FACULTY OF ECONOMICS AND BUSINESS

Who do you listen the most?

The impact of naïve and expert advice on decision-making

MASTER OF BUSINESS ECONOMICS

ECE KAMACI
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Thesis submitted to obtain the degree of

Major International Business, Strategy and Innovation

Promoter: Prof. Dr. Bart Leten
Tutor: Mathias Boënne

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While making decisions, people may require assistance if they feel they are not knowledgeable enough. In this case, they may seek for advice, and it can help them to make better decisions. After the previous research on advice and its concepts are reviewed, the advice types naïve and expert advice are tested on their impact on decision-making. By using a method to make participants estimate the prices of real estates with the assistance of such advice, I observed that advice from professionals are more preferred in decision-making if a single type of advice is received. If advice from experienced and inexperienced sources are given at the same time, naïve advice is more likely to be utilized compared to an expert's recommendation. When participants encountered huge differences between their opinions and advice, they utilized the advice without criticizing its accuracy, increasing the quality of decision-making.

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[1] This document might contain (parts of) texts from earlier submitted documents within the same educational programme, related to the Master's Thesis process of the same author as the author of this work.

General Introduction

Whether it is for what to eat for breakfast or which economic policy to implement in order to not cause a financial crisis, decision-making is an integral part of human behavior. In fact, every individual in the universe have to make decisions in order to survive. These decisions can be very simple or very complex; depending on the context, the environment, and the people involved in it. No matter how complicated they are, deciding on something is not always easy. Sometimes, an environmental disturbance will open the way for another decision. Sometimes, an emergency situation will occur, forcing individuals to make efficient decisions fast. Sometimes, we will just refuse to make decisions because we do not feel like doing it. Despite the barriers that could occur during our decision-making process, we and everyone else have to reach to a solid outcome in some time. However, we are lucky, because if we do not feel like making decisions or we are having a hard time to decide on things, we can use help to guide us. Besides, we do not have to be in a mentally challenging situation to seek guidance from other sources, as we can simply ask for help to make better decisions, thus making better choices in life. In that case, advice comes in, to guide us, counsel us, and assist us to make better decisions.

Advice is a concept that comes in many shapes and sizes. First, it can be a verb used as “to advise” something to someone. Second, it can be a noun used as to “give an advice” to someone. Although there are two different forms that appear to be present, they are not vastly different. After all, their intention is the same: to help us make better decisions. If it helps in this matter, every piece of guidance and support can be considered as advice. The distinction may seem like easy, but things get complicated when the concept of advice is taken to the dissection table of researchers, who tries to understand what advice is and how it actually works. In this thesis, I will make my own introduction to understand this concept of advice, alongside with the other scholars who have been working on this topic.

To begin with the process of understanding what advice is and how it works, I will firstly examine what was previously researched on this concept. I will report my findings in the literature review, and it will form an expedient foundation of this thesis. Prior to my previous description of advice as a verb and a noun, it has been appeared that advice is actually more complex than a simple definition, even so that there is no unified acceptance of what advice actually is. In addition to its definition, it will turn out that advice will shapeshift into many forms depending on the field of studies, and there are many of them. Taking advice to improve decision-making is something that is researched on many subjects, from psychology to economics, or in any field that require advice to improve judgements and their accuracy. However, all these scholars are working on one thing in general: to understand advice.

Further in the literature review, I will inspect the architecture of advice. No matter what consists in advice, it is exchanged through two parties: one that gives advice and one that receives advice. I will then explore the existing studies that uses this advice giving-taking relationship to understand how advice creates an impact on who gives or who receives. In theory, people will ask for advice to use it in order to make better decisions. In reality, however, advice will not be used by its receivers by its full potential. Instead, the likelihood that an advice will be listened and used in decision-making by its receivers are tied to many concepts and formulations. When advice takers perceive and advice to be incorrect, they will not listen. When advice takers perceive an advice giver (i.e. advisor) to be underwhelmingly inaccurate, they will not listen to them or their advice. If the advice is at the opposite direction of the advice taker, they will decide not to use it to make decisions. Ultimately, the personal characteristics of advice exchangers will be, as a matter of fact, important to what extent advice will be used to make decisions. Throughout the literature review, I will analyze these findings and try to understand how advice actually works.

At the end of the literature review, I will address to the previous studies' weaknesses and limitations. The research on advice is very comprehensive, however, it is in need of revision and re-examination. Yes, the main findings might be still relevant today, but it might also be possible that some new factors can be entered into the research process. For instance, because of their simplicity, decisions based on quantitative subjects are preferred in advice research. However, not all decisions that people make are quantitative. In fact, some decisions are such complex that their process cannot be examined through analyzing severely quantitative opinions. Furthermore, one weakness in studies concerning advice is that they assume the advice giver as to be more superior than the advice taker. However, in reality, people can receive advice from people who are similar or even inferior to them in terms of knowledge and experience.

The research topic of this thesis is stemming from the weaknesses and limitations of previous studies. I will try to explore the phenomenon of whose advice matters more in decision-making: the professionals or the regulars. I will work to find out to what extent their advice is listened by its receivers, and how the advisors are perceived as being sufficient or insufficient. Finally, I will measure the change in decision-making quality before and after the reception of advice. To test these, I will introduce a real-life simulation of ordinary complex decision-making. For this, I have chosen to design a price guessing simulation in the form of an online experiment. I have rendered this experiment design to incorporate the respondents into a stressful real-life situation, as I am trying to assess complex levels of decision-making into the simulation. In addition, I am measuring how advice will help these respondents in a case where they are inexperienced and uninformed, and the need for help is more than desirable.

In the following chapters, I will explain my hypothesis and methodology in detail, and share the results that I have acquired from the experiment. After reviewing the results and testing the hypotheses, I will analyze and interpret the findings and compare them to the previous findings that I have discussed in the literature review. Furthermore, I will demonstrate the practical implications that can be taken out from the results of my experiment and its results. Last but not least, I will conclude this thesis by discussing the main and most important findings, alongside with what I have added to this field of understanding and reviewing advice. Finally, I will discuss the limitations and weaknesses that have emerged during the construction of this research, and how they could be researched in a better way in further research.

Overall, I tried to illustrate that advice is not a subject that should be taken lightly. In our lives, we use advice so much that we often do not realize its importance. However, with the studies researching advice, and from the resolution of this thesis, we should be aware of that the impacts of giving and receiving advice are more prominent than we have initially guessed it to be. By handling advice with more care and respect, we have the power to make better decisions and make better quality judgements, improving our perception of living.

1 Literature Review

In this literature review, the research area that is considered as “advice literature” will be reviewed, their results will be discussed and their relevance in regards to this area will be evaluated. With the term advice literature, I will analyze the papers that unravel the human behavior and decision processes while giving advice, taking advice and making decisions. In general, advice literature inspects two actors that are included in advice exchange: the ones that give advice (i.e. advisors) and the ones that take advice (i.e. judges). To be more specific, Bonnacio and Dalal (2006) define judges as the ones who will make the final decision and the advisors as the sources of advice, hence advisors are not decision-makers. If a paper has identified judges and advisors in this particular way and the study investigates the relationship between the two actors, it can be defined as the part of the advice literature. I will also include judge-advisor systems (JAS) in this literature, as reviewing them separately may complicate things in this study Now that a general understanding of what can be used as a piece of advice literature has been established, the concept of advice can be further analyzed.

First of all, the concept of advice is not included in textbooks as a theory or concept, compared to decision-making and human behavior subjects already and continued to being researched upon in psychology and organizational sciences. This may be explained with the fact that the research on advice is relatively new (i.e. started in 1980s), and theories about advice giving and taking is mostly non-existent because of their broad scope in application and research (Bonaccio & Dalal, 2006). As a result, the most sufficient findings on advice literature can be only found on scientific articles, and instead of theories, these are outputs of studies and experiments. The less sufficient articles about advice are informally structured and usually bear the title “an advice for X” or “how to give advice to X”, mainly written for managers and published in vulgarizing business magazines such as Business Insider, which will not be used for this literature review since they do not have satisfactory content to structure this research.

Fortunately, advice and its influence in decision-making is researched in many scientific communities, such as organizational sciences (e.g. studies of Yaniv), social psychology (e.g. Dana & Cain, 2015), neuroscience (e.g. Staudinger & Büchel, 2013), forecasting (e.g. Harvey & Fischer, 1997), and economics (e.g. Schotter, 2003). Most significantly, the articles published in the Journal of Organizational Behavior and Human Decision Processes are the most inclusive papers in terms of advice literature. These articles will be widely used in this literature review, since most articles related to our subject the most are mostly published there. By all means, in order not to bias this review on one journal, other articles from other journals will be included, since it is researched in more fields other than organizational sciences as previously mentioned. It can be assumed that studying the advice literature in assorted perspectives will help to increase credibility and validity of the results.

Even though different scientific communities have been researching on advice literature, the topics that they are doing research on are interrelated and often complimentary in one way or another. In fact, Yaniv (2004b) indicates that the quality of the research done on advice literature is related its way of production, which is similar in various fields. As a result, scholars often cite each other in their papers regardless of the profession of other scholars and their research areas. This illustrates that findings of advice literature can be replicated and further branches of advice literature can be created and modified by using the previous results provided by various scholars. As a result, this study will combine the findings of various scholars working in different fields, analyzing their perspectives of how and which ways they approach to advice literature.

After identifying the various perspectives of advice literature, I will inspect the related literature in this paper, by characterizing them according to which topic they are mainly focused on. Firstly, I will start with how scholars define and deal with the advice process; in which they define how advice is exchanged, which parties are involved, and which external factors they include to manipulate the ordinary process. Secondly, the review will focus on these manipulated external factors, starting with the types, quality, quantity, and the intended use of advice. Thirdly, the treatment of advice by the decision-makers will be analyzed, by using the phenomenon of advice discounting. Lastly, the relationship between the people in the advice process (i.e. judges and advisors), and which factors may affect their advice exchange will be inspected. Before concluding this review, the blank spots in advice literature will be discussed, shaping the design of this study.

1.1 Defining Advice

The Oxford Advanced Learner's Dictionary defines advice as “an opinion or a suggestion about what someone should do in a particular situation”. While this definition can define the advice process, it does that from a very simple level. Advice, in fact, has various components that changes its variety, such as its source and structure, which are absent from this definition. Typically, most studies in advice literature assume a two-level hierarchy. In this way, advice givers are assumed to be much superior than advice takers. While exchanging advice, advice takers are assumed to receive the advice without influencing the advice givers. Some of the studies assume a flat hierarchy between the advice givers and takers, while fewer studies assume advice givers being inferior to advice takers. In addition, advice can be constructed as both formally and informally. Most studies assume advice exchange as a formal process, which is purely used for decision-making. Discussed less in advice literature, informal advice can lead to changes in decision-making as much as formal advice does. More of how these different types of advice works will be discussed in Section 2.

In the academical level, this simple definition of advice is often not applicable and can confuse the readers about how advice will be treated. This problem is realized by Bonaccio and Dalal (2006), who recommends that dictionary definitions of advice should not be adapted in theoretical and empirical studies. Nevertheless, they state that the definition of advice is underutilized in most of the studies in advice literature. Unfortunately, most studies fact-check this statement, as they jump from how advice simply works for individuals to make decisions, to the main driver or manipulator of the study. By this way, without a clear definition of advice, irregularities may appear in methodologies and experiments, such as the ignorance of factors that may directly affect the results, and the crafting of advice that may be inadequate to be considered as an advice by the decision-makers. Along with the definition of this problem, Bonaccio and Dalal (2006) offers a solution, in which they suggest that advice process has a “higher-order model”. In this model, the concept of advice is branched by lower-level actions that can be done: positive reactions, negative reactions and guidance on how to react. Perception of advice enters into the field in this case, in which the advice givers should make an assumption on how to treat advice in terms of its characteristics. Nonetheless, it should be known that advice is not one dimensional, as its source and structure, being formal or informal, will change depending on why it is received.

1.2 Advice Processes and Concepts

In terms of understanding how advice exchange happens in between parties, experiments are used by many scholars. In these experiments, also named "judge-advisor system (JAS)" in the advice literature, there usually are two parties: one who receiving the advice is called judge and one giving the advice is called advisor. Parties can communicate by face-to-face, or electronically in recent studies. For most experiments in JAS studies, the advisor role is replaced by computers (i.e. Yaniv's studies). However, this non-human advisor role is created and manipulated by humans, in these cases by the scholars. In the experiments, participants (i.e. judges) are presented with questions (i.e. decisions), and they have options to take advice either from humans or computers, before submitting an answer (i.e. making a decision). In that environment, scholars are able to manipulate certain factors depending on what they are testing. JAS studies can be altered in multiple ways in order to receive more accurate results, however, the nature of the judge-advisor relationship stays similar in these experiments. Additionally, this is one of the most frequent used methods in order to define and test the concepts of advice.

1.2.1 Advice Types

In the first step, the sources of an advice can make a difference in decision-making. Cumbersomely for advice literature, there is no shared approach to classify them, but I will focus on naïve advice and expert advice in this section. To begin with an example, Jungermann (1999) has constructed a model that explores a consultant-client relationship, and concludes that if consultants are considered as very trustworthy, their advice will be valued by the clients. This, in fact, shows that expert advice is very credible for judges, no matter how credible is the advice. Additionally, experts are highly confident in their work and the advice they are giving (Blunden et al., 2018), so this may be a reason why expert advice is liked to be followed by the judges.

Additional two articles coming from the neuroscience field explains the effects of expert advice on decision-making. Expert advice is, as defined by Meshi et al. (2012), is the advice that are given to judges by experts in a given subject. They indicate that it is different from novice advice, as novice advice comes from the advisors that are less qualified. Nevertheless, the relationship between the judges and advisors are still formal, the only thing differing in this study is the assumed amount of knowledge the advisors have, from the perspective of judges. The other article, by Staudinger and Büchel (2013), does not define expert advice, but instead they shift their attention to experts giving misleading advice in a given context. In other words, Meshi et al. (2012) directs their study on novice and expert advice, while Staudinger and Büchel (2013) investigates the consequences of misleading advice.

Although these two studies use different methods as experiments, their results are similar. Meshi et al. (2012) comes to a conclusion that expert advice is trusted more than novice advice by judges. In addition, judges would compare the advice with their initial opinion first, before making a decision. This, explained by Meshi et al. (2012) is influenced by primacy effect as studied in psychology. In a different fashion, Staudinger and Büchel (2013) finds out that if judges received misleading advice first, they would stick to that advice. After this process is complete, judges' beliefs are harder to change when other advice are presented to them. From their neuroscientific section of these studies, they discovered that while respondents were evaluating advices, the section of their brain controlling rewards was active. Hence, judges' behaviors can be explained by one additional way: the brain evaluates advices as inputs that can be converted to rewards, and tries to obey the best input (or advice) that may lead to the best rewards, even though it will not lead to a real reward in real life.

Expert and novice advice assume there is a hierarchical structure between the judges and advisors. The only difference is the amount of power distance in between them, as expert advice assumes there is more power distance between the judge and the advisor compared to novice advice. On the other hand, a noteworthy study illustrates a different type of advice, without presenting any formal power distance, in which it was not explored in detail by other scholars. In his review, Schotter (2003) studies "naïve advice", defining it as the advice given by the judges' social surroundings, such as their friends or family. Additionally, he also confirms that naïve advice is exchanged through word-of-mouth instead of traditional advice exchange models discussed in this review. In this study, it can be seen that naïve advice is different from expert and novice advice as tackled by Meshi et al. (2012). Throughout his study, Schotter (2003) uses game theory and economical modelling to disclose the effects of naïve advice, and observes that advice is followed directly, led to a behavioral change in judges, and promoted learning in their respondents. Subsequently, it can be seen that even naïve advice has a positive effect on judges as it helps them to make more accurate decisions, and the rest of these findings align with previous experiments done in the advice literature. Unfortunately, naïve advice in business environments lacks research, but I believe it requires more attention, as there might be some cases that executives may ask their lower-level colleagues for an advice.

Another concept that is as important as where it came from is the judges' behavior upon receiving advice, leading to decision-making. These can be defined as decision accuracy, which are the outputs of final decision processes (Bonaccio & Dalal, 2006). In other words, it is the decision that has been made, after judges have reviewed the advice, either discounted or utilized. It can be expected that receiving advice should increase decision accuracy, indeed there should be a reason why judges seek out advisors for any reason. In fact, this is what actually happens, according to Yaniv (2004b). However, decision accuracy will not be increased in equal amounts when an advice is received by a judge. It will be affected by different factors, in which I will focus on is the quality and quantity of the advice.

1.2.2 Advice Quality

In terms of quality, Yaniv and Kleinberger (2000) makes a distinction between advice as poor quality and good quality, and their results present that when perceived by judges, a poor-quality advice will be discounted more, compared to a good-quality advice. However, there is a problem defining the quality of the advice: It is not always objective, as shown in Yaniv and Kleinberger (2000)'s experiment. Eventually, judges' weight and review the advice by comparing it to their own opinions, so the "good quality" advice is closer to their own opinion, while "poor quality" advice is distant from their opinion. To demonstrate an example, Harvey and Fisher (1997) shows that judges have an initial opinion in their mind, and by receiving advice, they “shift” their opinion by changing it the direction of the advice received. This shows that while making a decision, judges will make complex cognitive processes while reviewing advice, not only categorizing as being good and bad. It might also differ in business environments, in which decisions are more complex, as decision-making is a process (Garvin & Roberto, 2001) instead of a static event in which a final decision is made without any process.

To understand how would advice influence decision-making in more complex tasks, the study of Gino and Moore (2007) would be a peculiar step. Their experiments have shown that people were not weighting advice uniformly, instead, they would be more dependent on advice for the tasks that are more difficult and less dependent on advice for the tasks that are easier. In fact, this may be the reason that why people use the advice that they have received in the first place, and how high-level managers would be in a vulnerable position while trying to make crucial decisions. Unfortunately, the lack of studies fails to demonstrate how this behavior would differ in a complex business-level decision-making process.

1.2.3 Advice Quantity

Another prominent topic that the advice researches have investigated is the quantity of advice the advisors are receiving. In general, the findings result in that multiple uses of advice have increased decision accuracy (Yaniv, 2004a; Yaniv & Milyavsky, 2007). However, the judges process advice differently in this case, compared to reviewing only a single piece of advice. Yaniv (2004a) has suggested that there were still traces of egocentrism in judges’ behavior on using advice, as they were putting more attention to the advice that are the closest to their own opinion and equally judge the other pieces of advice that are further from their own opinion. In addition, after that reviewing process, the increase in decision accuracy was not optimal enough. In other words, receiving multiple pieces of advice only helped a little in increasing decision accuracy. Similarly, Yaniv and Milyavsky (2007) has replicated these findings, uncovering that judges were self-centered while weighting advices, and the influence them in decision-making was again not optimal enough.

A different and recent perspective emerges from Blunden et al. (2018). In their study, they remark that they address the “interpersonal consequences” of advice exchange, and they turn their attention to advisors instead of judges. Blunden et al. (2018) expresses that if advisors realize the judges are using other advisors’ help and not applying their advice in decision-making, they tend to punish these judges, even considering to sever their relationship with them. These results illustrate that using multiple advices in order to increase decision accuracy might not always be the best choice for judges, as it has a consequence of backfire from the advisors, resulting them distancing themselves from their position as advice givers.

1.2.4 Intended Use of Advice

In addition to make more accurate decisions both for individual and corporate gain, advice can be also used for reducing uncertainty. As an example, Willy (2010)’s review shows how seeking expert opinions may go wrong in forecasting, by demonstrating one of the key findings of advice literature: judges discount advice. To solve this, in addition with the aim of managing uncertainty in operable levels, he offers a new method that advisors can use, called the Cook's method. In this method, decision-makers use a performance-weighted solution instead of an equal-weighted solution, by asking advisors to self-review their opinions by how uncertain they could get. Later, the opinions are pooled, and are found by Willow (2010) as resulting in "rational consensus" by decreasing the impact risky, highly uncertain opinions of overconfident advisors and increasing the positive impact of carefully thought, less uncertain opinions of cautious advisors, therefore reducing uncertainty in great levels in the end.

Next in uncertainty reduction, Yaniv (1997) demonstrates that judges can weight and then trim opinions to increase decision accuracy in uncertain environments, however, its extent is prone to decrease given the distribution of data that has been used. Additionally, he proves evidence to "advice shifting", as presented in Harvey and Fischer (1997): when in risky situations, judges tend to change their opinions, not completely but for a certain amount, which is demonstrated by approximately 20% by these scholars. In general, expert advice is being sought by judges to reduce uncertainty in forecasts, however, its effects are less significant than expected.

1.3 Discounting of Advice

While the qualitative aspects of advice can have immediate effect to the decision-making process, judges continue to review advice upon receiving it. As such, even without any modifications in crafting and sending, advice will be perceived differently, affecting the extent in which it will be used or not. This can be distinguished as advice utilization and advice discounting, the former defined as the acceptance of advice and the latter being the rejection of advice (Bonaccio & Dalal, 2006). The experiments of Yaniv gets the most attention in this area. In one of the compelling studies, Yaniv and Kleinberger (2000) discusses that judges are tend to discount advice and prioritize their own opinions, as judges develop an egocentric bias against their advisors. These results on advice discounting are replicated in Yaniv's further studies. In a later experiment, Yaniv (2004a) added alongside to his previous findings that judges who have higher knowledge discounted advice more, and judges discounted the advice more if they are further away from their initial opinion. Moreover, in addition to egocentrism, he includes self-serving bias as the cause of this phenomenon. In a similar study differing by adding social elements unlike the other previous experiments, Yaniv et al. (2011) illustrate that judges would less discount an advisor with an opinion similar to them, adding advisor similarity and social influence to the causes. Finally, according to Yaniv and Milyavsky (2007), if there are multiple advisors that judges can listen, they will mostly discount the advice that are further away from their initial opinion, equally weighting the rest of the advisors. Augmenting with the previous studies, they add self-serving bias as a cause of advice discounting.

Even though the articles of Yaniv present exquisite findings for advice literature, they have a common problem. Nearly all of the experiments Yaniv and his colleagues are conducted are one-dimensional. The sample is consisted of undergraduate students, which makes it easier to apply the findings to individual decision-making, but making it harder to apply them to corporate decision-making, especially in high-level managerial contexts. Apart from this, team decision-making is not deeply experimented by Yaniv. However, the biggest problem about his experiments are that they are always conducted in front of a computer.

The advisor in Yaniv's experiments are not present as a person, but as a program in the computer software. There is evidence that decision accuracy in computer-mediated environments and face-to-face environments will differ (Hedlund et al., 1998), meaning there might be a change judges' behavior if face-to-face advice is used. Furthermore, because of this system's limitations, these "advisors" can only give a solid opinion, not creating a discussion environment similar to business environments (see Ljungkvist & Andersén, 2016 for an example). Additionally, in the lab environment in Yaniv's experiments, the respondents have to make an estimate for a fact, such as a date or time. This further puts some limitations for Yaniv's findings to be applied to a corporate environment where there are multiple advisors with different opinions, with no clear-cut from each of these. The only paper that differs from this format is from Yaniv et al. (2011), which the respondents rate songs by the influence of different opinions, and still a computer is used. Although Yaniv's experiments are conducted with limitations, these results are still can be applied to individual behavior and used as decision-making tools. By acknowledging these factors, this review can be taken further.

1.4 Relationship between Advisors and Judges

In the final step, the last element to consider is the relationship between advisors and judges. For instance, Yaniv and Kleinberger (2000) suggests that it is easier for an advisor to lose trust of a judge than to gain their trust, especially if the advisor is considered as giving poor advice by the judge. This is named as asymmetric relationship, as advisors are under the influence of judges. The experiments of Budescu et al. (2003) attempts to demonstrate how the asymmetric relationship works between judges and advisors. They have suggested that judges were very sensitive to the amount of asymmetry in advisor forecasts, as the level of confidence between judges and advisors increases when the level of asymmetry between them increases. This study proves usefulness in business and team contexts, as how advisors are perceived in these contexts by the judges and to what extent how their advice is valued. However, it should be still clear that the amount of punishment that judges can take from advisors and vice versa is still present, and the possibility of egocentrism in judges still exists.

Repeatedly, asymmetric relationship between judges and advisors proves the presence of possible self-serving bias discussed in perception of advice. Favorably, two studies by Yaniv and Choshen-Hillel (2012a; 2012b) show ways of bias-correcting for judges. In the first study, Yaniv and Choshen-Hillel (2012a) investigated how prior opinions before receiving advice influenced decision-making; while in the latter study, they examined how taking a perspective of an advisor changed judges' decision-making capabilities. Yaniv and Choshen-Hillel (2012a) has unveiled that "blindfolded" participants, which are participants without prior opinions, were able to use advice more efficiently, and were weighting advice more equally. In contrast, they were less confident about their judgements, compared to the participants who hold prior opinions before making a decision. In Yaniv and Choshen-Hillel (2012b), it was demonstrated that if judges took the role of an advisor before presenting an opinion, the decision accuracy would increase and the egocentric bias that judges show would decrease. Together, these studies indicate that holding opinions before decision-making will substantially influence decision-making, in a way how judges shape their knowledge and skills about a subject. Evaluating advice from another perspective and judging situations without prejudices would increase decision accuracy considerably.

1.4.1 Individual Differences between Advisors and Judges

Because of the human factor in JAS, individual differences would have some effects on advice exchange. Yet, there are some limitations in terms of how individual differences are determined and measured. Firstly, individual differences are very varied because of their nature, so it would differ from person to person. Secondly, there would be a chance that other factors different from individual differences would directly or indirectly effect advice exchange. Thus, it would be very difficult to measure the effects of individual differences in this context. In fact, this is one of the drawbacks of the study of LePine et al. (1997). In their study, they only measured conscientiousness and cognitive abilities in team-level decision-making. Even though it does not directly include advice exchange, its results can be applied to advice literature. LePine et al. (1997) have presented that teams who are high on conscientiousness and cognitive abilities would increase decision accuracy, and the members who are low on these measures would decrease overall team performance. These results can be interpreted in a way that advisors might be high on conscientiousness and cognitive abilities. Nonetheless, advisors should have other dimensions that could affect their behavior, and this study fails to show this.

1.4.2 Feelings of Power within Advisors and Judges

In addition to individual differences, feelings of power can influence how advice is received and used by judges, and how judges treat advice. On one hand, the experiments of Schaerer et al. (2018) shows a detailed analysis of how feelings of power influences advisors and the advices given by them. The results of their experiments resulted in that advisors have more sense of power while they are giving advice, as they perceive that they are influencing the judges while giving advice. In addition, they suggested that the ones that want to increase their sense of power were more likely to give advice, given the reason that they believe they guide the judges who are listening to them. This may explain the reason that why would advisors become advisors in the first place, and how they stay that way. Further, it would be also applicable in business environments, given in regards of the function of advice exchange between employees and to what extent the ones in the advisor positions have feelings of power.

On the other hand, feelings of power influences judges in an exceptional way. As shown by See et al. (2011) and Tost et al. (2011), judges who have high levels of power tend to utilize advice less. Based on their experiments, See et al. (2011) suggests that the more power the judge has, the more confident they become, hence their less tendency on receiving and utilizing advice. However, inflated confidence has a shortcoming: they will have less accuracy in their final decisions; but if they receive advice and revise their decisions, their confidence will significantly increase. Furthermore, Tost et al. (2011) includes competitiveness to discern the judges' behavior whom have high power. Judges will feel threatened if there is a competitive environment, and that will increase their confidence, resulting in discounting the advice they are receiving. In contrast, Tost et al. (2011) presents that if judges cooperate with their advisors instead of competing with them, they will feel less confident and become more likely to utilize advice. As a result, judges who have high feelings of power are more likely to discount advice compared to their colleagues who have low feelings of power, which will make them resilient to advice utilization.

1.5 Conclusion

This literature review explored the concept of advice, how it worked, how it is exchanged, and how it is perceived. General findings discussed by many scholars induce that advice takers (i.e. judges) would not value advice very much, on behalf of the expectations of advice givers (i.e. advisors). In other words, advice takers will ask for advice and take it, however, in terms of decision-making, advice takers' priority of opinions will shift in the directions of their opinions instead. Moreover, advice takers will value the advice givers that are closer to their beliefs and opinions, instead of the ones who stand further from their opinions. Possibly, advice takers are likely to accept advice from multiple advisors, however, their attitude on selecting advice would still continue, by valuing the ones that are close to them and distancing anyone else who are not agreeing with them. As a result, the selfish behavior of decision-makers as advice takers could result in a dangerous situation, with them likely staying away from criticism and regenerative feedback.

The previous studies, which are ongoing since the 1980s and became prominent and 1990s and 2000s, are getting dated, especially because of their perspective on individuals. Even though the results are applicable in multiple situations, complex challenging environments like businesses add more consideration to the table for researchers to evaluate. Nonetheless, specific studies for advice in business environments lack of quantity, though getting more attention starting from the 2010s. Adding more parameters to the experiments that previous researchers have passed has multiple indications, including possible changes from ominous facts this advice literature area has discovered over these years.

In the last decade, new communication technologies such as video conversation and instant messaging entered into people's lives. These technologies are also adapted in business environments, sometimes overshadowing face-to-face interactions. In other words, the rapid technological changes after the late 20th century has definitely affected human behavior, and how people exchange advice in this paper's context. There is no doubt that these affect the relationship between judges and advisors, and how advice gets shaped and transformed through these channels. As a matter of fact; it would completely change the perception of advice by the judges, and the way advice is presented, by advisors. In addition, with easy to accessible sources with continuous information flow, and information technologies making it much easier to access to people, a judge might be able to gain more power and be resilient to their advisors. In this way, judge-advisor systems are not what they were when advice literature started, with influences from the inside and outside of their environment.

1.6 Limitations

Advice literature has shown that people are willing to take help when they are presented with it. However, challenges occur in terms of using advice in terms of decision-making. Studies have shown that judges become relinquent when they are presented with advice, sometimes up to some extent that the reason why these individuals have requested advice becomes unclear. This results in advice getting discounted, not getting used in decision-making at its full potential by the judges. The reasons for this behavior stated by the scholars as the egocentrism (Yaniv & Kleinberger, 2000) and self-serving bias of the judges (Yaniv & Milyavsky, 2007). In addition, several personal characteristics may affect this behavior, such as the individual differences (e.g. LePine et al., 1997) and power differences (e.g. Schaerer et al., 2018) between the judges and advisors. Even though these studies try to put reasoning into this decision-making process, they often present a limited explanation for this behavior. One such reason may come from the limitations of the methods of these studies.

As mentioned, most scholars in advice literature use JAS to carry out their experiments. While these studies create an easily observable and manipulative environment for the scholars to test factors on how advice will affect decisions, the use of computerized advisors and the questions that judges are presented during these experiments, create shallow encounters for the judges. In other words, the computerized settings make the experiments less realistic, failing to present all aspects of face-to-face communication. Very few studies actually explore this concept, such Hedlund et al. (1999), who have shown that both face-to-face communication and computerized communication has their positive and negative outcomes. In such cases, it may be presented that neither face-to-face or computerized communication and the JAS can fully accurately simulate advice exchange.

The popular but older studies in advice literature, such as Harvey and Fischer (1997) and Yaniv and Kleinberger (2000) has revealed the key reasonings in advice literature, but they remain limited in methodology. Replication of their studies may create different outcomes after the 20 years they have been published, as the process of information gathering with the fully integration of the Internet has become widened. The information from the Internet can be used both by advisors and judges, influencing their knowledge. Therefore, judges may feel that they should be less dependent on their advisors, resulting with them using their own knowledge to make decisions instead of constantly getting external help. It can be presumed that the judges of today are more knowledgeable, as they have the ability to use the new sources of information to augment their knowledge.

2 Hypotheses

For this thesis, I will focus on the much informed and knowledgeable judges, and to what extent they utilize or discount advice in decision-making. To explore this, I observed how judges are getting influenced by the two types of advice in this process: naïve advice and expert advice. Naïve advice, as defined by Schotter et al. (2003), is the advice that is given by the close social environment of the judges. In most of the advice literature; advisors are assumed as being superior to the judges in terms of experience, knowledge, and position. However, the advice that may be given by individuals who are closer in relations are rarely observed. Supportively, Schotter et al. (2003) indicate that naïve advice has the power to increase decision accuracy, just as the advice given by superiors, proposing that naïve advice can be as useful. The other type of advice, which is expert advice, can be defined as the advice given by the superior advisors, classically in the JAS. Generally, expert advice is trusted by the judges as they indicate more knowledge and expertise, and experts are perceived as being more qualified. Hence, experts are used as the main sources of advice in JAS. Compared with less qualified advisors, judges are more likely to consult the more knowledgeable expert advisors compared to the less knowledgeable novice advisors (Meshi et al., 2012). In addition, to help them assist more in decision-making, judges can opt to get advice from different sources, which is found to increase decision accuracy (Yaniv, 2004a). From these observations, and bringing naïve advice into the picture alongside with expert advice, the first hypothesis can be proposed:

H1: *Expert advice will be more influential compared with naïve advice in decision-making, and the initial opinion will be utilized more in the direction of expert advice.*

Further, the structure of the experiments in advice literature are often overlooked. In most JAS, judges are instructed to answer very simplistic questions, often with one answer (see Yaniv and Kleinberger, 2000 for an example). Cases with multiple answers or with no true answers, in addition to situations that require complex decision processes, are often omitted in JAS, possibly to not complicate the experiments. However, this drastically changes the experiments' ability to simulate real life, hence, it does not put much effort at the complexity of decision-making in real life events. Different than a controllable laboratory setting, most social decisions often include challenges that are linked to each other. In addition, there are multiple problems needed to be solved at the same time. In a decision-making process taking place in real life situations, the complex and challenging environment often becomes more significant, and the search for reliable outside help becomes more desirable. To solve the problems in decision-making, the need for more quality in advice may become crucial for judges. As in Harvey and Fischer (1997) and Yaniv and Kleinberger (2000), in judges' eyes, poor quality advice will differ significantly from their opinions and good quality advice will be closer to their opinions. However, for social decisions, the effect on quality in advice may become more significant in decision-making. From these observations, the second hypothesis can be proposed:

H2: *Expert advice will be received as more accurate and reliable by the individuals compared to naïve advice; therefore, it will increase the quality of decision-making.*

To sum up, with this thesis, my goal is to try a new method of a judge-advisor system, by including multiple parameters, different samples, and a different method to test this system. As implied too in the literature review, I am concerned that old studies in advice literature have become too simplistic and one-sided over time, which calls for replication to make these key findings more significant and relevant for recent studies. In addition, advice literature calls for more variables to be tested, in which different methods are required to be used. Limitations in advice literature still occur, but recent studies have the power to elude these barriers by setting up new ideas, methods, and testing. In the following section, I will be showing my efforts to create this new system as accurately as possible.

3 Methodology

For this thesis, an online experiment made in Qualtrics XM was conducted. The website link for the online experiment was distributed through international student communities located in Ankara, Turkey and Leuven, Belgium. The participants joined as anonymous individuals, however it is acknowledged that they were mostly university graduates with different nationalities. A total of 88 responses were collected, in which 53 responses were completed and used as the sample. From this sample, one result was omitted because of incomplete responses, leaving the final sample as 52 participants. These participants then were distributed into four groups randomly, receiving one of the four scenarios. Of all the 52 participants who have fully completed the experiment, 10 were assigned to Scenario 1 and 2, while 20 were assigned to Scenario 3 and 11 were assigned to Scenario 4. In average, participants took 404 seconds (SD = 220 seconds) to fully complete the experiment.

Participants joined the experiment via the online link. Before the start of the experiment, participants were asked to answer three short questions about their age, their education level, and their employment status. This was requested to make sure that the sample is coming from similar backgrounds, so the influence of personal and individual differences on receiving advice is limited. After they have finished this section, they initiated the experiment by moving on to the next question.

The experiment was covered in two sections: the first section is the same for every participant, while the second section is randomly assigned from four scenarios (i.e. control and treatment groups). In the beginning, a cover study was provided to the participants. They were assumed that they are promoted as the vice president of a big-scale company, and they have to relocate to the United States where their new office is located. Following this event, the participants decide to purchase a house after their arrival to the United States, and they do prior research about the housing industry in the area. They learn that in order to purchase a house, they have to estimate the price of the house and bid for it, and the exact value for the house is uncertain and unknown to everyone. This information is given such that the participants feel they are in an uncertain situation, as weighting and trimming advice is known to increase decision accuracy in uncertain environments (Yaniv, 1997).

Meshi et al. (2012)'s study was used as a reference in the online experiment, as both the methods use the estimation of real estate prices as subject to advice taking. However, different dependent and independent variables were used to distinguish this experiment from theirs. First, in their study, participants were tasked to guess rental prices for apartments in New York City; whereas in this study, participants were tasked to guess sales prices for houses in Houston, Texas. Next, the use of cover story in this study was to make participants feel they are in a sincere environment, and make their decisions more seriously. Finally, Meshi et al. (2012)'s study examined brain activity as its main data collection method, which was not the focus on this experiment.

Later in the experiment, the participants agree on four houses (Appendix 1) as their final choices for the estimation. General information about the houses are given to them as a result of their research, to assist them more help in determining the values for each house. Namely, the houses are listed with their pictures from exterior view, along with their features (i.e. interior and exterior area, number of bedrooms and bathrooms). It is stated that all of these houses are at the same location and they are equally close to the same facilities, in addition with them being the closest to their new office. This information is given that no additional features are interfering the estimation process. Moreover, the minimum, maximum and average values of the houses are given to the participants to assist them further. The values are stated as $100,000 minimum, $500,000 maximum, and $300,000 average for each house. Actual mean listing price for the houses was $322,450 (SD=$38,371.04) and the mean estimation was $295,922.75 (SD=$52,860.87).

The houses and their information were gathered from Zillow.com, which is a housing website operational in the United States. These houses were chosen from the same neighborhood in Houston, Texas; which were listed as on sale properties as of July 2020. Two values were used for the sake of the experiment: listing prices given by the sellers and estimated values by Zestimate®. At Zillow.com, the Zestimate®[2] service is used to evaluate how much a house listed on the website is overvalued or undervalued. Listing-to-estimate values for the houses selected for the experiment range from 0.85 through 1.08. Houses which score under 1.0 are overvalued and which score above 1.0 are undervalued (mean=0.9182, SD=0.1204). Along the four houses that were chosen for the experiment, three were actually overvalued and one were actually undervalued. A tricky choice in houses were added as well, for instance, the seemingly most valuable house by looking at the features was not the most valuable house in the list.

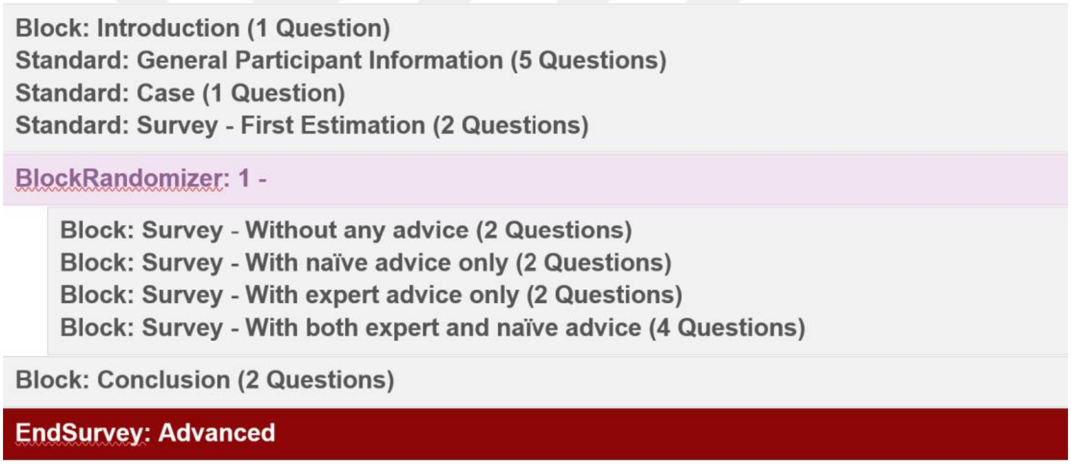


Figure 1: The flow of the experiment. After completing the first estimations, participants were randomly assigned to four scenarios representing treatment and control groups. Randomization was provided by Qualtrics XM's built-in randomizer function.

After all of the houses and the information were given, the participants were asked to estimate how much the houses are worth, without receiving any advice. A slider was placed for each house (Figure 2) to make participants submit their estimations easier. When participants completed this part, they are randomly assigned in one of the four scenarios. The first scenario, which was the control group, received no advice. When this scenario was displayed, the participants were asked to "revise" their opinions, as similarly used by Meshi et al. (2012) when their participants were encountered with the no advice scenario. When the second and third scenario were initiated, a table of estimated prices of each house by naïve advisors or expert advisors respectively were shown. Participants were told that the advice they are receiving either came from their best friend or a professional real

[2] https://www.zillow.com/zestimate/

estate agent, depending on the scenario. Naïve advice was given in parallel to the listing prices for the houses listed in Zillow.com, while expert advice was given in parallel to the Zestimate® values. Finally, for the fourth scenario, naïve advice was displayed first, then expert advice was displayed later. Participants who encountered this scenario filled in two estimations for each house: one after they have received naïve advice and one after they have received expert advice, following with the naïve advice.

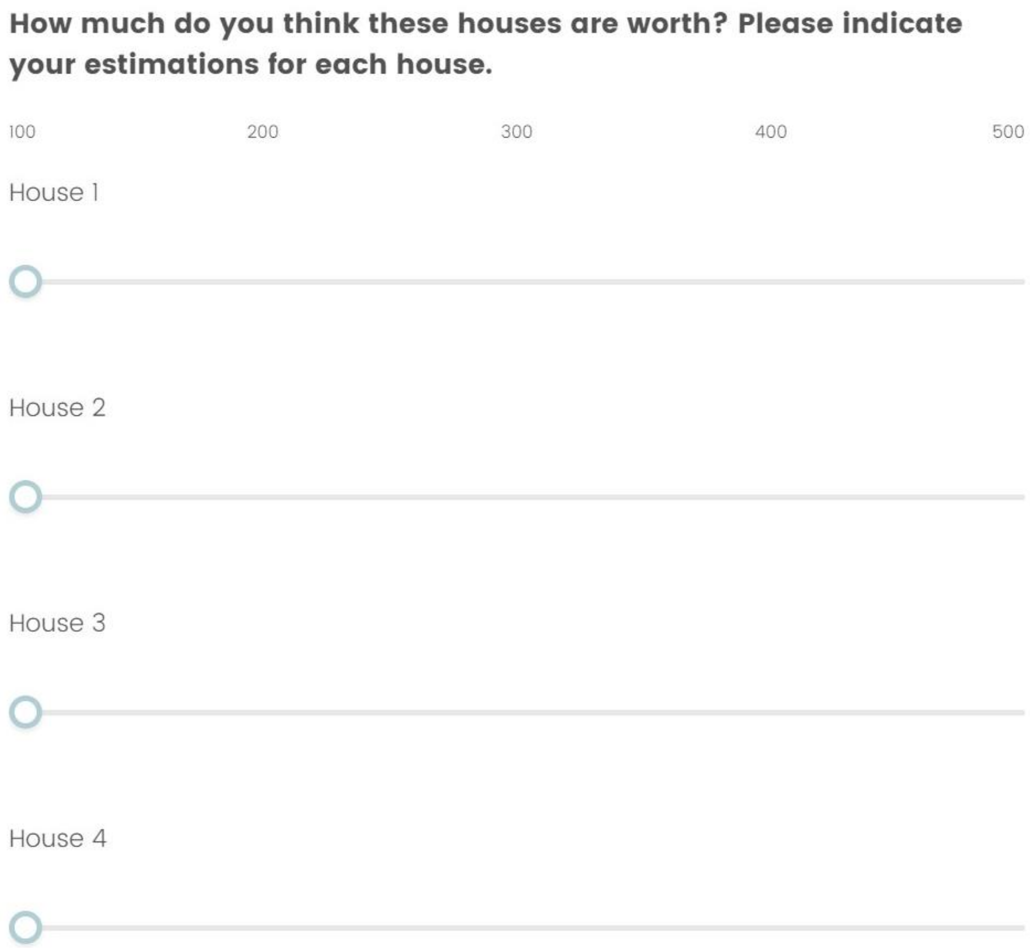


Figure 2: The slider model given to the participants for the submission of the answers.

The experiment was finished when the participants submitted all of the initial and revised estimations for each house, and they were shown the actual prices of the houses at the end of their scenario. Participants concluded the experiment after voluntarily giving feedback. The website link for the experiment was active three days and was made inactive after it has received 88 complete and partial responses. Because the completion of the experiment was essential for the calculation of the results, partial responses were dismissed. The calculations of the results were started after the responses were trimmed to the accepted sample of 52 participants.

4 Results

The calculations of the accepted sample (n=52) were done using R-project. Repeated measures analysis of variance (ANOVA) was used separately for treatment and control groups. To test the fitness of the models, linear regression was applied to the initial and final estimations given by the participants.

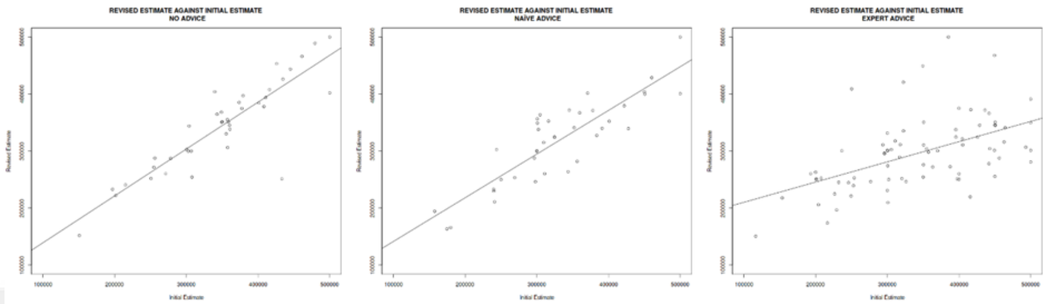


Figure 3: Regression models for scenarios 1 (i.e. no advice), 2 (i.e. naïve advice only) and 3 (i.e. expert advice only).

In the beginning, the regression models were constructed for the scenarios. The above figure shows the regression models for the participants placed in scenarios 1, 2 and 3 (Figure 3). For the participants who have received no advice, a slight change in estimations have occurred when they were asked to revise their opinions, with a mean difference of \$23,158 (SD=\$32,691). The R^2 result calculated for Scenario 1 was 0.77, which secures the well-fitness of the control group. For Scenario 2, which includes the participants who have received naïve advice only, a similar pattern was observed, with a R^2 value of 0.76. Revisions of initial opinions occurred after naïve advice was received, but they did not create a very significant effect at the revised estimations.

On the other hand, for Scenario 3, which includes participants who have received expert advice only, very significant changes have occurred. Alongside with this, some extreme values were also recorded, resulting in a R^2 value of 0.26. This result can be somewhat explained by the larger number of participants (n*=20) compared to the other scenarios, as the randomizer function of the experiment placed more participants into Scenario 3. Nonetheless, an increased amount of revisions was recorded compared to scenario 1 and 2 were recorded; which, at the beginning, signaled the increased effect of expert advice on final estimations of the participants.

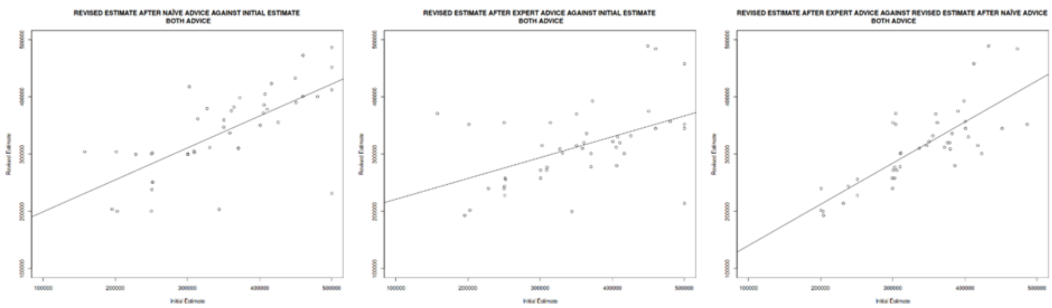


Figure 4: Regression models for Scenario 4 (revised estimates after naïve advice to initial estimates, final estimates against initial estimates, final estimates against revised estimates after naïve advice).

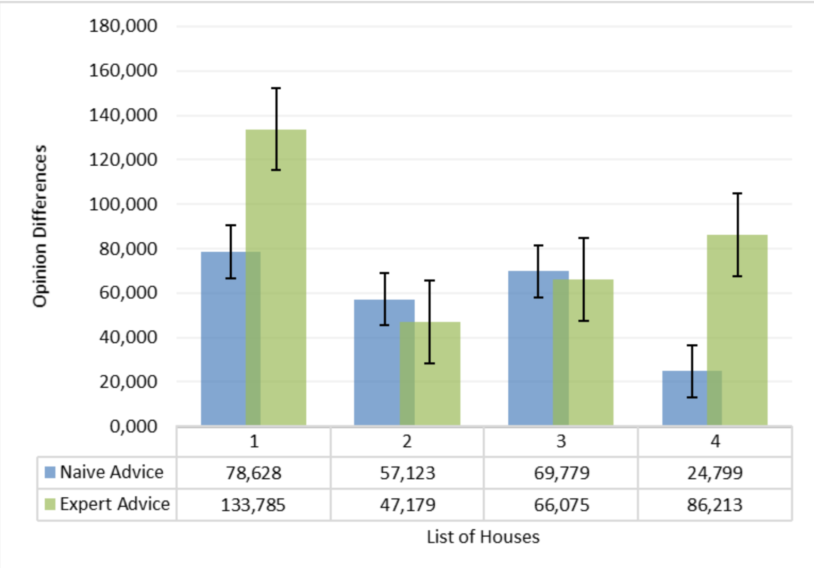
For Scenario 4, three models were constructed: one after the participants received naïve advice, once after the participants received expert advice, and one for the initial and final estimations of the participants. The above figure shows the regression models for the participants placed in scenarios 4 (Figure 4). The most well-fitted model was recorded for the final estimations against the first revised estimations after receiving naïve advice, with a R^2 of 0.61. The least-fitted model was for the final estimations against the initial estimations, with a R^2 of 0.25. A better fitness of the model has been achieved at the middle of the experiment, for the estimations after the participants have received naïve advice against their initial opinions, with a R^2 value of 0.49. Again, similar for the Scenario 3, plenty of random values were recorded, signaling drastic changes for the initial and final opinions which the participants have given for the houses.

Overall, the regression models have displayed weighting and trimming behavior of advice. Participants from all scenarios have taken advice and used them to change their initial opinions to certain extensions. Even for the control group who have received no advice, changes in estimations have occurred. Nevertheless, the scattering of randomized values has created the challenges for the calculations of the results. In order for the select the values that are more fitted to the model, trimming of the extreme values were done during weight-of-advice calculations. This process will be explained in the following segments later in this section.

In the next step, mean values of opinion differences were calculated for each scenario on each house. Opinion difference (OD), as defined by Meshi et al. (2012), is the absolute value of the difference between an individual's initial opinion and an advisor's opinion. The equation for this value is given as follows:

$$\textit{opinion difference} = |\textit{advice} - \textit{initial opinion}|$$

In this segment, I will use OD values to understand the individuals' utilization of advice, as OD and advice utilization are inversely related to each other (Meshi et al., 2012). The histogram below (Figure 5) presents the OD occurred for each house presented to the participants during the experiment:



	1	2	3	4
Naive Advice	78,628	57,123	69,779	24,799
Expert Advice	133,785	47,179	66,075	86,213

Figure 5: Opinion differences on each house. Values taken from participants who have received naïve and expert advice separately.

Variations of OD occur for each house. The most drastic variations among OD are visible through the values of House 1. For the vast majority of the participants, this house was estimated as the most valuable house in the list, and the participants gave their highest values to House 1. To unknown to the participants, however, House 1 was a tricky choice as it was not the most valuable house among the four houses. As a result, OD for House 1 significantly increased, but the naïve advice receiving participants got the closest to the advice by $78,628 (SD=$46,628).

For houses 2, 3 and 4; more reasonable ODs are observed. The least OD occurred for participants receiving naïve advice solely on House 4, with it being approximately $25,000 (SD=$25,949). On the other hand, participants who have received expert advice solely on House 4 an OD of nearly $87,000 (SD=$56,378). In terms of houses 2 and 3, closer ODs between naïve advice and expert advice receiving participants are recorded, suggesting that the advice for these houses, both naïve and expert, triggered similar reactions for participants who have encountered scenarios 2 and 3.

Separate calculations were done for group 4, as to separately visualize the influence of the two types of advice which the participants in this scenario has been received. The histogram below (Figure 6) presents the OD recorded by the participants who have encountered the both advice scenario:

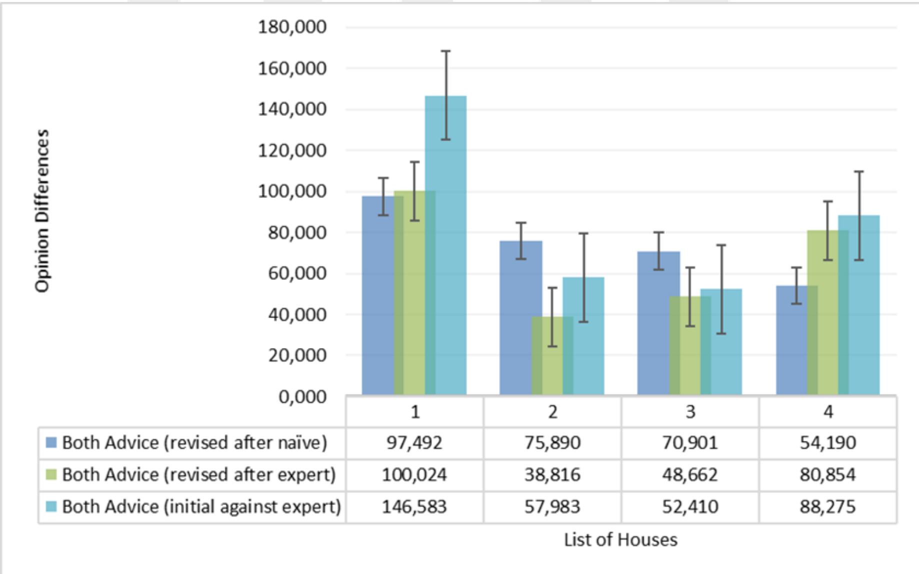


Figure 6: Opinion differences on each house. Values taken from participants who have received naïve and expert advice simultaneously.

Similar to the scenarios 2 and 3, the most elaborate OD values are recorded for House 1. The highest OD in this experiment was calculated for this scenario in House 1, where the initial estimation was the furthest away from the advice, resulting in approximately $150,000 of movement from the latest advice (SD=$50,558). For this house, however, the impact of expert advice after the participants have received naïve advice is minimal, with a very slight change in OD. For House 4, a similar result is observed: ODs increased after both advice have been received by the participants.

For houses 2 and 3, OD values are observably lower and closer to the advice value. ODs after participants have received naïve and expert advice simultaneously are balanced at the final estimation value, which can be viewed at the "revised after expert" case. It can be commented that expert advice had more positive effect in final estimations for these houses. However, for houses 1 and 4, expert advice was further away from the initial opinions, but the ODs have stabilized after the participants have received expert advice.

Additional calculations were done using the weight-of-advice (WOA) index (Meshi et al., 2012; Yaniv, 2004a). The equation for this value is defined as follows:

WOA = (revised opinion – initial opinion) / (advice – initial opinion)

As defined in Yaniv (2004a), WOA shows to what extent advice is discounted in a participant's opinion after receiving advice, by calculating the weight of the advice that is assigned to the revised opinion. In this proportional value; a result of 1.0 means the initial opinion is totally discarded in respect of advice, while a result of 0 presents the advice is fully discounted for the sake of the initial opinions. Likewise, a value of 0.5 presents the equal weighting of both initial opinion and the advice.

WOA was calculated separately for groups 1, 2 and 3; and a three-way calculation was done for group 4. One WOA value was undefined (i.e. 0/0), thus it was excluded from the calculation. For this experiment, the absolute values of the amounts were not calculated, since negative values are suggesting that participants are moving away from the advice (Meshi et al., 2012). Respectively, by remaining parallel to their methodology, WOA values over 1.3 was removed; by giving the fact that values over 1.3 can be incorrectly interpreted as being heavily influenced by advice, while no such effect may not be present. In addition, values under 0.0 were removed as well, to correctly calculate the proportion of advice used in participants' final estimations. The table below (Table 1) are the WOA values calculated from the trials after the mentioned trials are removed from the calculations for further accuracy.

Table 1: Mean weights of advice.

	mean of WOA
Participants receiving naïve advice	0.3558
Participants receiving expert advice	0.7195
Participants receiving both advice (initial by final)	0.6771
Participants receiving both advice (initial by naïve advice)	0.4906
Participants receiving both advice (naïve advice by expert advice)	0.6254

All participants of the experiment have used advice to change their initial opinions. Overall, the mean WOA values suggest a presence of egocentric discounting as defined by Yaniv (2004a). Naïve advice receiving participants placed more weight on their initial opinions ($F_{(1,37)}$=70.51, $p<0.001$), a mean WOA over 35% is observed over the final estimations (SD=0.3499). For the participants who received expert advice, this shift is changed drastically: more value on the advice was given by them in this scenario ($F_{(1,77)}$=68.59, $p<0.001$), as approximately 72% of WOA was placed on their final estimations (SD=0.3734). By a significant amount, expert advice was valued more by the participants compared to the ones receiving expert advice, in the case when the participants only received advice from a single source.

The participants who have received both types of advice produces similar but not equal results compared to the single advice receiving participants. Overall, 68% of WOA calculated, suggesting the overall dominance of advice on the final estimations, after the participants have received both of the advice ($F_{(1,35)}=35.27$, $p<0.001$). 49% of WOA was calculated for the first leg of this scenario, implying almost equal weighting for initial opinions and naïve advice. However, 1% of the estimation is still occurring from the participant's initial opinions. After the participants have moved to the second leg of the scenario, they have put more value on expert advice as well: roughly 63% of the final estimation was occupied by the expert advice, upholding the dominant proportion.

Repeated measures ANOVA has proven that solely naïve and solely expert advice had significant effect on the final estimations of the houses, for which the participants who have placed in scenarios 2 ($F_{(1,37)}=70.51$, $p<0.001$) and 3 ($F_{(1,77)}=68.59$, $p<0.001$) respectively. The revisions of estimations in Scenario 1 was also deemed significant ($F_{(1,38)}=14.72$, $p<0.001$). For Scenario 4, however, different results have occurred compared to the single advice scenarios. The only significant effects came from the naïve advice that is given to the participants ($F_{(1,35)}= 55.52$, $p<0.001$) and from the revised estimations that the participants submitted after receiving naïve advice ($F_{(1,35)}=35.27$, $p<0.001$). The impact of expert advice ($p=0.467$) and initial opinions ($p=0.123$) were deemed insignificant. These prove different results than the single advice scenarios, since expert advice was found to be almost entirely discounted in Scenario 4.

Given the results of the repeated measures ANOVA and the means of WOA, for cases with a single advice, hypothesis 1 can be accepted, since expert advice had a significant effect on decision-making, in which case for the final estimations of the participants. However, for cases with both advice, Hypothesis 1 should be rejected, since the effect of expert advice is not significant and only the effect of naïve advice is significant. Nonetheless, it can be commented that advice still had an effect on decision-making, not regarding the advice type.

To comment on Hypothesis 2, the quality of advice should be determined. In that case, since quality of advice is bound to the perspective of the participants (i.e. judges), WOA values can be put into use. For single advice cases, participants discounted naïve advice and utilized expert advice, as observed in the mean WOA values. For the cases with both advice, a similar pattern cannot be observed since the effect of expert advice was not significant. From these results, it can be commented that expert advice was closer to the initial opinions, hence they are deemed as good quality advice by the participants. However, the mean values of ODs stated at the histogram below (Figure 7) show a different picture:

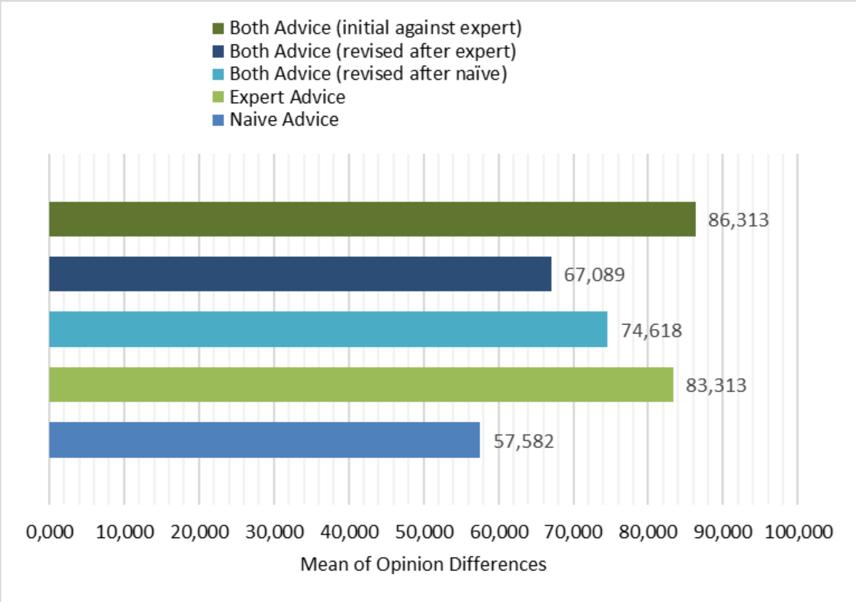


Figure 7: Mean of opinion differences for each scenario. For Scenario 4, values from all three steps were calculated.

As demonstrated by Figure 7, ODs for cases with expert advice are actually higher than cases with naïve advice. Hence, it cannot be concluded that advice quality is perceived and used by the participants, as there is inconclusive data. Even though it can be observed that advice has increased decision quality, there is no judgement among participants (i.e. judges) among the quality of advice. Thus, Hypothesis 2 should be rejected as the quality of advice is deemed not observable in this experiment. For this specific case, the quality of advice paradigm researched in advice literature is not significant.

5 Discussion

So far, this experiment has demonstrated that the participants have used advice to assist them in decision-making. For single advice recipients, expert advice was more influential than naïve advice. On the other hand, for recipients that have received both types of advice; naïve advice, which was the first type of advice that they have received, was more significant in decision-making. While estimating the prices of the houses, participants did not significantly decide on what was good advice and what was bad advice. For most of the estimations, a mixed combination of initial opinions and advice were submitted as final results.

Firstly, the OD values calculated were, in general, were very high for all treatment groups in the experiment. This may signal that when participants made their first estimations, they were far away from any guidance and did not have any underlying knowledge about the subject, and hence made very inaccurate guesses. However, when these participants received advice, they may have panicked because their initial opinions were further than they have expected. As a result, they took the advice, regardless of deeming its quality, and used in decision-making. This result proves Gino and Moore (2007)'s discovery, as the more complex the decision-making process becomes, the more dependence of the judges on advice. In terms of desperately needing advice to make better judgements, one example happened at the estimations of House 1. For most of the participants, this house was perceived as the most valuable house from the list. However, this was not correct, as even though it had more superior features compared to the other houses. When the participants were presented with advice and realized that they have overvalued House 1, their estimations significantly declined, no matter what type of advice they have received, as seen in the high values of ODs that has been recorded. Nonetheless, when the participants encountered advice, they used it to correct their wrongdoing, and thus increased their decision quality. Moreover, this advice utilization was more present in single advice recipients who have received expert advice, as single advice recipients who have received naïve advice actually discounted it, as visible in the WOA calculations. Even though advice has increased decision quality in participants' estimations, a judgement in rather the advice is good quality or poor quality is not observed in this experiment.

While designing the experiment, I have realized that when participants received naïve advice, it might have triggered an additional effect coming from the source of advice that would increase the percentage of advice utilization, given the fact that naïve advice is received by the judges' close contacts. As it was shown in the results, naïve advice did not create this sort of effect in the final estimations. It can be discussed that since the participants were inexperienced in this field and they were trying to make decisions at a context they had little to no experience, so they might have trusted expert advice more than naïve advice as to get to closer estimations. However, this does not indicate that such an effect would not be present in other cases. A close friend effect on advice can be further researched on studies focusing on this topic, since my literature review have failed to find much studies focusing on this effect.

One limitation and possible consequence of the experiment was how to give out advice to the participants. Because of this experiment's structure, advice had to be given as a list, rather than genuine assumptions that have gathered from real sources rather than virtual sources. Because of the limitations of the current situations that have limited the scope of the experiment, face-to-face interactions had to be substituted with virtual interactions with machinery. While determining the advice values, naïve advice was based on the selling prices of the houses and expert advice was based on the estimations of the actual worth of the houses. This was to make sure that expert advice would be closer to what these houses were actually worth. On the other hand; in real life, the estimations can help to decide whether an option is worth in investment or not, but it might not be an exact determination of what this option actually costs. By saying so, for the naïve advice and expert advice that I have given to the participants, neither of the values indicate the “true” values of the houses. While the estimations (i.e. expert advice) could say what one house should sell for, the selling price (i.e. naïve advice) is the one price that the house will be determined as worth on the paper. In other words, for this experiment, there were no such thing as a “true” value. As such, the participants were asked to guess a thing that was uncertain. In this way, I was able to observe how would they act in an uncertain environment. Although it is not the focus of this experiment, the effect of the two types of advice that I have investigated in an uncertain environment can be a topic for another study.

Further limitations occurred during this study was the information of the houses provided to participants. In order not to take so much time and effort of the respondents, only the basic features of the houses were given. However, few of the participants have given feedback that they would require more information in order to correctly guess the prices of the houses. It is true that for each participant, different features of the houses express different methods of increased or decreased valuation of the houses. In other words, individual differences might have an effect on the initial opinions of the participants. Even though I was aware of these different factors on decision-making, more information was not given on purpose. While constructing the experiment, I have realized that the more information was given to the participants, the more they can use this information as “advice”, which was not desirable for this experiment. The purpose of this experiment was to examine the impact of “human” advisors’ opinions in judges’ decision-making, and any type of recommendation and opinion that may look computerized needed to be avoided as much as possible. Although a computer-neutral study was not totally avoided, the impact of other external factors on participants’ decision-making was tried to be neutralized as much as possible.

Besides the limitations this experiment was faced with, the results that can be taken can be applied into social and administrative environments. For instance, one industry that is facing many uncertainties similar to this experiment are financial services. As market trends in the financial environment are constantly changing and are bound to multiple uncertain factors, there is no such thing as a one true fact in the market. Whether it is for professionals and novices, experienced or inexperienced, advice is often sought upon and used, and the take-outs from this experiment can be applied to this environment. When it becomes certain that opinion differences are becoming larger, advice is more utilized in decision-making. Instead of solemnly using professional opinions, opinions from close and less experienced sources can be used, though there is a possibility for them to be discounted more than professional opinions. When decision-makers use both types of advice, they are more likely to utilize the advice coming from close sources; and the sooner they have received the advice, the more possibility for them to utilize it more.

General Conclusion

With this thesis, I have tried to explore and explain the concept of advice, how it is exchanged, how it is influenced and how it influenced people. In the beginning, I have started with the literature review to understand what has been previously unearthed in terms of this subject. Afterwards, I have identified the weaknesses and limitations of these previous studies, and created my own study to explore these shortcomings in an online environment. Finally, I have reported and interpreted the results, and compared to the previous knowledge gathered by the scholars of advice literature.

To kickstart this journey, I have started with the definition of advice. It has turned out that so far in the advice literature, the definition of advice was illustrated as a murky concept, not holding onto a unified clarification. Even so, I have discovered that most of the scholars in advice literature has gone with their own definitions of advice, therefore making this concept more ambiguous. However, most of these scholars have interpreted advice to be something that is exchanged between two parties: one that is receiving advice and one that is giving advice. From this classification, I have moved on to how advice might look like. It has been unraveled that advice can take many shapes and sizes. It can be given by humans, or it can be given by machines. In some cases, the receivers will not even know who have given the advice. It can be given by experienced professionals, and it can be given by less experienced professionals. No matter who gives it, it will create a difference in how the advice is perceived. People will ask for advice, but people will not always do as what they have been told. If people think that the advice is not agreeable with their thinking, they will not listen. If people think that the advice is not given by someone who is not experienced enough, they will not listen. Last but not least, if people think the advice is misleading, they will not listen. In addition, not only complying with the advice, they will punish the advisors that have led them into the wrong direction. In comparison, the advisors will do the same to them.

Subsequently, there is one question that can be asked: Why are people asking for advice if they are not going to listen? In point of fact, it has a simple answer: to make better judgements and make better decisions. Even though advice takers (i.e. judges) seem like they ignore advice, they still use advice in decision-making. It can be stated that while making decisions, judges unconsciously put less value on advice, and that is defined as advice discounting in advice literature. Research has shown that no matter how convincing the advisor is, judges discount advice, due to the unconscious superiority of their own opinions. Yaniv and Kleinberger (2000) describes this as an egocentric bias, while Yaniv and Milyavsky (2007) adds self-servicing bias. Besides for believing that their own opinions are superior, judges also criticize advisors in their minds. According to the study of Yaniv and Kleinberger (2000), judges simply assign the advice that is closer to their opinions as “good” advice, and the ones that are further from their opinions as “bad” advice. Thus, they utilize the superior good advice and discount the inferior bad advice. Judges could also get multiple sources of advice, but they will discount the advice that are further away from what they are initially thinking (Yaniv and Milyavsky, 2007). Finally, the personal characteristics of judges and advisors could explain to what extent advice will be discounted. If judges feel high levels of power, they will become overconfident, hence they are more likely to discount advice (See et al., 2011).

It is certain that advice literature has been successful to analyze the concepts and processes regarding advice, as it can be taken from my review of the literature. However, most of these studies are getting outdated, and new studies testing new concepts are very much needed. In particular, for judge-advisor studies which became the flagship method of advice literature, new ways of experimenting with subjects were needed to counteract their one dimensionality. In order to combat with these problems, I have created my own method to test one of the concepts that were not explored deeply in advice literature: the impact of naïve and expert advice on decision-making. Naïve advice, which comes from the judges' close sources, were lacking of research. While naïve advice was to be found to increase decision accuracy (Schotter et al., 2003), how would it differ from expert advice was not observed. Thus, for this thesis, I planned to test naïve advice alongside with expert advice with an experiment that is conducted online.

In the experiment, when the participants were presented with the houses, their only guidance were their gut feelings and very basic estimations. They were powerful, yet helpless. After they have submitted their initial opinions, their estimations were collected for the second time after they have received advice, and I have observed that these estimations were different than what they have submitted initially. The opinion differences indicated that their first estimations were inaccurate compared with what the advice has stated. As a result, they were compelled to revise their opinions at the direction of advice. Nevertheless, different amounts of advice shifting were calculated for each group. When participants received expert advice, they shifted their opinions more at the advisor's direction. When naïve advice was received, participants chose to discount this advice and went through with their initial opinions instead.

While the results were desirable for the cases with single advice, when both advice were presented to the participants, unconventional results were recorded. No significance was recorded with the participant's revised estimates and expert advice, which was recorded true for the single advice cases. Instead, only naïve advice was deemed significant. Although it could be possible that naïve advice had a significant effect in decision-making, it could also suggest that the first piece of advice they have received had the most significant effect instead. Unfortunately for this experiment, the ranking order was not tested, as this result was unexpected. This phenomenon can be tested in further research as I was unable to test this condition.

In general, I believe this thesis has been a success. However, I believe that there were limitations in the application and design of the method. Due to unprecedented situations, the experiment had to be in an online setting, and the advisor role had to be computerized like the traditional judge-advisor studies. Further research that would include more interaction between the advisors and the judges can be conducted, as to test the effects if an advisor figure is present in judges' eyes. In addition to physical figures, teamwork can be introduced, placing judges and naïve advisors together in the same setting.

I would recommend businesses dealing with social situations such as real estate and financial services to get takeout from this thesis. When people come to seek help, do not underestimate them, especially if they look helpless, as they are open to receive help no matter what. Additionally, they can seek advice from their close sources and utilize them as well, and they might be effective. Nevertheless, the most important job goes to the experts as to guide them into the truth and increase the power of decision-making.

Appendices

Appendix 1: List of the houses and their features as displayed to participants in the experiment.

HOUSE #1

4 bedrooms
3,5 bathrooms
297 m² interior space
1173 m² exterior space

HOUSE #2

3 bedrooms
2 bathrooms
189 m² interior space
612 m² exterior space

HOUSE #3

4 bedrooms
4 bathrooms
272 m² interior space
688 m² exterior space

HOUSE #4

4 bedrooms
3,5 bathrooms
285 m² interior space
688 m² exterior space

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