		β	SE	95% CI	
			LL	UL			LL	UL
C	3.77	0.22	3.32	4.22	3.38	0.17	3.03	3.72
50	2***	0.31	1.36	2.63	2.24***	0.25	1.74	2.75

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Control variable: Expertise

TableE6: MMR results, controlling for expertise in wine, Study1 round2 (red wine)

	PDM				ADM			
	β	SE	95% CI		β	SE	95% CI	
			LL	UL			LL	UL
Constant Satisfaction	5.47	0.33	4.82	6.12	5.18	0.28	4.61	5.75
Expertise Satisfaction	0.32	0.30	-0.29	0.92	0.35	0.26	-0.16	0.86
Constant Difficulty	3.37	0.46	2.45	4.29	3.48	0.43	2.63	4.33
Expertise difficulty	-0.28	0.43	-1.13	0.58	0.57	0.38	-1.34	0.20
Constant Confidence	5.26	0.44	4.38	6.14	4.71	0.44	3.83	5.59
Expertise confidence	0.15	0.41	-0.66	0.97	0.05	0.40	-0.75	0.85
Constant Revision	3.16	0.44	2.28	4.04	3.30	0.40	2.51	4.09
Expertise revision	-0.34	0.41	-1.15	0.48	-0.57	0.36	-1.28	0.15
Constant Enjoyment	5.37	0.39	4.59	6.16	4.83	0.39	4.06	5.60
Expertise enjoyment	-0.28	0.37	-1.01	0.44	-0.16	0.35	-0.85	0.54

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Control Variable: Random option

TableE7: Percentage of participants self-reportedly choosing a random option, Study1 round1 (hotel)

	PDM			ADM			ADM-high		
	Freq	%	Cum	Freq	%	Cum	Freq	%	Cum
1	20	33.90	33.90	7	13.46	13.46	23	42.59	42.59
2	22	37.29	71.19	26	50.00	63.46	14	25.93	68.52
3	5	8.47	79.66	8	15.38	78.85	3	5.56	74.07
4	1	1.69	81.36	4	7.69	86.54	5	9.26	83.33
5	9	15.25	96.61	2	3.85	90.38	7	12.96	96.30
6	2	3.39	100.0	5	9.62	100.0	2	3.70	100.0
7	0			0			0		
Total	59	100.0		52	100.0		54	100.0	

Note: Measured on a 7-point Likert-scale where 1= Strongly Disagree, and 7=Strongly Agree.

TableE8: Percentage of participants self-reportedly choosing a random option, Study1 round2 (red wine)

	PDM			ADM		
	Freq	%	Cum	Freq	%	Cum
1	28	34.15	34.15	21	25.30	25.30
2	24	29.27	63.41	27	32.53	57.83
3	10	12.20	75.61	11	13.25	71.08
4	4	4.88	80.49	3	3.61	74.70
5	8	9.76	90.24	9	10.84	85.54
6	5	6.10	96.34	8	9.64	95.18
7	3	3.66	100.0	4	4.82	100.0
Total	82	100.0		83	100.0	

Note: Measured on a 7-point Likert-scale where 1= Strongly Disagree, and 7=Strongly Agree.

TableE9: Percentage of participants self-reportedly choosing a random option, Study2 (hotel)

	PDM			ADM		
	Freq	%	Cum	Freq	%	Cum
1	24	54.55	54.55	24	53.33	53.33
2	15	34.09	88.64	16	35.56	88.89
3	2	4.55	93.18	2	4.44	93.33
4	3	6.82	100.00	1	2.22	95.56
5	0			1	2.22	97.78
6	0			1	2.22	100.00
7	0			0		
Total	44	100.00		45	100.0	

Note: Measured on a 7-point Likert-scale where 1= Strongly Disagree, and 7=Strongly Agree.

Control Variable: Time spent evaluating options

TableE10: MMR results for time impacting the DVs, Study1 round1 (hotel)

		5				10				25				50			
		β	SE	95% CI		β	SE	95% CI		β	SE	95% CI		β	SE	95% CI	
				LL	UL			LL	UL			LL	UL			LL	UL
Satisfaction	C	5.45	0.16	5.12	5.78	5.77	0.16	5.3	6.09	5.13	0.22	4.68	5.57	5.156	0.25	4.64	5.67
	1	-0.45	0.31	-1.07	0.18	0.64	0.45	-0.29	1.56	-0.85	0.436	-1.73	0.27	-1.25*	0.50	-2.26	-0.23
Difficulty	C	3.97	0.35	3.25	4.68	3.85	0.28	3.28	4.43	4.75	0.28	4.18	5.32	4.97	0.29	4.39	5.55
	1	-0.56	0.70	-1.41	1.30	-0.45	0.79	-2.06	1.15	0.52	0.56	-0.60	1.65	1.03	0.56	-0.11	2.17
Confidence	C	5.03	0.24	4.54	5.53	5.53	0.19	5.14	5.92	4.59	0.30	3.98	5.20	4.25	0.32	3.60	4.90
	1	0.33	0.46	-0.61	1.27	0.47	0.54	-0.62	1.56	-0.78	0.60	-1.98	0.43	-0.71	0.64	-1.99	0.58
Revision	C	3.55	0.35	-2.85	4.25	3.74	0.29	3.15	4.32	4.38	0.29	3.79	5.00	4.69	0.34	4.00	5.37
	1	-0.19	0.66	-1.52	1.15	0.27	0.81	-1.37	1.90	1.17*	0.57	0.23	2.32	0.59	0.67	-0.77	1.94
Enjoyment	C	4.62	0.26	4.10	5.14	4.97	0.23	4.50	5.44	4.19	0.27	3.65	4.73	3.66	0.31	3.02	4.29
	1	0.16	0.49	-0.98	1.01	-0.17	0.65	-1.48	1.14	-0.01	0.53	-1.08	1.07	-0.66	0.62	-1.91	0.57

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: The time interval is in minutes.

TableE11: MMR results for time impacting the DVs, Study1 round2 (red wine)

		5				10				25				50			
		β	SE	95% CI		β	SE	95% CI		β	SE	95% CI		β	SE	95% CI	
				LL	UL			LL	UL			LL	UL			LL	UL
Satisfaction	C	5.56	0.20	5.16	5.96	5.37	0.25	4.86	5.88	5.73	0.35	5.01	6.45	5.35	0.30	4.75	5.95
	1	-0.14	0.30	-0.74	0.46	-0.28	0.34	-9.70	0.41	-0.69	0.46	-1.63	0.26	-0.05	0.38	-0.82	0.73
Difficulty	C	3.20	0.35	2.49	3.91	3.32	0.41	2.48	4.15	4.60	0.527	3.52	5.67	3.35	0.43	2.48	4.23
	1	-0.04	0.54	-1.12	1.04	0.82	0.56	-0.31	1.94	-0.31	0.69	-1.72	1.09	0.26	0.56	-0.86	1.38
Confidence	C	5.04	0.37	4.29	5.80	5.00	0.41	4.18	5.82	5.07	0.48	4.10	6.03	4.53	0.47	3.57	5.49
	1	-0.04	0.57	-1.19	1.11	-0.48	0.550	-1.59	0.63	-0.73	0.62	-2.00	0.53	0.05	0.61	-1.18	1.28
Revision	C	3.00	0.29	2.41	3.59	2.95	0.39	2.15	3.74	3.93	0.48	4.10	6.03	3.00	0.39	2.20	3.79
	1	-0.05	0.45	-0.96	0.85	0.79	0.53	-0.28	1.87	0.59	0.62	-0.68	1.86	0.42	0.51	-0.60	1.45
Enjoyment	C	5.00	0.26	4.48	5.52	5.00	0.39	4.22	5.78	4.40	0.47	3.44	5.36	4.65	0.44	3.77	5.53
	1	-0.53	0.40	-0.85	0.75	-0.65	0.52	-1.71	0.41	0.17	0.62	-1.08	1.42	-0.22	0.56	-1.35	0.91

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Note: The time interval is in minutes.

TableE12: MMR results for time impacting the DVs, Study1 round3 (charity)

		5				10				25				50			
		β	SE	95% CI		β	SE	95% CI		β	SE	95% CI		β	SE	95% CI	
				LL	UL			LL	UL			LL	UL			LL	UL
Satisfaction	C	6.13	0.12	5.88	6.36	5.68	0.16	5.35	6.00	4.96	0.21	4.54	5.39	4.83	0.30	4.23	5.44
	0.5	-0.13	0.46	-1.06	0.81	0.33	1.04	-1.77	2.42	1.04	0.49	0.04	2.03	0.04	0.66	-1.28	1.37
	1	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	-0.46	0.79	-2.08	1.15	0.92	0.88	-0.86	2.69
	1.5	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	1.04	1.10	-1.21	3.28	2.17	1.67	-1.22	5.55
	2	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	1.04	1.10	-1.21	3.28	n.A.	n.A.	n.A.	n.A.
Difficulty	C	2.93	0.25	2.42	3.43	3.65	0.28	3.09	4.21	4.67	0.40	3.85	5.48	5.80	0.24	5.31	6.29
	0.5	1.74	0.94	-0.16	3.64	2.35	1.78	-1.26	5.96	0.00	0.94	-1.91	1.91	-1.18*	0.53	-2.24	-0.11
	1	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	1.83	1.52	-1.26	4.93	-0.80	0.71	-2.23	0.63
	1.5	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	1.33	2.11	-2.97	5.64	-2.80*	1.35	-5.53	-0.07
	2	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	1.33	2.11	-2.97	5.64	n.A.	n.A.	n.A.	n.A.
Confidence	C	5.93	0.17	5.59	6.26	5.45	0.24	4.97	5.93	4.26	0.36	3.52	4.99	4.13	0.37	3.38	4.89
	0.5	-0.26	0.63	-1.53	1.01	-3.45*	1.52	-6.52	-0.38	1.41	0.85	-0.32	3.13	0.74	0.81	-0.91	2.39
	1	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	-1.26	1.37	-4.06	1.54	1.37	1.09	-0.84	3.57
	1.5	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	-0.26	1.91	-4.15	3.63	2.87	2.08	-1.34	7.07
	2	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	n.A.	2.74	1.91	-1.15	6.63	n.A.	n.A.	n.A.	n.A.

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Note: The time interval is in minutes.

TableE13: MMR results for time impacting the DVs, Study2 (hotel)

		5				50			
		β	SE	95% CI		β	SE	95% CI	
				LL	UL			LL	UL
Satisfaction	C	5.50	0.35	4.79	6.21	5.89	0.34	5.14	6.34
	3	0.23	0.49	-0.76	1.22	-0.69	0.47	-1.63	0.26
	5	-0.14	0.53	-1.20	0.93	-0.33	0.52	-1.39	0.72
	7	-0.17	0.64	-1.46	1.13	0.11	0.74	-1.38	1.61
	9	n.A.	n.A.	n.A.	n.A.	-0.89	1.16	-3.25	1.47
	11	n.A.	n.A.	n.A.	n.A.	-0.39	0.86	-2.14	1.36
	13	n.A.	n.A.	n.A.	n.A.	1.11	1.16	-1.25	3.47
	15	n.A.	n.A.	n.A.	n.A.	0.44	0.74	-1.05	1.93
Difficulty	C	4.21	0.37	3.48	4.95	4.56	0.52	3.50	5.61
	3	-1.15*	0.51	-2.17	-0.12	-0.16	0.65	-1.49	1.17
	5	-0.94	0.55	-2.06	0.17	-0.56	0.73	-2.04	0.93
	7	0.45	0.67	-0.90	1.80	0.78	1.04	-1.33	2.88
	9	n.A.	n.A.	n.A.	n.A.	-1.56	1.54	-4.88	1.77
	11	n.A.	n.A.	n.A.	n.A.	-0.56	1.21	-3.02	1.91
	13	n.A.	n.A.	n.A.	n.A.	0.44	1.64	-2.88	3.77
	15	n.A.	n.A.	n.A.	n.A.	0.44	1.04	-1.67	2.54
Confidence	C	5.14	0.37	4.40	5.89	5.33	0.51	4.31	6.36
	3	0.19	0.51	-0.85	1.23	-0.47	0.64	-1.77	0.83
	5	0.40	0.56	-0.72	1.53	0.11	0.72	-1.34	1.56
	7	0.02	0.68	-1.34	1.39	-1.33	1.01	-3.39	0.72
	9	n.A.	n.A.	n.A.	n.A.	-0.33	1.60	-3.58	2.91
	11	n.A.	n.A.	n.A.	n.A.	-0.33	1.19	-2.74	2.08
	13	n.A.	n.A.	n.A.	n.A.	0.67	1.60	-2.58	3.91
	15	n.A.	n.A.	n.A.	n.A.	1.00	1.01	-1.05	3.05
Revision	C	3.43	0.43	2.55	4.31	3.44	0.51	2.42	4.47
	3	-0.43	0.60	-1.65	0.79	1.09	0.64	-0.21	2.39
	5	0.03	0.65	-1.30	1.35	0.56	0.71	-0.90	2.01
	7	0.74	0.79	-0.86	2.34	0.56	1.01	-1.50	2.61
	9	n.A.	n.A.	n.A.	n.A.	1.56	1.60	-1.70	4.80
	11	n.A.	n.A.	n.A.	n.A.	-0.06	1.19	-2.35	2.46
	13	n.A.	n.A.	n.A.	n.A.	0.56	1.60	-2.69	3.80
	15	n.A.	n.A.	n.A.	n.A.	-0.44	1.01	-2.50	1.61
Enjoyment	C	5.14	0.38	4.38	5.90	5.00	0.53	3.92	6.08

3	-0.34	0.52	-1.40	0.72	-0.87	0.68	-2.24	0.51
5	0.13	0.57	-1.02	1.28	-0.11	0.76	-1.65	1.42
7	-0.81	0.69	-2.20	0.58	0.67	1.07	-1.50	2.84
9	n.A.	n.A.	n.A.	n.A.	1.00	1.69	-2.43	4.43
11	n.A.	n.A.	n.A.	n.A.	-1.00	1.25	-3.54	1.54
13	n.A.	n.A.	n.A.	n.A.	1.00	1.69	-2.43	4.43
15	n.A.	n.A.	n.A.	n.A.	0.33	1.07	-1.84	2.50

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: The time interval is in minutes

7.1.6. Appendix-F Descriptive Statistics

TableF1: Summary of descriptive statistics and correlation for study variables hypothesis 7 Study2

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>
1. Number of options looked at	89	14.24	12.57	-	
2. Time spent looking at options	89	6.62	5.83	0.44	-
3. Percentage of options looked at	89	0.74	0.20	-0.28	0.03

TableF2: Summary of descriptive statistics and correlation for study variables hypothesis 8 Study2

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
1. Name	89	1.20	3.06	-						
2. Stars	89	16.63	13.73	-0.05	-					
3. Reviews	89	14.82	11.68	-0.24	0.15	-				
4. Price	89	20.61	16.75	-0.20	-0.03	0.01	-			
5. Location	89	18.60	16.62	-0.06	-0.30	-0.29	-0.23	-		
6. Highlights	89	8.57	11.03	0.13	-0.12	-0.14	-0.34	-0.18	-	
7. Picture1	89	7.85	10.63	0.19	-0.35	-0.23	-0.34	-0.08	0.03	-
8. Picture2	89	20.61	16.75	0.12	-0.35	-0.31	-0.33	-0.16	0.04	0.24

7.1.7. Appendix-G Results Tables H2 - H6

TableG1: MMR results for Satisfaction Study1 round1 (hotel)

PDM		ADM low accountability								ADM high accountability					
	β^a	β^b	SE	95% CI		β^a	β^b	SE	95% CI		β^a	β^b	SE	95% CI	
				LL	UL				LL	UL				LL	UL
C	5		0.29	4.41	5.59	5.69		0.28	5.12	6.26	5.5		0.42	4.65	6.35
10	0.87*	0.87*	0.42	0.02	1.71	-0.15	-0.15	0.42	-0.99	0.7	0.5	0.5	0.57	-0.65	1.65
25	-0.77	-1.64***	0.44	-1.65	0.11	-0.08	0.07	0.40	-0.89	0.73	-0.62	-1.19*	0.53	-1.69	0.45
50	-0.13	0.64	0.42	-0.98	0.71	-0.76	-0.69	0.40	-1.56	0.03	-0.79	-0.17	0.55	-1.90	0.32

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

b = beta compared to the next smaller choice-set.

TableG2: MMR results for Satisfaction Study1 round2 (red wine)

	PDM				ADM					
	β^a	β^b	SE	95% CI		β^a	β^b	SE	95% CI	
				LL	UL				LL	UL
C	5.62		0.29	5.04	6.20	5.39		0.24	4.91	5.87
10	-0.41	-0.41	0.42	-1.25	0.43	-0.17	-0.17	0.34	-0.85	0.50
25	-0.34	0.16	0.43	-1.20	0.51	-0.10	0.08	0.37	-0.83	0.63
50	-1.40***	-1.15*	0.40	-2.21	-0.60	-0.19	-0.09	0.35	-0.89	0.51

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

b = beta compared to the next smaller choice-set.

TableG3: MMR results for Satisfaction Study1 round3 (charity)

	PDM				
	β^a	β^b	SE	95% CI	
				LL	UL
Constant	6.12		0.18	5.76	6.47
10	-0.47	-0.47	0.26	-0.98	0.05
25	-0.95***	-0.52	0.26	-1.48	-0.43
50	-1.14***	-0.19	0.25	-1.64	-0.64

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

b = beta compared to the next smaller choice-set.

TableG4: MMR results for Satisfaction Study2 (hotel)

	PDM				ADM			
	β^a	SE	95% CI		β^a	SE	95% CI	
			LL	UL			LL	UL
Constant	5.68	0.26	5.16	6.20	5.38	0.24	4.89	5.86
50	0.00	0.36	-0.74	0.74	0.15	0.36	-0.57	0.87

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

TableG5: MMR results for Difficulty Study1 round1 (hotel)

	PDM		ADM low accountability							ADM high accountability					
	β^a	β^b	SE	95% CI		β^a	β^b	SE	95% CI		β^a	β^b	SE	95% CI	
				LL	UL				LL	UL				LL	UL
C	4.56		0.42	3.73	5.40	3.31		0.44	2.42	4.20	3.5		0.51	2.47	4.53
10	-0.03	-0.03	0.60	-1.23	1.17	0.42	0.42	0.65	-0.89	1.73	-0.42	-0.42	0.70	-1.82	0.98
25	0.90	0.93	0.62	-0.35	2.15	1.46*	1.04	0.62	0.21	2.72	1.03	1.53**	0.65	-0.27	2.33
50	0.30	-0.59	0.60	-0.90	1.50	1.55*	0.09	0.61	0.32	2.78	2.5***	1.47**	0.67	1.15	3.85

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

b = beta compared to the next smaller choice-set.

TableG6: MMR results for Difficulty Study1 round2 (red wine)

	PDM			ADM						
	β^a	β^b	SE	95% CI		β^a	β^b	SE	95% CI	
				LL	UL				LL	UL
C	3.24		0.41	2.43	4.05	3.13		0.36	2.42	3.85
10	0.76	0.76	0.59	-0.41	1.94	0.43	0.43	0.51	-0.58	1.45
25	1.21*	0.26	0.60	0.02	2.40	1.46**	1.02	0.55	0.36	2.55
50	2.02***	1.00	0.56	0.90	3.14	1.12*	-0.34	0.53	0.07	2.17

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

b = beta compared to the next smaller choice-set.

TableG7: MMR results for Difficulty Study1 round3 (charity)

	PDM				
	β^a	β^b	SE	95% CI	
				LL	UL
Constant	3.05		0.26	2.53	3.56
10	0.73	0.73	0.37	-0.01	1.47
25	1.79***	1.13**	0.38	1.04	2.55
50	2.40***	0.60	0.37	1.67	3.12

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

b = beta compared to the next smaller choice-set.

TableG8: MMR results for Difficulty Study2 (hotel)

	PDM				ADM			
	β^a	SE	95% CI		β^a	SE	95% CI	
			LL	UL			LL	UL
Constant	3.41	0.32	2.77	4.05	3.92	0.30	3.31	4.52
50	0.95*	0.45	0.05	1.86	0.56	0.44	-0.33	1.45

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

TableG9: MMR results for Confidence Study1 round1 (hotel)

	PDM		ADM low accountability								ADM high accountability				
	β^a	β^b	SE	95% CI		β^a	β^b	SE	95% CI		β^a	β^b	SE	95% CI	
				LL	UL				LL	UL				LL	UL
C	4.88		0.35	4.17	5.58	5.69		0.42	4.86	6.53	5		0.51	3.97	6.03
10	0.39	0.39	0.51	-0.63	1.41	-0.24	-0.24	0.61	-1.47	1.00	1.00	1.00	0.69	-0.39	2.39
25	-1.03	-1.42*	0.53	-2.09	0.03	-0.38	-0.15	0.59	-1.57	0.80	-0.88	-1.96**	0.64	-2.17	0.41
50	-1.21*	-0.18	0.51	-2.23	-0.19	-1.26*	-0.88	0.58	-2.43	-0.10	-0.86	0.03	0.67	-2.20	0.48

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

b = beta compared to the next smaller choice-set.

TableG10: MMR results for Confidence Study1 round2 (red wine)

	PDM			ADM						
	β^a	β^b	SE	95% CI		β^a	β^b	SE	95% CI	
				LL	UL				LL	UL
C	5.33		0.39	4.55	6.12	4.74		0.37	4.00	5.47
10	-0.91	-0.91	0.57	-2.05	0.23	0.26	0.26	0.52	-0.78	1.30
25	-0.67	0.37	0.58	-1.82	0.49	-0.27	-0.53	0.57	-1.39	0.86
50	-2.33***	-1.79**	0.55	-3.42	-1.25	-0.59	-0.32	0.54	-1.67	0.49

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

b = beta compared to the next smaller choice-set.

TableG11: MMR results for Confidence Study1 round3 (charity)

	PDM				
	β^a	β^b	SE	95% CI	
				LL	UL
C	5.91		0.26	5.40	6.42
10	-0.58	-0.58	0.37	-1.32	0.15
25	-1.42***	-0.88*	0.38	-2.17	-0.67
50	-1.44***	-0.02	0.36	-2.16	-0.72

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

b = beta compared to the next smaller choice-set.

TableG12: Confidence Study2 (hotel)

	PDM				ADM			
	β^a	SE	95% CI		β^a	SE	95% CI	
			LL	UL			LL	UL
C	5.73	0.25	5.21	6.24	4.92	0.32	4.28	5.55
50	-0.27	0.36	-1.00	0.45	-0.06	0.46	-1.00	0.87

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

TableG13: MMR results for Revision Study1 round1 (hotel)

	PDM		ADM low accountability								ADM high accountability					
	β ^a	β ^b	SE	95% CI		β ^a	β ^b	SE	95% CI		β ^a	β ^b	SE	95% CI		
				LL	UL				LL	UL				LL	UL	
C	4.25		0.38	3.49	5.01	2.46		0.45	1.56	3.37	3.4		0.65	2.10	4.70	
10	-0.78	-0.78	0.55	-1.88	0.32	1.17	1.17	0.67	-0.16	2.51	0.68	0.68	0.88	-1.08	2.44	
25	1.21*	1.99***	0.57	0.07	2.35	1.46*	0.29	0.64	0.18	2.74	1.25	0.42	0.81	-0.39	2.88	
50	0.75	-0.46	0.55	-0.35	1.85	2.18***	0.72	0.63	0.92	3.44	1.46	0.21	0.85	-0.24	3.16	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

b = beta compared to the next smaller choice-set.

TableG14: MMR results for Revision Study1 round2 (red wine)

	PDM					ADM				
	β^a	β^b	SE	95% CI		β^a	β^b	SE	95% CI	
				LL	UL				LL	UL
C	3.00		0.39	2.23	3.77	2.96		0.34	2.29	3.62
10	0.32	0.32	0.56	-0.80	1.44	0.48	0.48	0.47	-0.47	1.42
25	1.72**	1.21	0.57	0.59	2.86	1.04*	0.57	0.51	0.02	2.07
50	1.83***	0.30	0.54	0.76	2.89	1.04*	0.00	0.49	0.06	2.02

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

b = beta compared to the next smaller choice-set.

TableG15: MMR results for Revision Study2 (hotel)

	PDM				ADM			
	β^a	SE	95% CI		β^a	SE	95% CI	
			LL	UL			LL	UL
C	3.41	0.32	2.76	4.06	3.38	0.33	2.71	4.04
50	0.73	0.46	-0.19	1.65	0.48	0.48	-0.49	1.46

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

TableG16: MMR results for Enjoyment Study1 round1 (hotel)

	PDM		ADM low accountability							ADM high accountability					
	β^a	β^b	SE	95% CI		β^a	β^b	SE	95% CI		β^a	β^b	SE	95% CI	
				LL	UL				LL	UL				LL	UL
C	4.81		0.39	4.03	5.60	4.54		0.44	3.65	5.43	4.60		0.47	3.66	5.54
10	0.19	0.19	0.56	-0.94	1.31	0.28	0.28	0.65	-1.03	1.59	0.40	0.40	0.63	-0.87	1.67
25	-1.04	-1.23	0.58	-2.21	0.13	0.00	-0.28	0.63	-1.26	1.26	-0.36	-0.76	0.59	-1.55	0.82
50	-1.28 *	-0.24	0.56	-2.41	-0.15	-1.11	-1.11	0.61	-2.35	0.13	-1.10	-0.74	0.61	-2.33	0.13

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

b = beta compared to the next smaller choice-set.

TableG17: MMR results for Enjoyment Study1 round2 (red wine)

	PDM				ADM					
	β^a	β^b	SE	95% CI		β^a	β^b	SE	95% CI	
				LL	UL				LL	UL
C	5.24		0.35	4.54	5.94	4.74		0.32	4.10	5.38
10	-0.92	-0.92	0.51	-1.93	0.09	0.17	0.17	0.45	-0.73	1.08
25	-0.68	0.37	0.52	-1.71	0.34	-0.45	-0.62	0.49	-1.42	0.53
50	-2.76 ***	-2.21 ***	0.48	-3.72	-1.80	-0.94*	-0.49	0.47	-1.88	0.00

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.

b = beta compared to the next smaller choice-set.

TableG18: MMR results for Enjoyment Study2 (hotel)

	PDM				ADM			
	β^a	SE	CI of 95%		β^a	SE	CI of 95%	
			LL	UL			LL	UL
C	5.09	0.31	4.46	5.73	4.83	0.31	4.21	5.46
50	-0.18	0.45	-1.08	0.72	-0.26	0.45	-1.17	0.65

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a = beta compared to the smallest choice-set = 5.