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FRAMING AND STAKES: A SURVEY STUDY OF DECISIONS UNDER UNCERTAINTY

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Abstract

Using a survey study of 261 decisions under uncertainty, we explore the factors that explain risk taking behavior and those that predict the importance of a decision. We also examine the relationship between framing and status quo, the similarity between monetary and non-monetary decisions, as well as the similarities and differences among our three subject groups (Undergraduates, MBAs and Executives). We find that framing, domain, and probability of success have a strong influence on the probability of taking risks. Other factors, such as group, importance of a decision, and whether the consequences are monetary or not, do not seem to influence risk attitudes. Our analysis of importance of a decision highlights the frequency with which a decision is taken as a key variable. Our results suggest that the cumulative effects of unimportant and frequent decisions are greater than the cumulative effects of very important and infrequent decisions.

Keywords: Decision making under uncertainty, Framing, Importance and Frequency of Decisions.

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Introduction

A considerable amount of theoretical and, above all, empirical research has been dedicated to the analysis of decisions under uncertainty during the past few decades (see surveys from Camerer 1995; Luce 2000; Wu, Zhang, and Gonzalez, 2004). By and large, most of the evidence comes from experimental studies where subjects face choices designed by experimenters (Wu *et al.*, 2004). The few studies that use field data typically focus on specific domains (Fagley and Miller, 1990; Camerer 2000; Rettinger and Hastie, 2001) or are qualitative in nature (March and Shapira 1987; Nutt 1998). The present study pushes forward this line of research by reporting the results of a survey that examines different aspects of decisions under uncertainty. Moreover, these decisions cover a large range of domains, importance, and type of consequences. Our main goal is to study the drivers of risk averting/taking behavior, and compare our survey findings with those from laboratory research. A second goal is to present an original study that relates the importance of decisions with several factors such as frequency, domain, and group.

Adam Smith (1776, I.10, 29-34), in his book *The Wealth of Nations*, was among the first scholars to speculate about the factors that influence individuals' risk taking behavior. His findings were further developed by decision theorists, according to whom the magnitude of outcomes and their probabilities, together with stable risk preferences over outcomes, were the major factors that influence risk taking behavior (Keeney and Raiffa, 1976; Clemen, 1997). Behavioral decision theory has expanded the list of relevant drivers of risk attitudes. A major factor is framing (Kahneman and Tversky, 1979), followed by other aspects such as the domain of the decision (Hershey and Schoemaker 1980, 1994; March and Shapira, 1987), elicitation procedures (Schoemaker, 1990), the use of hypothetical versus real monetary payoffs (Camerer and Hogarth, 1999), differences between monetary and non-monetary consequences (Fagley and Miller, 1997), the affect experienced at the moment of decision making (Loewenstein, Weber, Hsee, and Welch, 2001), and individual-specific differences in risk taking behavior (Fong and Wyer, 2003).

Framing is important. People perceive outcomes as differences to some psychologically relevant point of reference, rather than absolute wealth levels (Markovitz, 1952; Edwards 1954; Kahneman and Tversky, 1979; Levin, Gaeth, and Schreiber, 2002). The reference point induces people to frame outcomes in terms of

losses (i.e., negative deviations from the status quo) or gains (i.e., positive deviations from the status quo), rather than final levels of wealth. Kahneman and Tversky (1979) argued that framing produces a reflection effect in risk-taking behavior. Outcomes framed as gains induce risk aversion, and outcomes framed as losses induce risk seeking behavior. This reflection effect has been validated by many studies (Abdellaoui, 2000; Baucells and Heukamp, 2004). Further, it has been found to be relevant in qualitative research on managerial risk taking (March and Shapira, 1987) and helpful in explaining some real-life economic paradoxes (Camerer, 2000). Closely related to framing is status quo or the alternative seen as the default alternative (Johnson and Goldstein, 2003). In experimental settings, framing, status quo and other factors are manipulated or induced. It is important to see if the effects of framing and status quo replicate in environments where those factors are not manipulated experimentally.

Factors other than framing may have psychological importance. For example, the significance of a decision's domain (professional vs. private, or other finer classifications such as investment, career, leisure, etc…) on risk taking behavior has been timidly explored. Domain, of course, is *a priori* more difficult to characterize than framing, which explains why framing effects are better understood than domain effects. Most of the available studies consider only a few possible, exogenously given, domains (Fagley and Miller, 1990; Rettinger and Hastie, 2001). Our study provides further evidence for the importance of domain in explaining risk attitudes.

Other approaches to the understanding of attitudes toward risk focused on individual differences such as aspects of personality and culture (Brockhaus, 1980; Douglas and Wildavsky, 1982; Hsee and Weber, 1999; and Fong and Wyer, 2003). The extent to which these aspects have an influence on risk attitudes requires further investigation.

A key assumption of behavioral research is that the insights obtained using monetary outcomes (hypothetical or real) will apply to non-monetary outcomes (Camerer and Hogarth, 1999). Fagley and Miller (1997) compared the way people make choices in decisions involving monetary as opposed to non-monetary (human life) outcomes and concluded that framing is independent of whether the outcomes are monetary or non-monetary. However, not much is known about the relationship between risk attitudes and the type of consequence (monetary, comfort, convenience, time) of a decision. Since in reality many decisions are non-monetary, or a combination of non-monetary and monetary outcomes, it is important to measure the influence, or lack of influence, of the type of consequence.

Kühberger, Schulte-Mecklenbeck, and Perner (2002) considered the importance of using hypothetical versus real payoffs. Most experiments have used hypothetical payoffs or real payoffs (e.g. Schoemaker 1990) of relatively small magnitude (exceptions are Binswarger, 1980; Beetsma and Schotman, 2001). Methodologically, surveying field decisions yields insights that are not as sharp as laboratory decisions. However, it has the advantage that the payoffs are not restricted to small amounts and, more importantly, subjects experience the actual consequences of their decisions.

In order to study these factors outside the laboratory, we approached three groups of subjects (undergraduates, MBAs and executives) and asked each of them to describe one recent real life decision. The description included qualitative dimensions (e.g., type of consequences, domain), quantitative dimensions (e.g., probability

estimates, monetary estimates of the magnitude of the consequences, frequency with which a decision is made) and subjective dimensions (framing and status quo). Finally, we asked our subjects to report their final choice (the safe or risky alternative).

Our main findings can be summarized as follows. We found, as expected, differences in the three groups for the types of consequences and domains of decisions. While MBA students and executives were more concerned with professional decisions involving monetary outcomes, undergraduates reported mostly private decisions with non-monetary outcomes. Interestingly, there were no group differences in framing and status quo, and, more importantly, no group differences in risk attitudes, as measured by the percentage of subjects that choose the risky alternative.

Using a binary logistic regression model, we were able to ascertain that risk prone behavior increases significantly when the safe alternative is perceived as a loss. Professional domain and the probability of success are two factors that increase the probability of taking risks. However, we found no significant difference between mixed and gains framing. Importantly, these conclusions hold irrespectively of whether the decision involves monetary or non-monetary outcomes.

Besides factors that influence risk attitude, other dimensions of the decision deserve consideration. We thus performed an analysis of the factors that predict the importance of a decision. It has been suggested that the cumulative effects of small and seemingly irrelevant decisions can be huge (Hogarth, 2001, p. 264; 2004, p. 32). Our analysis goes one step further by addressing the question: Are the cumulative effects of unimportant but frequent decisions greater than the cumulative effects of very important but infrequent decisions? Using stakes as a measure of the importance of a decision, we were able to give a positive answer to this question.

We found important group and domain differences: Executives make decisions that are six times more important than MBA students, who in turn face decisions that are twice as important as those made by undergraduates. Professional decisions are, on average, eight times more important than private decisions. Monetary decisions per se do not seem to be more important on average than other types of decisions.

We were not the first to study decisions outside the laboratory. Hogarth (2004), for example, studied the effect of feedback on confidence in everyday decision making. He used ESM (Experience Sampling Method), i.e., subjects were requested to fill a short questionnaire reporting a recent decision at random times of the day; subjects were alerted by mobile phone messages. Beetsma and Schotman's (2001) study using data from a television game show is another example. Massey (2004) studies risk behavior of employees by observing the timing of execution of their stock options.

The rest of the paper is organized as follows. Section 2 describes the survey design, discusses the measurement, and performs a preliminary data analysis. Section 3 explains the statistical results, including 1) an analysis of similarities and differences across the groups, 2) a logistic regression model analyzing the probability of making the risky choice, and 3) a linear regression model studying the importance of the decision. In Section 4 we discuss issues such as the relationship between status quo and reference points, the importance of daily versus yearly decisions, and other dimensions of a decision that influence risk attitudes. Section 5 concludes by relating our main findings with previous research.

2. Method

2.1 Subjects

We distributed a questionnaire to three groups of participants (see Appendix B). The first group consisted of 77 undergraduate students from Duke University. The second group was made up of 131 MBA students at IESE Business School in Barcelona, Spain. The third group consisted of 53 executives who were enrolled in the executive education program at IESE Business School. Table 1 summarizes the different demographical characteristics of the undergraduates, MBA students (MBAs) and executives (Executives).

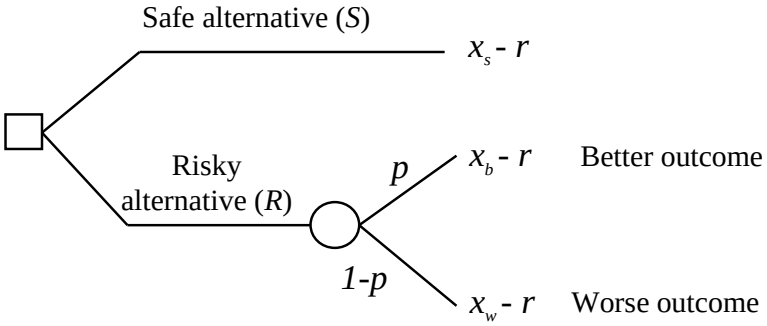
2.2 Survey Design

The questionnaire required subjects to describe a recent decision that involved two alternatives: a sure alternative S and a risky alternative R. Subjects were told to write down the outcome of the sure alternative. Next, we asked them to summarize the risky alternative in terms of two scenarios, a good luck scenario and a bad luck scenario, and describe their corresponding two outcomes, the "better outcome" and the "worse outcome", respectively.

Then, subjects were required to answer a number of questions which were intended to measure several dimensions of a decision. Some of those dimensions (e.g., p, $x_b - x_w$) correspond to the elements of a decision depicted in Figure 1, while others were meant to help us to further characterize a decision (e.g., domain, frequency).

Figure 1, not shown in the questionnaire but underlying its design, contains several dimensions of a risky decision. r is the reference point, x_s is the monetary outcome of the safe alternative (S), and $x_s - r$ is the perceived gain or loss associated with such outcome. Similarly, $x_b - r$ and $x_w - r$ with $x_b > x_w$ are the perceived gains or losses of the better and worse outcomes, respectively, of the risky alternative (R). Finally, p is the probability of the better outcome.

Figure 1. Decision Framework underlying the questionnaire.



The demand characteristics of the survey may create certain distortions or selection biases. For example, the fact that the subjects are young or professionally successful may explain why health related decisions were infrequent. More importantly, the request to think of a decision involving a risky alternative may induce subjects to think of a decision where they took the risky alternative, which explains the high overall percentage of risky choices (74%). However, the choice of *R* versus *S* is influenced by other factors, some of which we can identify with independence of this selection bias.

Because subjects had to retrieve from their memories a recent decision, the availability bias (Tversky and Kahneman, 1973) may distort the sample, making easily retrievable or available decisions appear more frequent than what they actually are.

Domain

Through the descriptions and explanations of the decisions and their corresponding outcomes, we classified the decisions into 17 mutually exclusive domains. These domains were later combined in two broad groups, named professional and private. The specific description of the way in which this classification was made is postponed to the next section.

Type of consequence

Early in the questionnaire, subjects were asked to classify the outcomes of their decisions according to one or more of the following seven categories: monetary, comfort (or discomfort), convenience, time (arriving on time or late, delays, waiting), social consequences (fame, embarrassment), career, and other.

Probability p

Direct scaling was used to measure the probability of success of the risky alternative, *p*. More precisely, subjects were presented with a linear scale between 0 and 1, with increments of 10%, and were requested to use a cross to indicate the

estimated probability that the better outcome would happen and then to write down this estimate in a place especially indicated.

Status quo

The status quo was given by the alternative that was perceived as a default alternative, i.e., the alternative that would be chosen if no action would be taken. To find the status quo, subjects were requested to decide whether in their decisions: 1) the safe alternative was the default alternative, or 2) the risky alternative was the default alternative, or 3) neither alternative was the default due to the fact that both alternatives required taking some action.

Frequency

Subjects were asked to estimate the number of decisions of similar importance to the one described in the questionnaire that they would make in a given period – day, week, month, year and life. The answers were then converted into yearly units, that is, number of decisions per year. For instance, the answer of "6 decisions per day" was converted into 6*365 = 2190 decisions per year, "5 decisions per month" into 5*12= 60 decisions per year, while "3 decisions in life" was assumed to be 3/50 = 0.06 decisions per year.

Valuation of the outcomes

In order to have a quantitative measure of the consequences, we requested the subjects to provide monetary estimates of the outcomes. Thus, subjects were asked to imagine that they had chosen the risky alternative and the worse outcome had happened. In this case, they had to provide us with their willingness to pay to replace: 1) the worse outcome with the better outcome, and 2) the worse outcome with the sure outcome. This information provided us with the differences: x_b-x_w and x_s-x_w. As a double check, subjects were asked to provide us with their willingness to pay to move from the sure to the better outcome given that they had previously chosen the safe alternative. Their answers provided us with values for x_b-x_s and x_s-x_w, which were thought to add up to the previous estimate of x_b-x_w[1]. We will explain in the next section how we combined these estimates, and used them to calculate a measure of importance called *stakes*.

The attractiveness of the safe alternative q

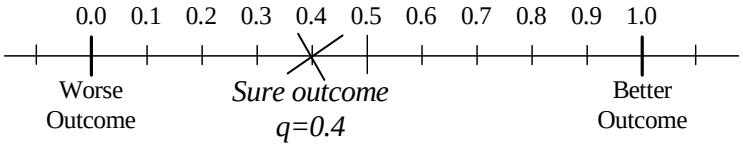
Given the description of a decision, a risk neutral decision maker would be indifferent between both the safe and risky alternatives whenever $p = (x_s\text{-}x_w)/(x_b\text{-}x_w)$. We define $q = (x_s\text{-}x_w)/(x_b\text{-}x_w)$ as the *attractiveness of the safe alternative*, which gives the position of the sure outcome relative to the better and worse outcomes. For non-trivial decisions q takes values from *0* to *1*. Notice that a risk neutral decision maker

[1] Undergraduates expressed these values in dollars, whereas MBAs and Executives responded in euros. Exchange rates between these two currencies were around one while data was collected, and we use euros as the unit of monetary measure.

would prefer the risky outcome if and only if $p \geq q$. This observation is easily seen when $r = x_w$, in which case the expected values of *S* and *R* are $q(x_b - x_w)$ and $p(x_b - x_w)$, respectively.

We elicited *q* using a graphical approach. Specifically, subjects were presented with a scaled line as in Figure 2, and asked to estimate the location of the sure outcome with respect to the worse and better outcomes in terms of their preferences[2].

Figure 2. Scale to locate the sure outcome with respect to the better and worse outcomes.



Framing

Framing is related to the locus of the reference point *r* relative to the outcomes, yielding a perception of either gains or losses for each outcome. Overall, the decision can be perceived as all-gains, all-losses, or mixed. We asked subjects whether they perceived the sure outcome as a gain, a loss, or neutral (neither gains nor losses) by ticking one of three check boxes. The framing of the decision was described as *gains* for those subjects reporting the sure outcome to be a gain, *losses* if the sure outcome was perceived as a loss, and *mixed* if the sure outcome was perceived as neutral. As a consistency check, we also asked the subject to classify as gain, loss or neutral the two outcomes of *R*. We eliminated from the analysis of framing 17 cases that showed some inconsistency. For example, if the safe alternative was perceived as neutral, then the better outcome could not be perceived as a loss, nor the worse outcome be perceived as a gain. This left us with 244 valid answers out of 261.

Final choice

Subjects were asked to write down whether they had chosen the safe or the risky alternative. Combining this answer with other dimensions such as framing and probability p would provide the necessary information to evaluate the subjects' risk attitudes.

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[2] It is also possible to estimate *q* using the monetary valuations of the outcomes. In fact, the following three ratios $(x_s - x_w)/(x_b - x_w)$, $(x_s - x_w)/((x_b - x_s) + (x_s - x_w))$, and $1 - (x_b - x_s)/(x_b - x_w)$, provide estimates of *q*. If we take the median of these three numbers, and compare this median with the scale estimate of *q*, we find a correlation of 0.56. While this number is somewhat low, our results do not change significantly when using either measure, and we decided to use the scale estimate of *q*.

2.3 Preliminary data analysis

In order to describe and analyze the results of the survey, the responses to some of the questions were coded. In what follows, we first explain the way we encoded the variable domain. Next, we define the *stakes*, which is a measure of the importance of the decision. Finally, we describe how we encoded other dimensions.

Encoding of the domain

The domain of the decisions reported by the subjects was assessed using the open-ended question (see elicitation of simple decisions) described in the methods section. In other words, subjects were not asked to pigeon-hole their decision in a particular domain, but to describe in words their decisions. In order to classify the decisions into domains, the authors identified 17 domains, as shown in Table 2. The 17 domains were combined in two broad categories: professional and private. The professional decisions were composed of: business, start MBA, human resources, job, protocol, and studying. The rest of domains were labeled as *private* decisions. The two authors independently ascribed each decision to exactly one domain. A handful of decisions were classified differently by the two authors. After discussing those cases, an agreement was reached, which in many cases clarified the definition of the different domains.

Stakes or importance of the decision

Intuitively, the importance of a decision is related to the difference between the better and the worse outcome, $x_b - x_w$, of the risky alternative, as well as the probability of obtaining the better outcome. For example, the decision reported by one of the subjects of whether to cycle with helmet (*S*) or not (*R*), has "No accident" as the better outcome, and "accident + head injury" as the worse outcome. While the difference between the better and worse outcome is large, suggesting a high importance of the decisions, the low probability of an accident rightly classifies this decision as of moderate importance. The standard deviation of a binary lottery, given by $(x_b - x_w) \cdot \sqrt{p(1-p)}$, takes into account the range of consequences, and it decreases as *p* approaches *0* or *1*. For easiness of interpretation, we define the stakes (our measure of the importance of a decision) as twice the standard deviation of the risky alternative:

$$\text{STAKES} = 2 \cdot (x_b - x_w) \cdot \sqrt{p(1-p)}$$

The advantage of this measure is that if $p = 0.5$, then *STAKES* coincides with the range of outcomes of the risky alternative. A decision with $p = 0.2$ and $x_b - x_w = 100$ has stakes equal to *80*, which is equivalent to a decision with $p = 0.5$ and $x_b - x_w = 80$. Both decisions have a standard deviation of *40*. Conversely, a decision with stakes equal to *80* can correspond to a p=*20%* decision with $x_b - x_w = 100$, or a p=90% decision with $x_b - x_w = 133.3$; or a p=*50%* decision having $x_b - x_w = 80$. We suggest that the reader adopt this latter, more intuitive, interpretation of stakes.

In our survey, we asked directly for a monetary estimate of $x_b - x_w$, but we also asked for monetary estimates of $x_b - x_s$ and $x_s - x_w$, whose sum is an indirect

estimate of $x_b - x_w$. Although exact agreement between these two measures occurs in less than half of the cases, both estimates have the same order of magnitude, and the correlation between $Ln(x_b - x_w)$ and $Ln((x_b - x_s) + (x_s - x_w))$ is *0.95*. We average these two logarithms to obtain a final estimate of $\hat{x}_b - \hat{x}_w$, i.e., use the geometric mean of the direct and indirect estimates.[3] Combining $\hat{x}_b - \hat{x}_w$ with p yields the stakes.

Encoding of the other dimensions

Except for the numerical dimensions, the others were coded as binary variables. The notation "D_" preceding a variable indicates its binary nature. Because multiple choices in the type of consequences were allowed, we constructed 7 binary variables, one for each type of consequence.

3. Results

The analysis and presentation of the results is divided into three parts. In sub-section 3.1, we present an overview of similarities and differences across the three groups with respect to several dimensions. We complement this qualitative analysis with the investigation of the relationships between some dimensions. Sub-section 3.2 examines the influence of framing, status quo, and other variables on the final choice by means of a logistic regression model. In sub-section 3.3, we develop a linear regression model having the importance of a decision as the dependent variable. The predictors are various dimensions of the decisions.

3.1 Overall picture and group analysis

Types of consequences and domain

Figure 3 presents the percentages for the types of consequences for the three groups. Given that most experiments are done using monetary rewards, we are interested in how many decisions of our survey involve monetary or non-monetary consequences. Clearly, aspects other than monetary are involved in most decisions: only 11 decisions out of 261 were exclusively monetary, while 37% of decisions were entirely non-monetary.

Furthermore, MBAs and Executives reported that money was involved in more than 70% of their decisions, whereas Undergraduates' decisions with monetary consequences accounted for only 35%. The pattern for MBAs and Executives is strikingly similar in all the categories (p-value of χ^2 global independence test equals 0.993). While MBAs and Executives deal primarily with money, followed by career and comfort, Undergraduates seem to face consequences related to comfort, socializing, and career. Younger people seem mainly concerned with decisions involving their free

[3] There were two outliers exhibiting large differences in the order of magnitude of the two estimates. We inspected these decisions and chose the more reasonable of the two values. For this analysis, we also ruled out those subjects who reported zero values. Five subjects reported that $(x_b - x_w)$ was "everything they could" or "infinite." Since these answers were not quantifiable, we ruled them out, too.

time. As they start taking new responsibilities, social and comfort are replaced by monetary aspects. Career and convenience seem to have a constant presence in people's decisions for many years of their lives.

Figure 3. Type of consequences faced by the three groups

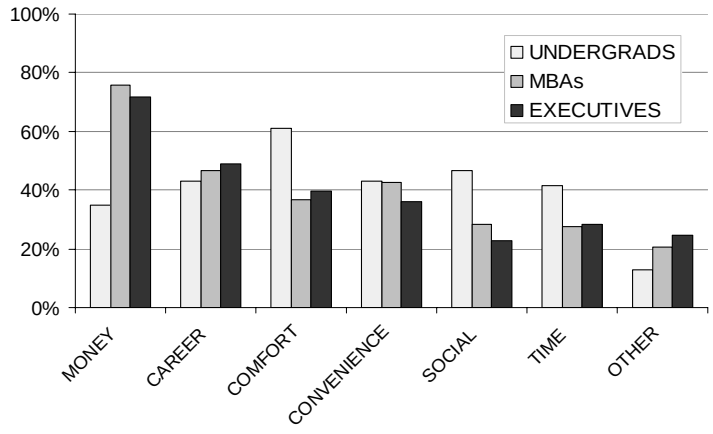


Table 2 reveals that the three groups differ on the domains. As expected, Executives reported mostly professional decisions (with an emphasis on business, human resources, and job), most Undergraduates' decisions were in the private domain (organization, safety, and ethics), and MBAs' decisions seem to be more balanced between the two domains.

p, q, Framing, Status quo, and Final Choice

We calculated the percentages of responses for each of these dimensions and used a z-test to evaluate the differences in percentages among the three groups: Undergraduates, MBAs and Executives. There were no significant differences in percentages among the three groups for all these dimensions. This allowed us to aggregate the data and perform the subsequent analysis for the overall percentages (see Table 3).

The aggregate data suggest that, on average, subjects are optimistic regarding the probability of success ($\overline{p} = 62\%$). On average, the sure outcome is also closer to the better outcome than to the worse outcome ($\overline{q} = 57\%$). The fact that $\overline{p} > \overline{q}$ implies that the "average" risky alternative has a slight advantage in terms of expected value. The difference between $\overline{p}$ and $\overline{q}$ is statistically significant (t-value = 2.916, p-value = 0.0037) and subjects seem to respond to this advantage by taking the risky option in 74% of the cases. However, this percentage seems to be quite high. Therefore, in subsection 3.3, we study more in depth the factors that drive the choice of the risky option.

Our analysis of framing confirms that almost half of the decisions (47%) are perceived as mixed, i.e., the reference point coincides with the outcome of the safe alternative. In 25% of the cases the safe alternative is perceived as a sure gain, whereas in 28% of the decisions the sure outcome is viewed as locking into a loss. Paradoxically, mixed gambles involving both gains and losses are empirically less understood than all-gains or all-losses gambles (Luce 2000, Wu 2004; Wu and Markle, 2004).

Finally, in 55% of the decisions the status quo is the default option. Both decisions are perceived as proactive in 30% of the cases, and in the remaining 15% the risky decision is the default. The percentage of "Safe is default" seems higher for Executives, but a p-value=0.074 of the χ^2-test reveals that there is no reason to reject the null hypothesis of independence between groups and the status quo.

Other cross analyses such as a possible relationship between framing and the types of consequences failed to find significant relationships. As will be discussed later, no differences between monetary and non-monetary decisions were found.

3.2 Factors that influence risk-taking propensity

What are the drivers behind the choice of the risky or the safe alternative? In the tradition of decision analysis, rational decision makers would base their decisions primarily on the probability p of the better outcome and the attractiveness q of the safe alternative. A risk neutral decision maker, for instance, would choose the risky alternative if and only if $p \geq q$. This rational decision maker might not be risk neutral. One may conjecture that the higher the stakes the lower the probability of choosing the risky alternative due to risk aversion. Other factors such as framing, status quo, and gender are not supposed to have an influence. In what follows, we investigate these suppositions.

We first explore how the Risky/Safe choice might depend on domain, framing, status quo, and type of consequence (Table 4). Overall, 74% of decisions resulted in the choice of the risky alternative.

The relationship between the final decision and domain seems quite strong. Most of the professional decisions resulted in the Risky choice (88%), whereas subjects seemed to be more cautious in the private domain (62% of Risky choices). Table 2 shows the percentage of Risky/Safe choices on the specific domains. We observe a clear "selection bias" associated with Start MBA: our sample contains precisely those subjects that have chosen the risky option. Decisions in the professional domains, such as Business and Human resources, resulted in the Risky choice quite often. Note that in these two domains the decisions are taken on behalf of a corporation. A risky behavior here is in agreement with decision theory, which ascribes a larger risk tolerance to corporations than to individuals. Buy/Sell is the domain with the lowest rates of risk-taking behavior. Subjects seem to take many precautions in changing suppliers. Organization (which refers to everyday arrangements), Personal Investment, and Traveling also seems to be associated with the Safe choice. The Risky choice is more frequent than the Safe choice in all the other domains.

We observe the influence of framing in the percentage of risky choices, which increases as we move from gains (52%), to mixed (74%), and to losses (92%) framing.

This is clear evidence that framing has an influence on risk-taking behavior outside the laboratory.

The influence of the status quo is somewhat puzzling: the percentage of risky choices increases when the safe alternative is perceived as default. There is not much difference between the cases where the default is the risky alternative and where both alternatives were proactive.

Finally, the type of consequence (monetary or not) does not seem to have any impact on risk attitudes.

To get a better understanding of our data, we fit a binary logistic regression to predict the final choice (D_RISKY=1 if the risky choice was made, and 0 otherwise). The independent variables are: the dummy for the domain (D_PROFESSIONAL), the two dummies for framing (D_LOSS and D_GAIN), $Ln(p/(1-p))$, and $Ln(q/(1-q))$, the odds ratio corresponding to *p* and *q*. Table 5 summarizes the results, which yields the following prediction for the odds ratio of taking the risky choice:

$$\frac{\Pr(Risky)}{1-\Pr(Risky)} = e^{Bx} = 1.19\left(\frac{p}{1-p}\right)^{1.18}\left(\frac{1-q}{q}\right)^{0.3} e^{1.14D\_PROFESSIONAL+1.19D\_LOSS-0.42D\_GAIN}$$

This model leads to interesting insights. It predicts that the probability of choosing the risky alternative should increase with *p* and decrease with *q*. The odds ratio of the predicted choice increases in direct proportion with $p/(1-p)$. In fact, the coefficient of 1.18 associated to $p/(1-p)$ is not significantly different from one. Pr(Risky) decreases with *q*, but the coefficient *-0.3* indicates that subjects are less sensitive to *q* than they are to *p*.

Framing has a strong influence on the final choice. Specifically, the odds ratio associated to making the Risky choice is multiplied by 3.3 [=exp(1.19)] whenever the sure outcome is perceived as a loss (as opposed to mixed). This prediction is in agreement with Prospect Theory, which proposes risk seeking behavior for losses. Gain framing is not significantly different from mixed framing. If anything, the negative sign of the coefficient associated with D_GAIN suggests that subjects are more risk averse in all-gains gambles than in mixed gambles. This does not contradict Prospect Theory, which exhibits risk averse behavior for both gains and mixed gambles of moderate probability.

Surprisingly, subjects seem to take more risks in professional decisions than in private decisions. The odds ratio of taking the Risky choice is multiplied by 3.1 if the decision is professional as opposed to private. We checked for possible Start MBA selection bias (our sample contains precisely those subjects that have chosen the risky option) by removing those decisions and found a similar effect of D_PROFESSIONAL (the factor is now 2.96 instead of 3.1, p-value = 0.049).

Table 6 presents the prediction of choosing the risky alternative. We tried two scenarios, the first with *p=q=0.5*, and the second with *p=0.25* and *q=0.5*. The six entries show the probabilities for three framings and two domains. This table uses a simplified model where all the non-significant variables (except for *q*) have been omitted. Both domain and loss framing increase Pr(D_RISKY). The probability of

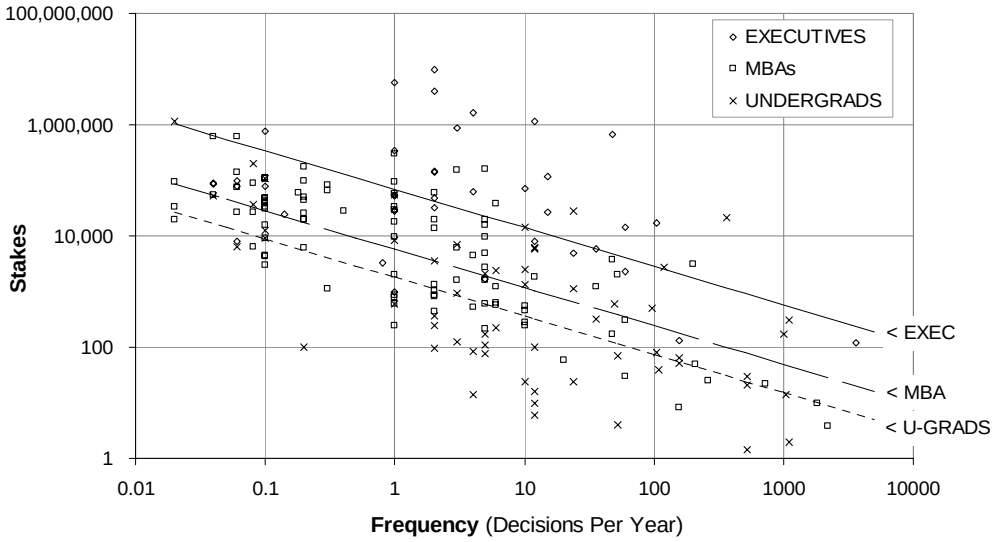
choosing the Risky option in a private decision perceived as mixed was of 54%. This probability increases to 80% for a private decision with a loss framing. The odds ratio moves from 1.19=0.54/0.46 to 3.9=0.8/0.2. This is the increase by a factor of 3.295 associated with exp(B_{D_LOSS}). The probability of making the Risky choice is 79% if the domain is professional, an increase in the odds ratio of 3.121=exp($B_{D\_PROFESSIONAL}$).

When *p=0.25* and *q=0.5*, a risk neutral person would choose the safe alternative. In fact, our subjects chose the Risky alternative less than half of the time, except for decisions perceived as losses, where the probability of choosing the Risky option is 52% and 77%, respectively, for private and professional decisions.

3.3 Analyzing the importance of the decisions

We now proceed with the analysis of the dimensions of a decision that influence its importance as given by the stakes. Our first concern is with the examination of a possible relationship between the frequency of a decision and its importance as measured by the stakes. Visual inspection of Figure 4 points to a linear relationship between the log of the stakes and the log of the frequency. Different marks for different subject groups are used and the three regression lines, one for each group, are drawn. These lines suggest that stakes increase as one moves from Undergraduates to MBAs and Executives.

Figure 4. Relationship between the stakes and the frequency of the decision.



To further explore the relationship between the stakes of a decision and its dimensions, we employed a linear regression. We regressed the log of the stakes onto the main variable given by the log of the frequency, a control variable (D_PROFESSIONAL) indicating whether the decision was in this domain, and two dummies for groups. Taking MBAs as the reference group, we included the dummy variables controlling for the other two groups (D_UNDERGRAD and

D_EXECUTIVE). Before running the regression, we eliminated from our analysis those observations that had missing values in either stakes or frequency variables. In this way, we were left with 191 observations. Table 7 reports the results of this analysis.[4] All the dependent variables exerted a significant effect on stakes.

Table 8 uses the model in Table 7 to estimate daily and yearly median stakes for the private and professional decisions for the three groups. For instance, the median stakes of a yearly decision of an MBA student on a private domain are of 2555 euros. As expected, frequency exhibited a negative relationship with the stakes, meaning that those decisions that are more frequent involve smaller stakes and thus are less important. Specifically, the median stakes decrease at a rate that is inversely proportional to the frequency to the power of 0.55. For example, the median stakes of a daily private decision of an MBA student are of $2555 \cdot 365^{-0.55} = 102$ euros.

A regression coefficient of -.86 for D_UNDERGRAD indicates that the median stakes for the Undergraduates are 0.4 times those of the MBAs. Thus, the median stakes of a daily private decision of an undergraduate is of 43 euros, whereas the median stakes of a yearly private decision is of 1083 euros. Similarly, the regression coefficient D_EXECUTIVE indicates that the median stakes for the Executives is 6.1 times higher than that of the MBAs. In total, Executives face decisions that are 14.4 times more important than those of Undergraduates. The median stakes of a daily private decision of an executive is of 626 euros, whereas the median stakes of a yearly private decision is of 15653 euros.

Domain has an important influence on the importance of a decision. A professional domain increases the stakes by a factor of 7.5 relative to a private domain. Thus, the median stakes of a yearly professional decision moves from 2555 to 19276 in the case of an MBA student. For Undergraduates and Executives, the median stakes of a yearly professional decision is of 8173 euros and 118097 euros, respectively.

Importance of the specific domains

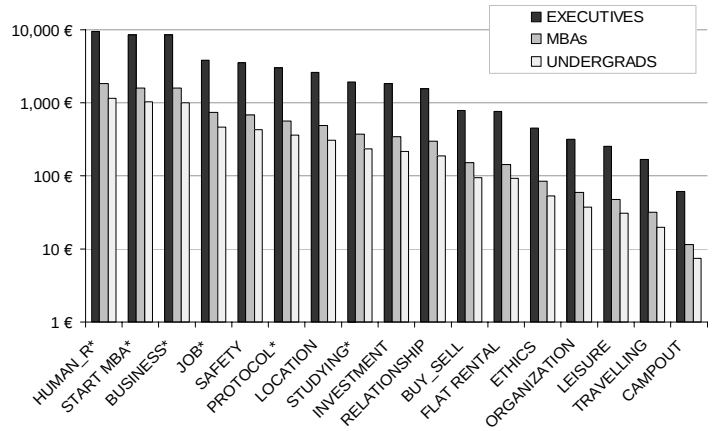
We modified the previous regression and replaced D_PROFESSIONAL with the dummies for all the specific domains except for one (we selected Campout as the reference domain). The coefficients of these dummy variables now indicate the importance of decision by domain. The slopes of all domains were statistically significant except for Leisure and Traveling. Using this model, Figure 5 presents the prediction of the median stakes of yearly decisions (Frequency = 1) for the three groups and the different domains.

In general, professional decisions have the highest importance. However, a few private domains, namely Safety, Location and Investment, are of higher importance than some private domains such as Studying and Protocol. The logarithmic scale is important: business decisions are 2.4 (=138/58) times more important than Safety decisions, which in turn are 4.5 (=58/12.8) times more important than Buy/Sell

[4] We tried an extended model with the variables D_MALE, D_MONEY, D_GAIN, D_LOSS, or D_SAFE_DEFAULT, which failed to be significant. In this extended model, the coefficients for the current variables were similar, except for D_UNDERGRAD, which was not significant.

decisions. Finally, Buy/Sell decisions are 3 (=12.8/4.1) times more important than Leisure decisions.

Figure 5. Median stakes of yearly decisions associated with different domains.



4. Discussion

Aggregated importance of daily decisions versus yearly decisions

The study of small daily decisions has received attention recently. For instance, Erev and colleagues studied the effect of economic incentives on small but consequential repeated decisions. Examples are running red lights (Perry, Erev, and Haruvy, 2000), selecting routes (Erev, Barron, and Remington, 2001), and shopping. Interestingly, most of the small but frequent decisions in our survey are also related to shopping and driving (routes, parking).

One may wonder if the cumulative impact of these small but frequent decisions amount to more than the cumulative impact of very important but less frequent decisions (career changes, moving to a new city, etc…). Our linear regression model is able to shed light on this question. Initially, assume that, each year, a person makes 365 daily decisions and 1 yearly decision. Then, the cumulative stakes involved in daily decisions become 365 times the stakes of 1 daily decision. We want to compare this number with the stakes of 1 yearly decision. Using the model in Table 7 for an MBA student, we see that the cumulative effect of daily decisions is given by

$$37282 = 365 \cdot 2555 / 365^{b_f} = 2555 \cdot 365^{(1-b_f)},$$

where $b_f = 0.55$ is the coefficient associated with *Ln(Freq)* obtained in the regression. Of course, $b_f \geq 0$ implies an inverse relationship between importance and frequency. The 37282 euros in stakes of 365 daily decisions has to be compared with 2555 euros of 1 yearly decision. Thus, the accumulation of daily decisions is 14.6 times higher than

one typical yearly decision. This conclusion holds as well for the Undergraduates and Executives, due to the multiplicative nature of the model.

Notice that this comparison hinges on whether $365^{(1-b_f)}$ is increasing or not. This, of course, depends on whether b_f is smaller than 1 or not. In our case, $b_f = 0.55 < 1$ implies that $365^{0.45}$ is greater than 1; thus, daily decisions (*Freq* = 365) will have higher cumulative effects than yearly decisions (*Freq* =1).

More in general, if $b_f < 1$ and $Freq_1 > Freq_2$, then the cumulative effects of $Freq_1$-type decisions are higher than the cumulative effects of $Freq_2$-type decisions. Conversely, if $b_f > 1$, then the stakes diminish very rapidly with frequency: Important but infrequent decisions have higher cumulative effects. Because the 95% confidence interval for b_f is $[0.43, 0.66]$, our data yields clear support for $b_f \leq 1$. These observations also hold if one makes 10 daily decisions and 10 yearly decisions. However, if the number of decisions of each frequency-type are different, then the appropriate adjustments have to be made.[5]

Status quo, type of consequences, and group are unrelated to risk attitudes

We have already seen that framing matters for risky choice. However, do other factors such as group and monetary consequences matter? In Table 9 we present an expanded logistic regression model. We have not included Ln(Stakes) because it reduces the number of observations from 212 to 160, and, once included, turns out not to be significant. The same can be said for Gender. Besides confirming that the coefficients of the variables in Table 6 are stable, we find no other significant factors. Specifically, once we account, the status-quo variable (D_SAFE_DEFAULT= 1 if safe is the default, 0 otherwise) has no significant influence on the final decision.

Table 4 suggests that the presence of monetary consequences does not help in predicting the final choice. This remark is confirmed by the fact that the variable D_MONEY, which distinguishes monetary from non-monetary decisions, is not significant (see Table 9). The variables D_COMFORT, …, D_CAREER do not have a significant influence once we account for framing and domain. This finding is encouraging: it reveals that the insights obtained in laboratory experiments using monetary consequences can be extended to other types of consequences. Thus, while we confirm that domain of the decision influences risk attitudes, we find evidence that the type of consequence (monetary, time, comfort, etc…) has little or no influence on risk attitudes.

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[5] In this case, one could let $n(Freq)$ be the number of decisions of this given frequency that one person makes per year. For example, $n(365) = 730$ corresponds to making 730 decisions per year of daily importance ($Freq_1$= 365), i.e., an average of two daily-type decisions per day; and $n(1) = 3$ indicates 3 yearly-type decisions ($Freq_2$=1) per year. The critical ratio to support the conclusion that $Freq_1$-type decisions amount to more than $Freq_2$-type decisions is:

$$n(Freq_1) \cdot Stakes(Freq_1) \geq n(Freq_2) \cdot Stakes(Freq_2),$$

which, using our regression model, becomes $n(Freq_1) / n(Freq_2) \geq (Freq_1 / Freq_2)^{b_f}$.

Finally, the fact that the variables controlling for group are not significant implies that risk attitudes do not vary across our three groups. This is reassuring, showing that experiments performed with Undergraduates or MBAs can be extrapolated to other groups such as Executives.

Status quo and reference points

In a series of experiments, Samuelson and Zeckhauser (1988) showed an exaggerated preference for the status quo (what is implemented if nothing is done), which they justified using loss aversion. Johnson, Hershey, Meszaros and Kunreuther (1993) showed this status quo bias with field data on insurance choices. The link between loss aversion and status quo assumes that the status quo outcome and the reference point are identical. While this identification can be easily induced in artificial laboratory experiments, we want to verify whether our survey data supports this assumption.

Table 10 shows the relationship between the status quo and framing. As argued previously, the Safe alternative tends to become the reference point (49%). This percentage increases to 54% if the Safe alternative is the default, and decreases to 42% if not. While status quo is related to framing (χ^2-test yields a p-value= 0.000071), a change from 42% to 54% suggest that the link between the status quo and reference point is not as strong as one may think. Moreover, the data in Table 4 squarely contradict the status quo bias: when the Safe alternative is the default, 81% of the subjects chose the Risky option, whereas when the Safe is not the default, only 64% chose Risky.

While we observe that the status quo has some influence in setting the framing of a decision, we confirm that framing, and not status quo, is the driver of the risk attitude. In fact, the variable D_SAFE_DEFAULT is not significant in the expanded logistic regression model of Table 9. Thus, the influence of the status quo on risk attitude is indirect in nature and, in our study, not significant. This finding suggests that the reported attractiveness of the default options (Johnson and Goldstein, 2003) might be driven by factors other than loss aversion.

5. Final Remarks

Previous empirical studies on attitudes toward risk that are relevant to our study include Hershey and Schoemaker (1980, 1984), MacCrimmon and Wehrung (1986) and March and Shapira (1987). These studies provide empirical evidence on how managers define risk, their attitudes toward risk, and how they deal with risks. Regarding attitudes toward risk –the issue that we also consider– some of our results can be seen as a confirmation of theirs. Our results support and extend the findings of both MacCrimmon and Wehrung (1986) and March and Shapira (1987), who studied the case of managers. As did they, we found strong evidence for framing. However, we are unable to observe interactions between framing and stakes (March and Shapira, 1986; Kühberger *et al.*, 2002; MacCrimmon and Wehrung, 1986). This confirms that framing effects occur in both actual and hypothetical choices (Kühberger *et al.*, 2002).

The influence of the content domain of a decision problem on the outcome of the decision has been investigated by Rettinger and Hastie (2001). In their experiment, subjects exhibited differences in risk attitudes on the four content domains considered: gamble, stock, grade (school) and legal. For instance, subjects were risk averse in the gamble scenario and risk seeking in the stock scenario, whereas on the other two domains the risk attitudes were more evenly distributed. We push forward their investigation by illustrating that domain, together with framing, is a psychologically relevant factor in risk attitude. While framing has received lots of attention, domain has been relatively unexplored.

Fagley and Miller (1990) looked at gender differences in choices in decision problems involving outcomes such as human life or death, dropping out of school and job loss. Their findings confirmed the prospect theoretical predictions regarding the framing effects for women but not for men, regardless of the domain of the decision and the risk propensity of the subjects. We find no gender differences in that both groups are sensitive to framing effects.

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Appendix A - Tables

Table 1: Characteristics of subjects.

	UNDERGRAD		**MBAs**		**EXECUTIVES**		**TOTAL**	
N	77		131		53		261	
Median age	24.5		28		36		28	
Country	86% USA		30 diff. countries		91% Spain			
GENDER	#	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Female	35	45 %	36	27 %	2	4%	73	28 %
Male	42	55 %	95	73 %	51	96 %	188	72 %

Table 2: Domain of the decisions for the different groups.

		UNDER GRADS	MBAs	EXECU TIVES	TOTAL	% Risky
PROFESSIONAL	HUMAN RESOURCES (assignment of tasks, choose collaborators, organizing subordinates)	-	-	19%	**4%**	100%
	START MBA (keep current job or start MBA)	-	29%	-	**15%**	94%
	BUSINESS (decisions made in the current job)	-	2%	28%	**7%**	73%
	JOB (change job or not)	4%	8%	30%	**11%**	88%
	PROTOCOL (how to deal with superiors[6])	5%	2%	4%	**3%**	83%
	STUDYING (continue education or not)	12%	2%	-	**5%**	73%
PRIVATE	SAFETY (undertake laser eye surgery, driving after drinking, wear helmet)	12%	2%	-	**4%**	90%
	LOCATION (move to another city/country or not)	6%	3%	2%	**4%**	50%
	INVESTMENT (investing personal wealth)	-	7%	2%	**4%**	70%
	RELATIONSHIP (continue/start or not a relationship)	6%	3%	2%	**4%**	37%
	BUY_SELL (whether to buy/sell something and choice of supplier)	6%	10%	2%	**7%**	79%
	FLAT RENTAL (rent a flat or wait for other opportunities)	-	11%	2%	**6%**	75%
	ETHICS (tell the truth, break the law)	8%	-	-	**2%**	48%
	ORGANIZATION (planning of activities, scheduling, do now/do later)	16%	13%	6%	**12%**	77%
	LEISURE (entertainment activities and sports[7])	6%	6%	-	**5%**	57%
	TRAVELLING (traveling/vacation decisions)	3%	2%	4%	**3%**	73%
	CAMPOUT (campout or do something else[8])	16%	-	-	**5%**	80%

[6] Examples of protocol are "to attend dinner after the interview / not attend", or "abide with supervisor / confront him".
[7] Since our questionnaire asked subjects to recall a risky decision, a few of them reported leisure decisions involving risky sports like sky diving or paddling in the open ocean.
[8] Several undergraduates had participated in a campout activity just before filling out the questionnaire. This is reflected in their answers, with 12 out of 77 subjects reporting Campout related decisions.

Table 3: Final choice, framing, and status quo for the different groups.

	UNDERGRADS	MBAs	EXECUTIVES	TOTAL
Avg. Probability **p**	**61%**	**63%**	**59%**	**62%**
Avg. Attractiveness **q**	**60%**	**55%**	**55%**	**57%**
FINAL CHOICE				
RISKY	69%	76%	75%	**74%**
SAFE	31%	24%	25%	**26%**
FRAMING				
GAIN	29%	24%	21%	**25%**
NEUTRAL	51%	41%	55%	**47%**
LOSS	20%	35%	25%	**28%**
STATUS QUO				
SAFE DEFAULT	47%	57%	62%	**55%**
BOTH PROACTIVE	32%	28%	34%	**30%**
RISKY DEFAULT	21%	15%	4%	**15%**

Table 4: Cross analysis for the final choice (Risky or Safe) with domain, framing and status quo.

	RISKY	**SAFE**
TOTAL	74%	26%
DOMAIN		
PRIVATE	62%	38%
PROFESSIONAL	88%	12%
FRAMING		
GAIN	52%	48%
NEUTRAL	74%	26%
LOSS	92%	8%
STATUS QUO		
SAFE DEFAULT	81%	19%
SAFE NOT DEFAULT	64%	36%
MONEY		
MONETARY	74%	26%
NON-MONETARY	73%	27%

Table 5. Logistic regression model predicting the probability of making the Risky choice as a function of domain and framing.

Pr(D_RISKY)	B	p-value	Exp(B)
Ln(p/(1-p))	1.179	2E-07	-
Ln(q/(1-q))	-0.295	0.1685	-
D_PROFESSIONAL	1.138	0.0111	3.121
D_LOSS	1.193	0.0368	3.295
D_GAIN	-0.425	0.3775	0.654
Constant	0.176	0.5706	1.193

N=212; Nagelkerke R^2 = 0.434; Overall correctly classified = 0.802.

Table 6. Probability of making the Risky choice as a function of domain and framing. Prediction calculated using the logistic regression model of Table 9.

Pr(D_RISKY)	**GAIN** (×0.65)	**NEUTRAL** (=1)	**LOSS** (×3.3)
p = 0.5; q = 0.5			
PRIVATE (=1)	44%	54%	80%
PROFESSIONAL (×3.1)	71%	79%	92%
p = 0.25; q =0.5			
PRIVATE (=1)	18%	25%	52%
PROFESSIONAL (×3.1)	40%	50%	77%

Table 7. Regression results for Ln(STAKES) as a function of the Ln(FREQUENCY), the groups (D_UNDEGRAD, D_EXECUTIVE), and the broad domain (D_PROFESSIONAL).

Ln(STAKES)	**B**	**p-value**	**Exp(B)**
(Constant)	7.846	0.000	2555.0
LN(FREQUENCY)	-0.546	0.000	-
D_UNDERGRAD	-0.858	0.011	0.42
D_EXECUTIVE	1.813	0.000	6.13
D_PROFESSIONAL	2.021	0.000	7.54

N=191; $R^2 = 0.644$

Undoing the log transformation yields the median prediction:

$$\text{STAKES} = \frac{2555 \cdot e^{-0.86 \cdot D\_\text{UNDERGRAD}} e^{1.81 \cdot D\_\text{EXECUTIVE}} e^{2.02 \cdot D\_\text{PROFESSIONAL}}}{\text{FREQUENCY}^{0.55}}$$

Table 8. Prediction of the median stakes (in euros) of a decision taken by different subjects on either private or professional domains. Daily decisions (Freq.=365) are compared with yearly decisions (Freq.=1). Predictions are done using the model of Table 6.

	UNDERGRADS	**MBAs**	**EXECUTIVES**
DAILY ($\times 365^{-0.55} = 0.04$)	(×0.42)	(=1)	(×6.1)
PRIVATE (=1)	43 €	102 €	626 €
PROFESSIONAL (×7.5)	327 €	771 €	4,721 €
YEARLY ($\times Freq^{-0.55} = 1$)			
PRIVATE	1,083 €	2,555 €	15,653 €
PROFESSIONAL	8,173 €	19,276 €	118,097 €

Table 9. Expanded logistic regression model predicting the probability of making the Risky choice.

Pr(D_RISKY)	**B**	**p-value**	**Exp(B)**
Ln (p/(1-p))	**1.184**	**4E-07**	-
Ln (q/(1-q))	-0.312	0.1572	-
D_PROFESSIONAL	**1.425**	**0.0073**	**4.156**
D_LOSS	**1.127**	**0.0537**	**3.087**
D_GAIN	-0.430	0.3911	0.651
D_SAFE_DEFAULT	0.172	0.6786	1.188
D_MONEY	-0.159	0.7308	0.853
D_EXECUTIVE	-0.653	0.247	0.520
D_UNDERGRAD	0.144	0.7838	1.155
Constant	0.220	0.699	1.246

N=212; Nagelkerke $R^2 = 0.446$; Overall correctly classified = 0.807

Table 10: Cross analysis of framing and status quo.

	SAFE IS DEFAULT	SAFE IS NOT DEFAULT	TOTAL
N	134	108	242
FRAMING			
GAIN	12%	38%	**24%**
NEUTRAL	54%	42%	**49%**
LOSS	34%	20%	**28%**

Appendix B - SURVEY ON A DECISION

Q0- Individual Information

☐ Female ☐ Male

Age: _____ years

Country of origin: _____

Education background:

☐ Humanities: History, Languages, …
☐ Economics, Business, Political Science, …
☐ Life Sciences: Medicine, Biology, …
☐ Sciences: Engineering, Physics, …
☐ Other: _____

Introduction

The objective of this questionnaire is to study the decisions that people like you make. In particular, we are interested in a decision that you recently made and that involved the choice between two alternatives: a "safe" alternative and a "risky" alternative. In such a decision you get to choose one of the two alternatives. If you choose the safe alternative then a single known outcome ensues. In contrast, if you choose the risky alternative, then several outcomes may occur, and is not under your control to decide which one will finally happen.

In order to simplify the description, please focus on the two main distinct alternatives (safe and risky) that you considered at the time. If the decision that you have in mind cannot be simplified in just two such alternatives or choices, then think of some other decisions.

You may want to quickly scan through the questionnaire to get a feel for the **ten questions** that you will be facing.

Now, think of a decision or problem that you made recently involving two main alternatives, one of them being safe, the other being risky.

Q1- Please describe briefly this decision: _____
_____
_____
The safe alternative was:_____
_____
The risky alternative was: _____
_____

Q2- The outcomes or consequences of this decision had to do with (*check all that apply*):

☐ Monetary gains or expenses.
☐ Comfort or discomfort. ☐ Convenience.
☐ Time: arriving on time or late, delays, waiting.
☐ Social consequences: fame, embarrassment. External appearance.
☐ Career or profession.
☐ Other: _____

Q3- Please describe the "sure outcome" associated with the safe alternative:
Sure outcome: _____

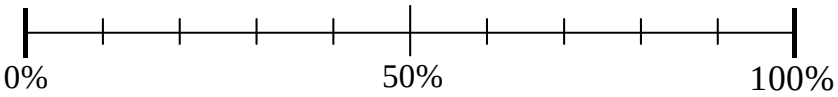
Consider the risky alternative. Summarize the possible outcomes of the risky alternative in two scenarios or outcomes: a good luck scenario or "better outcome" and a bad luck scenario or "worse outcome". Please describe the two-scenario outcomes of the risky alternative:
Better outcome: _____

_____

Worse outcome: _____

Note: If the risky alternative cannot be simplified in two scenarios, then answer questions Q5, Q6, Q10, and finish the questionnaire. Otherwise answer all the questions.

Q4- At the moment of the decision, what was your judgment of the chances that the better outcome of the risky alternative would result? (*Use a cross (X) to indicate in the line below the estimated probability of the better outcome*).



Please write your estimate of this probability, ***p*** = ____%. Of course, if ***p*** is your estimate of the chances of the better outcome, then ***1-p*** is your estimate of the chances of the worse outcome.

Q5- A default or non-proactive alternative is the one actually chosen if nothing is done. *(Check the one box that applies):*

☐ The safe alternative was the default alternative.

☐ The risky alternative was the default alternative.

☐ There was no default alternative because both alternatives required taking some action.

Q6- The **importance** of the decision that you are describing is *(Check one)*

☐ Small ☐ Moderate ☐ High ☐ Very high

Although this decision may be unique, I have made or expect to make _____ (*number*) decisions of **similar importance** during the course of *(check the time scale so that the number is below 10).*

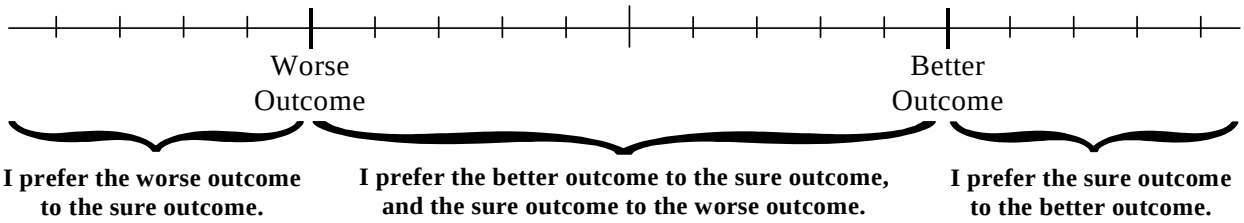
☐ one day ☐ one week ☐ one month ☐ one year ☐ my life

Q7- Valuation of the outcomes. Even though this decision may not have to do with money, we may measure its importance using monetary values. Assume that you took the risky alternative and that the worse outcome actually happened. What is the most you would be willing to pay to reverse your bad luck, namely, to replace the **worse outcome** for the **better outcome**? $ _____.

And to replace the **worse outcome** for the **sure outcome**? $ _____.

Assume that you took the safe alternative and now have the sure outcome. What is the most you would be willing to pay to move from the **sure outcome** to the **better outcome**? $ _____.

Q8- In the line below, the location of the two risky outcomes indicates that the better outcome is preferred to the worse outcome. Please, use a cross (X) to estimate the location of the sure outcome with respect to the worse and better in terms of preference.



Q9- Perception of the Outcomes

9.1- How did you perceive the "sure outcome" in the safe alternative? (*Check one*)

☐ As a gain. ☐ As a loss. ☐ Neutral (neither a gain nor a loss).

9.2- How did you perceive the "better outcome" in the risky alternative? (*Check one*)

☐ As a gain. ☐ As a loss. ☐ Neutral (neither a gain nor a loss).

9.3- How did you perceive the "worse outcome" in the risky alternative? (*Check one*)

☐ As a gain. ☐ As a loss. ☐ Neutral (neither a gain nor a loss).

In the line of Q8 above, please indicate with a circle (O) the location that you would regard as neutral (neither a gain nor a loss). This means that you would perceive the outcomes to the right of "O" as a gain, and the outcomes to the left of "O" as a loss. Of course, if one of the three outcomes above has been marked as neutral, then mark the "O" on top of this one outcome.

Q10- Which alternative did you choose? ☐ The safe alternative / ☐ The risky alternative.

If the uncertainty has been resolved, what happened? _____

_____

_____

Other comments (surprises or unanticipated events regarding the eventual outcomes, important aspects of the decision not reported here, …): _____

_____

_____