Risk and Rationality: The Relative Importance of Probability Weighting and Choice Set Dependence

— Online Appendix —

February 1, 2019

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1 Qualitative Predictions for ST

1.1 Binary Choices to Trigger Common Consequence Allais Paradoxes: Independent Payoffs

CC1.independent

$$X = \begin{cases} 2500, & p_1 \\ z, & p_2 \\ 0, & p_3 \end{cases} \quad vs \quad Y = \begin{cases} 2400, & p_1 + p_2 \\ z, & p_3 \end{cases}$$

where $z \in \{0, 2400\}$.

If $z = 2400$ the choice is:

$$X = \begin{cases} 2500, & p_1 \\ 2400, & p_2 \\ 0, & p_3 \end{cases} \quad vs \quad Y = \{2400$$

The salience rankings are $\sigma(0, 2400) > \sigma(2500, 2400) > \sigma(2400, 2400)$ since $\sigma(0, 2400) > \sigma(0, 100) = \sigma(100, 0) > \sigma(2500, 2400)$. This makes lottery Y more attractive.

If $z = 0$ the choice is:

$$X = \begin{cases} 2500, & p_1 \\ 0, & p_2 + p_3 \end{cases} \quad vs \quad Y = \begin{cases} 2400, & p_1 + p_2 \\ 0, & p_3 \end{cases}$$

The salience rankings are $\sigma(2500, 0) > \sigma(0, 2400) > \sigma(2500, 2400) > \sigma(0, 0)$ since $\sigma(2500, 0) = \sigma(0, 2500) > \sigma(0, 2400)$. This makes lottery X more attractive.

CC2.independent

$$X = \begin{cases} 5000, & p_1 \\ z, & p_2 \\ 0, & p_3 \end{cases} \quad vs \quad Y = \begin{cases} 4800, & p_1 + p_2 \\ z, & p_3 \end{cases}$$

where $z \in \{0, 4800\}$. The stake size is double relative to gambles A1.1 so the salience rankings will be the same.

If $z = 4800$ the choice is:

$$X = \begin{cases} 5000, & p_1 \\ 4800, & p_2 \\ 0, & p_3 \end{cases} \quad vs \quad Y = 4800$$

The salience rankings are $\sigma(0,4800) > \sigma(5000,4800) > \sigma(4800,4800)$ since $\sigma(0,4800) > \sigma(0,200) = \sigma(200,0) > \sigma(5000,4800)$. This makes lottery Y more attractive.

If $z = 0$ the choice is:

$$X = \begin{cases} 5000, & p_1 \\ 0, & p_2 + p_3 \end{cases} \quad vs \quad Y = \begin{cases} 4800, & p_1 + p_2 \\ 0, & p_3 \end{cases}$$

The salience rankings are $\sigma(5000,0) > \sigma(0,4800) > \sigma(5000,4800) > \sigma(0,0)$ since $\sigma(5000,0) = \sigma(0,5000) > \sigma(0,4800)$. This makes lottery X more attractive.

CC3.independent

$$X = \begin{cases} 3000, & p_1 \\ z, & p_2 \\ 500, & p_3 \end{cases} \quad vs \quad Y = \begin{cases} 2600, & p_1 + p_2 \\ z, & p_3 \end{cases}$$

where $z \in \{500, 2600\}$.

If $z = 2600$ the choice is:

$$X = \begin{cases} 3000, & p_1 \\ 2600, & p_2 \\ 500, & p_3 \end{cases} \quad vs \quad Y = 2600$$

The salience rankings are $\sigma(500,2600) > \sigma(3000,2600) > \sigma(2600,2600)$. This makes lottery Y more attractive.

If $z = 500$ the choice is:

$$X = \begin{cases} 3000, & p_1 \\ 500, & p_2 + p_3 \end{cases} \quad vs \quad Y = \begin{cases} 2600, & p_1 + p_2 \\ 500, & p_3 \end{cases}$$

The salience rankings are $\sigma(3000,500) > \sigma(500,2600) > \sigma(3000,2600) > \sigma(500,500)$ since $\sigma(3000,500) = \sigma(500,3000) > \sigma(500,2600)$. This makes lottery X more attractive.

CC4.independent

$$X = \begin{cases} 2500, & p_1 \\ z, & p_2 \\ 0, & p_3 \end{cases} \quad vs \quad Y = \begin{cases} 2400, & p_1 + p_2 \\ z, & p_3 \end{cases}$$

where $z \in \{0, 2000\}$.

If $z = 2000$ the choice is:

$$X = \begin{cases} 2500, & p_1 \\ 2000, & p_2 \\ 0, & p_3 \end{cases} \quad vs \quad Y = \begin{cases} 2400, & p_1 + p_2 \\ 2000, & p_3 \end{cases}$$

The salience rankings are $\sigma(0,2400) > \sigma(0,2000) > \sigma(2500,2000) > \sigma(2000,2400) > \sigma(2000,2000)$ since $\sigma(2500,2000) = \sigma(2000,2500) > \sigma(2000,2400)$. This makes lottery Y more attractive.

If $z = 0$ the choice is:

$$X = \begin{cases} 2500, & p_1 \\ 0, & p_2 + p_3 \end{cases} \quad vs \quad Y = \begin{cases} 2400, & p_1 + p_2 \\ 0, & p_3 \end{cases}$$

The salience rankings are $\sigma(2500,0) > \sigma(0,2400) > \sigma(2500,2400) > \sigma(0,0)$ since $\sigma(2500,0) = \sigma(0,2500) > \sigma(0,2400)$. This makes lottery X more attractive.

CC5.independent

$$X = \begin{cases} 5000, & p_1 \\ z, & p_2 \\ 0, & p_3 \end{cases} \quad vs \quad Y = \begin{cases} 4800, & p_1 + p_2 \\ z, & p_3 \end{cases}$$

where $z \in \{0, 4000\}$. The stake size is double relative to gambles B1.1 so the salience rankings will be the same.

If $z = 4000$ the choice is:

$$X = \begin{cases} 5000, & p_1 \\ 4000, & p_2 \\ 0, & p_3 \end{cases} \quad vs \quad Y = \begin{cases} 4800, & p_1 + p_2 \\ 4000, & p_3 \end{cases}$$

The salience rankings are $\sigma(0,4800) > \sigma(0,4000) > \sigma(5000,4000) > \sigma(4000,4800) > \sigma(4000,4000)$ since $\sigma(0,4000) = \sigma(4000,0) > \sigma(5000,100) > \sigma(5000,4000)$. This makes lottery Y more attractive.

If $z = 0$ the choice is:

$$X = \begin{cases} 5000, & p_1 \\ 0, & p_2 + p_3 \end{cases} \quad vs \quad Y = \begin{cases} 4800, & p_1 + p_2 \\ 0, & p_3 \end{cases}$$

The salience rankings are $\sigma(5000,0) > \sigma(0,4800) > \sigma(5000,4800) > \sigma(0,0)$. This makes lottery X more attractive.

CC6.independent

$$X = \begin{cases} 3000, & p_1 \\ z, & p_2 \\ 500, & p_3 \end{cases} \quad vs \quad Y = \begin{cases} 2600, & p_1 + p_2 \\ z, & p_3 \end{cases}$$

where $z \in \{500, 2000\}$.

If $z = 2000$ the choice is:

$$X = \begin{cases} 3000, & p_1 \\ 2000, & p_2 \\ 500, & p_3 \end{cases} \quad vs \quad Y = \begin{cases} 2600, & p_1 + p_2 \\ 2000, & p_3 \end{cases}$$

The salience rankings are $\sigma(500, 2600) > \sigma(500, 2000) > \sigma(3000, 2000) > \sigma(2000, 2600) > \sigma(2000, 2000)$. This makes lottery Y more attractive.

If $z = 500$ the choice is:

$$X = \begin{cases} 3000, & p_1 \\ 500, & p_2 + p_3 \end{cases} \quad vs \quad Y = \begin{cases} 2600, & p_1 + p_2 \\ 500, & p_3 \end{cases}$$

The salience rankings are $\sigma(3000, 500) > \sigma(2600, 500) > \sigma(3000, 2600) > \sigma(500, 500)$. This makes lottery X more attractive.

1.2 Binary Choices to Trigger Common Consequence Allais Paradoxes: Correlated Payoffs

CC1.correlated

p_s	p_1	p_2	p_3
x_s	2500	z	0
y_s	2400	z	2400

where $z \in \{0, 2400\}$. The salience rankings are $\sigma(0, 2400) > \sigma(2500, 2400) > \sigma(z, z)$ for $z \in \{0, 2400\}$. This makes lottery Y more attractive.

CC2.correlated

p_s	p_1	p_2	p_3
x_s	5000	z	0
y_s	4800	z	4800

where $z \in \{0, 4800\}$. The salience rankings are $\sigma(0, 4800) > \sigma(5000, 4800) > \sigma(z, z)$ for $z \in \{0, 4800\}$. This makes lottery Y more attractive.

CC3.correlated

p_s	p_1	p_2	p_3
x_s	3000	z	500
y_s	2600	z	2600

where $z \in \{500, 2600\}$. The salience rankings are $\sigma(500, 2600) > \sigma(3000, 2600) > \sigma(z, z)$ for $z \in \{500, 2600\}$. This makes lottery Y more attractive.

CC4.correlated

p_s	p_1	p_2	p_3
x_s	2500	z	0
y_s	2400	z	2400

where $z \in \{0, 2000\}$. The salience rankings are $\sigma(0, 2400) > \sigma(2500, 2400) > \sigma(z, z)$ for $z \in \{0, 2000\}$. This makes lottery Y more attractive.

CC5.correlated

p_s	p_1	p_2	p_3
x_s	5000	z	0
y_s	4800	z	4800

where $z \in \{0, 4000\}$. The salience rankings are $\sigma(0, 4800) > \sigma(5000, 4800) > \sigma(z, z)$ for $z \in \{0, 4000\}$. This makes lottery Y more attractive.

CC6.correlated

p_s	p_1	p_2	p_3
x_s	3000	z	500
y_s	2600	z	2600

where $z \in \{500, 2000\}$. The salience rankings are $\sigma(500, 2600) > \sigma(3000, 2600) > \sigma(z, z)$ for $z \in \{500, 2600\}$. This makes lottery Y more attractive.

1.3 Binary Choices to Trigger Common Ratio Allais Paradoxes: Independent Payoffs

CR1.independent

$$X = \begin{cases} 6000 & p = \frac{1}{2}q \\ 0 & 1 - p = 1 - \frac{1}{2}q \end{cases} \quad \text{vs.} \quad Y = \begin{cases} 3000 & q \\ 0 & 1 - q \end{cases}$$

The salience rankings are $\sigma(6000, 0) > \sigma(0, 3000) > \sigma(6000, 3000) > \sigma(0, 0)$. Hence, the decision maker evaluates lottery X as

$$V^{ST}(X|\{X,Y\}) = \left[\pi_1^{ST}(6000,0) + \pi_3^{ST}(6000,3000)\right] v(6000) + \left[\pi_2^{ST}(0,3000) + \pi_4^{ST}(0,0)\right] v(0).$$

and lottery Y as

$$V^{ST}(Y|\{X,Y\}) = \left[\pi_2^{ST}(0,3000) + \pi_3^{ST}(6000,3000)\right] v(3000) + \left[\pi_1^{ST}(6000,0) + \pi_4^{ST}(0,0)\right] v(0).$$

Using $v(0) = 0$ and the decision weights given by equation (1) in the paper, the decision maker prefers Y over X when

$$\begin{aligned} v(3000)\left[\delta(1-p)q + \delta^2 pq\right] &> v(6000)\left[p(1-q) + \delta^2 pq\right] \\ v(3000)\, 2\delta\left[1 - p(1-\delta)\right] &> v(6000)\left[1 - 2p(1-\delta^2)\right] \\ \frac{1-p(1-\delta)}{1-2p(1-\delta^2)} &> \frac{v(6000)}{2\delta v(3000)}. \end{aligned}$$

Note that when p is scaled down, the right hand side of the above inequality remains unchanged, while the left hand side decreases. Hence, for a sufficiently low λ the sign of the above inequality may change, and the decision maker prefers X to Y and exhibits the Common Ratio Allais Paradox.

CR2.independent

$$X = \begin{cases} 5500 & p = \frac{1}{2}q \\ 500 & 1-p = 1-\frac{1}{2}q \end{cases} \quad \text{vs.} \quad Y = \begin{cases} 3000 & q \\ 500 & 1-q \end{cases}$$

The salience rankings are $\sigma(5500,500) > \sigma(500,3000) > \sigma(5500,3000) > \sigma(500,500)$. Hence, the decision maker evaluates lottery X as

$$V^{ST}(X|\{X,Y\}) = \left[\pi_1^{ST}(5500,500) + \pi_3^{ST}(5500,3000)\right] v(5500) + \left[\pi_2^{ST}(500,3000) + \pi_4^{ST}(500,500)\right] v(500).$$

and lottery Y as

$$V^{ST}(Y|\{X,Y\}) = \left[\pi_2^{ST}(500,3000) + \pi_3^{ST}(5500,3000)\right] v(3000) + \left[\pi_1^{ST}(5500,500) + \pi_4^{ST}(500,500)\right] v(500).$$

Using the decision weights given by equation (1) in the paper, the decision maker prefers Y over X when

$$\begin{aligned} v(3000)\,[\delta(1-p)q+\delta^2 pq]+v(500)\,p(1-q) &> v(5500)\,[p(1-q)+\delta^2 pq]+v(500)\,\delta(1-p)q \\ 2p &> \frac{v(5500)-2\delta v(3000)-(1-2\delta)v(500)}{(1-\delta^2)v(5500)-\delta(1-\delta)v(3000)-(1-\delta)v(500)}\,. \end{aligned}$$

Note that when p is scaled down, the right hand side of the above inequality remains unchanged, while the left hand side decreases. Hence, for a sufficiently low λ the sign of the above inequality may change, and the decision maker prefers X to Y and exhibits the Common Ratio Allais Paradox.

CR3.independent

$$X=\begin{cases} 7000 & p=\frac{1}{2}q \\ 1000 & 1-p=1-\frac{1}{2}q \end{cases} \quad \text{vs.} \quad Y=\begin{cases} 4000 & q \\ 1000 & 1-q \end{cases}$$

The salience rankings are $\sigma(7000,1000)>\sigma(1000,4000)>\sigma(7000,4000)>\sigma(1000,1000)$. Hence, the decision maker evaluates lottery X as

$$\begin{aligned} V^{ST}(X|\{X,Y\}) &= \left[\pi_1^{ST}(7000,1000)+\pi_3^{ST}(7000,4000)\right]\,v(7000) \\ &\quad +\left[\pi_2^{ST}(1000,4000)+\pi_4^{ST}(1000,1000)\right]\,v(1000)\,. \end{aligned}$$

and lottery Y as

$$\begin{aligned} V^{ST}(Y|\{X,Y\}) &= \left[\pi_2^{ST}(1000,4000)+\pi_3^{ST}(7000,4000)\right]\,v(4000) \\ &\quad +\left[\pi_1^{ST}(7000,1000)+\pi_4^{ST}(1000,1000)\right]\,v(1000)\,. \end{aligned}$$

Using the decision weights given by equation (1) in the paper, the decision maker prefers Y over X when

$$\begin{aligned} v(4000)\,[\delta(1-p)q+\delta^2 pq]+v(1000)\,p(1-q) &> v(7000)\,[p(1-q)+\delta^2 pq]+v(1000)\,\delta(1-p)q \\ 2p &> \frac{v(7000)-2\delta v(4000)-(1-2\delta)v(1000)}{(1-\delta^2)v(7000)-\delta(1-\delta)v(4000)-(1-\delta)v(1000)}\,. \end{aligned}$$

Note that when p is scaled down, the right hand side of the above inequality remains unchanged, while the left hand side decreases. Hence, for a sufficiently low λ the sign of the above inequality may change, and the decision maker prefers X to Y and exhibits the Common Ratio Allais Paradox.

1.4 Binary Choices to Trigger Common Ratio Allais Paradoxes: Correlated Payoffs

CR1.correlated

p_s	p	p	$1-2p$
x_s	6000	0	0
y_s	3000	3000	0

The salience rankings are $\sigma(0,3000) > \sigma(6000,3000) > \sigma(0,0)$. Hence, the decision maker evaluates lottery X as

$$V^{ST}(X|X,Y) = \pi_2^{ST}(6000,3000)\, v(6000) + \left[\pi_1^{ST}(0,3000) + \pi_3^{ST}(0,0)\right]\, v(0)$$

and evaluates lottery Y as

$$V^{ST}(Y|X,Y) = \left[\pi_1^{ST}(0,3000) + \pi_2^{ST}(6000,3000)\right]\, v(3000) + \pi_3^{ST}(0,0)\, v(0)$$

Using $v(0) = 0$ and the decision weights given by equation (1) in the paper, the decision maker prefers X over Y when

$$\begin{aligned} v(6000)\,\delta p &> v(3000)\,(\delta p + p) \\ v(6000)\,\delta p &> v(3000)\,(\delta p + p) \\ \frac{v(6000)}{v(3000)} &> \frac{1+\delta}{\delta}. \end{aligned}$$

Hence, regardless of the value of p, the decision maker always prefers X over Y when the above inequality holds, and otherwise always prefers Y over X. Consequently, the decision maker never exhibits the Common Ratio Allais Paradox when the lotteries' payoffs are correlated.

CR2.correlated

p_s	p	p	$1-2p$
x_s	5500	500	500
y_s	3000	3000	500

The salience rankings are $\sigma(500, 3000) > \sigma(5500, 3000) > \sigma(500, 500)$. Hence, the decision maker evaluates lottery X as

$$V^{ST}(X|X,Y) = \pi_2^{ST}(5500, 3000)\, v(5500) + \left[\pi_1^{ST}(500, 3000) + \pi_3^{ST}(500, 500)\right]\, v(500)$$

and evaluates lottery Y as

$$V^{ST}(Y|X,Y) = \left[\pi_1^{ST}(500, 3000) + \pi_2^{ST}(5500, 3000)\right]\, v(3000) + \pi_3^{ST}(500, 500)\, v(500)$$

Using the decision weights given by equation (1) in the paper, the decision maker prefers X over Y when

$$\begin{aligned} v(5500)\,\delta p + v(500)\, p &> v(3000)\,(p + \delta p) \\ v(5500)\,\delta + v(500) &> v(3000)\,(1 + \delta) \\ \delta &> \frac{v(3000) - v(500)}{v(5500) - v(3000)}\,. \end{aligned}$$

Hence, regardless of the value of p, the decision maker always prefers X over Y when the above inequality holds, and otherwise always prefers Y over X. Consequently, the decision maker never exhibits the Common Ratio Allais Paradox when the lotteries' payoffs are correlated.

CR3.correlated

p_s	p	p	$1 - 2p$
x_s	7000	1000	1000
y_s	4000	4000	1000

The salience rankings are $\sigma(1000, 4000) > \sigma(7000, 4000) > \sigma(1000, 1000)$. Hence, the decision maker evaluates lottery X as

$$V^{ST}(X|X,Y) = \pi_2^{ST}(7000, 4000)\, v(7000) + \left[\pi_1^{ST}(1000, 4000) + \pi_3^{ST}(1000, 1000)\right]\, v(1000)$$

and evaluates lottery Y as

$$V^{ST}(Y|X,Y) = \left[\pi_1^{ST}(1000, 4000) + \pi_2^{ST}(7000, 4000)\right]\, v(4000) + \pi_3^{ST}(1000, 1000)\, v(1000)$$

Using the decision weights given by equation (1) in the paper, the decision maker prefers X over Y when

$$\begin{aligned} v(7000)\,\delta p + v(1000)\, p &> v(4000)\,(p + \delta p) \\ v(7000)\,\delta + v(1000) &> v(4000)\,(1 + \delta) \\ \delta &> \frac{v(4000) - v(1000)}{v(7000) - v(4000)}\,. \end{aligned}$$

Hence, regardless of the value of p, the decision maker always prefers X over Y when the above inequality holds, and otherwise always prefers Y over X. Consequently, the decision maker never exhibits the Common Ratio Allais Paradox when the lotteries' payoffs are correlated.

2 Instructions

The following pages contain translations of the instructions that were handed out to the subjects. The original instructions in French are available on request.

The subjects received printed instructions regarding the general explanations on the experiment, the main part of the experiment (Part 1), and the additional part of the experiment (Part 2). Note that the instructions of the main part of the experiemnt differ, depending on wehther the subject was exposed to the canonical representation or the states of the world representation.

The instructions of the remaining Parts 3-5 were shown on screen and are available on request.

General explanations on the experiment

You are about to participate in an economic experiment. The experiment is conducted by the departement d'économetrie et économie politique (DEEP) of the university of Luasanne and funded by the Swiss National Science Foundation (SNSF). It aims at better understanding individual decision making under risk.

For your participation in the experiment you will earn a lump sum payment of 10 CHF for sure. The experiment consists of five parts in some of which you can earn points that depend on your decisions. At the end of the experiment, you get an additional payment of one CHF for every 100 points you earned during the course of the experiment. In other words, each point corresponds to one centime. **Thus, it is to your own benefit to read these explanations carefully.**

You can take your decisions at your own speed. The amount of points you earn only depends on your own decisions.

It is prohibited to communicate with the other participants during the whole course of the experiment. If you do not abide by this rule you will be excluded from the experiment and all payments. However, if you have questions you can always ask one of the experimenters by raising your hand.

You can also abort the experiment anytime you wish without giving any reasons. To do so, please raise your hand and tell the experimenter that you wish to abort the experiment. The experimenter will then guide you outside the laboratory. Note that if you abort the experiment, you are not entitled to any payments.

We will ask you about your personal information and contact address in the fifth part of the experiment. We will only use this information in an anonymized way for scientific purposes or to contact you again with respect this experiment, if necessary. **Thus, your anonymity is guaranteed.**

The backside of these explanations gives you an overview of the experiment. If you have any questions please raise your hand. Otherwise, you can now begin with the instructions of first part of the experiment.

Thank you very much for your participation!

Overview of the experiment

Part 1:
Choosing between two risky options

↓

Part 2:
Choosing between a risky option and a sure amount

↓

Part 3:
Pattern supplementation

↓

Part 4:
Personality questionnaire

↓

Part 5:
Personal Data

↓

Payment

Part 1: Choosing between two risky options [Canonical Presentation]

In this part of the experiment, you first draw a sealed envelope that contains one of 93 decision situations in which you have to choose between two risky options. The possible payoffs of the two risky options are either correlated with each other or independent of each other.

The decision situation in the sealed envelope is the only one relevant for your payoff in this part of the experiment. **However, you are not allowed to open the envelope before the end of the experiment (if you do, you will be excluded from the experiment and all payments).** Instead, you should give us instructions on the computer screen, for each of the 93 decision situations that may be in you sealed envelope, which of the two risky options you choose.

These explanations first contain two examples of the decision situations for which you have to give us instructions on the computer screen. In the first example the possible payoffs of the two risky options are correlated, while in the second example they are independent. Subsequently, the explanations illustrate how your payoff for this part of the experiment is calculated. Finally, they contain some questions that verify your understanding.

Examples of decision situations

In each of the 93 decision situations that may be in your sealed envelope you have the choice between two risky options X and Y. In 45 out of these 93 decision situations the possible payoffs of the two risky options are correlated with each other, while in the remaining 48 decision situations the possible payoffs are independent of each other.

Correlated payoffs

First, consider the following example of a decision situation in which the possible payoffs of the two risky options are correlated. There are three possible payoff states which are realized with probabilities 10.50%, 19.50%, and 70.00%, respectively. Option X pays either 0, 500, or 2400 points depending on the realized payoff state. Option Y yields either 500, 500, or 1500 points depending on the realized payoff state. Hence, the realized payoff state determines the payoff of *both* risky options. For example, if the rightmost payoff state is realized, option X yields 2400 and option Y pays 1500 points.

Probability:	10.50%	19.50%	70.00%	Your Choice
Option X	0	500	2400	❑
Option Y	500	500	1500	❑

If you indicate on the computer screen that you prefer option X and if the decision situation in this example corresponds to the one in your envelope, you get either 0 points with probability 10.50%, 500 points with probability 19.50%, or 2400 points with probability 70.00%. If you indicate that you prefer option Y instead and if the decision situation in this example corresponds to the one in your envelope, you get either 500 points with probability 10.50%, 500 points with probability

19.50%, or 1500 points with probability 70.00%.

Independent payoffs

Now, consider the following example of a decision situation in which the possible payoffs of the two risky options are independent. Option X pays either 0, 500, or 2400 points with probability 10.50%, 19.50%, or 70.00%, respectively. Option Y yields either 500 or 1500 points with probability 30.00% or 70.00%, respectively. Since the possible payoffs are independent, the payoff of one option does not determine the payoff of the other. For example, if the realized payoff of option X is 2400 points, option Y still pays either 500 points with probability 30.00% or 1500 points with probability 70.00%.

Probability:	10.50%	19.50%	70.00%		Probability:	30.00%	70.00%
Option X	0	500	2400	VS.	Option Y	500	1500
Your Choice:		❑				❑	

If you indicate on the computer screen that you prefer option X and if the decision situation in this example corresponds to the one in your envelope, you get either 0 points with probability 10.50%, 500 points with probability 19.50%, or 2400 points with probability 70.00%. If you indicate that you prefer option Y instead and if the decision situation in this example corresponds to the one in your envelope, you get either 500 points with probability 30.00%, or 1500 points with probability 70.00%.

Possible payoffs and probabilities

In each decision situation, you always have to indicate your choice between the two risky options X and Y. However, the number and the size of the possible payoffs as well as the corresponding probabilities differ across the 93 decision situations.

- The number of possible payoffs of a risky option is always between 1 and 3.
- The size of the payoffs varies between 0 and 7000 points.
- The corresponding probabilities of the payoffs range from 1% to 100%.

Calculation of your payoff

At the end of the experiment, you will hand in the sealed envelope to the experimenter who will open it together with you. For the decision situation that is inside your envelope, you will then get the option you have previously indicated on the computer screen.

Correlated payoffs

For instance, let's assume that the decision situation in your envelope is the one with the correlated payoffs from before, and you instructed us on the computer screen that you prefer option X:

Probability:	10.50%	19.50%	70.00%	Your Choice
Option X	0	500	2400	✓
Option Y	500	500	1500	❑

After opening the envelope, you will have to roll four 10-sided dice to generate a random number between 0000 and 9999. The first die indicates the first digit corresponding to thousands. The second die indicates the second digit corresponding to hundreds. The third die indicates the third digit corresponding to tens. Finally, the fourth die indicates the last digit corresponding to units. This random number determines the realized payoff state, as shown in the table below.

Random number				
between	*0000*	*1050*	*3000*	
and	*1049*	*2999*	*9999*	
Probability:	10.50%	19.50%	70.00%	Your Choice
Option X	0	500	2400	✓
Option Y	500	500	1500	❑

With probability 10.50% the random number lies between 0000 and 1049, and the first payoff state is realized. With probability 19.50%, the random number is between 1050 and 2999, and the second payoff state is realized. Finally, with probability 70.00% the random number is between 3000 and 9999, and the third payoff state is realized.

For example, assume that the random number you roll is 4276. Since 4276 is between 3000 and 9999, the third payoff state is realized, and your resulting payoff is 2400 points.

Thus, if you indicate the option you want on the computer screen, you will get the option you want. However, if you give us wrong instructions on the computer screen, you won't get the option you want.

Independent payoffs

Now, assume that the decision situation in your envelope is the one with the independent payoffs from before, and you instructed us on the computer screen that you prefer option Y:

Probability:	10.50%	19.50%	70.00%		Probability:	30.00%	70.00%
Option X	0	500	2400	VS.	Option Y	500	1500
Your Choice:		❑				✓	

After opening the envelope, you will have to roll the four 10-sided dice twice to generate two random numbers between 0000 and 9999. Since the risky options are independent, the first random number determines the payoff of option X, while the second random number determines the payoff of option Y.

First random number					*Second random number*		
between	*0000*	*1050*	*3000*		*between*	*0000*	*3000*
and	*1049*	*2999*	*9999*		*and*	*2999*	*9999*
Probability:	10.50%	19.50%	70.00%		Probability:	30.00%	70.00%
Option X	0	500	2400	VS.	Option Y	500	1500
Your Choice:		❑				✓	

With probability 30.00% the second random number lies between 0000 and 2999, and option Y pays 500 points. With probability 70.00% the second random number is between 3000 and 9999, and option Y yields 1500 points.

For instance, assume that the second random number you roll is 1387. As 1387 is between 0000 and 2999, your resulting payoff from choosing option Y is 500 points.

Again, if you indicate the option you want on the computer screen, you will get the option you want. However, if you give us wrong instructions on the computer screen, you won't get the option you want.

Questions to verify your understanding

The following questions test whether you correctly understood the explanations for the first part of the experiment.

Let's assume that at the end of the experiment your envelope contains the following decision situation:

Random number					
between	*0000*	*0525*	*1800*	*3800*	
and	*0524*	*1799*	*3799*	*9999*	
Probability:	5.25%	12.75%	20.00%	62.00%	Your Choice
Option X	0	1000	1500	3500	❑
Option Y	100	1000	2000	2500	❑

If you indicated on the computer screen that you prefer option Y, what are the possible payoffs and corresponding probabilities?

If you roll the number 2845, which of these payoffs will you get?

To how many CHF does this payoff correspond?

Now, assume that at the end of the experiment your envelope contains the following decision situation:

First random number					*Second random number*		
between	*0000*	*1550*	*3450*		*between*	*0000*	*3450*
and	*1549*	*3449*	*9999*		*and*	*3449*	*9999*
Probability:	15.50%	19.00%	65.50%		Probability:	34.50%	65.50%
Option X	100	1500	2400	VS.	Option Y	1500	2000
Your Choice:		❑				❑	

What is your payoff if you indicated on the computer screen that you prefer option X, and the first random number you rolled is 1201, while the second random number is 5498?

After finishing these questions, please raise your hand and wait for the experimenter to correct them. Thank you.

Part 1: Choosing between two risky options [States of the World Presentation]

In this part of the experiment, you first draw a sealed envelope that contains one of 84 decision situations in which you have to choose between two risky options.

The decision situation in the sealed envelope is the only one relevant for your payoff in this part of the experiment. **However, you are not allowed to open the envelope before the end of the experiment (if you do, you will be excluded from the experiment and all payments).** Instead, you should give us instructions on the computer screen, for each of the 84 decision situations that may be in you sealed envelope, which of the two risky options you choose.

These explanations first contain an example of one of the decision situations for which you have to give us instructions on the computer screen. Subsequently, they illustrate how your payoff for this part of the experiment is calculated. Finally, they contain some questions to verify that you understood the explanations correctly.

Example of a decision situation

In each of the 84 decision situations that may be in your sealed envelope you have the choice between two risky options X and Y.

Consider the following example. There are three possible payoff states which are realized with probabilities 10.50%, 19.50%, and 70.00%, respectively. Option X pays either 0, 500, or 2400 points depending on the realized payoff state. Option Y yields either 500, 500, or 1500 points depending on the realized payoff state.

Probability:	10.50%	19.50%	70.00%	Your Choice
Option X	0	500	2400	❑
Option Y	500	500	1500	❑

Thus, if you indicate on the computer screen that you prefer option X and if the decision situation in this example corresponds to the one in your envelope, you get either 0 points with probability 10.50%, 500 points with probability 19.50%, or 2400 points with probability 70.00%. If you indicate that you prefer option Y instead and if the decision situation in this example corresponds to the one in your envelope, you get either 500 points with probability 10.50%, 500 points with probability 19.50%, or 1500 points with probability 70.00%.

In each of the 84 decision situation, you always have to indicate your choice between two risky options X and Y. However, the number of payoff states as well as the corresponding probabilities and sizes of the payoffs differ across the 84 decision situations.

- The number of payoff states is always either 3 or 4.
- The probabilities of the payoff states range from 0.02% to 97.02%.
- The sizes of the payoffs vary between 0 and 7000 points.

Calculation of your payoff

At the end of the experiment, you will hand in the sealed envelope to the experimenter who will open it together with you. For the decision situation that is inside your envelope, you will then get the option you have previously indicated on the computer screen.

For instance, let's assume that the decision situation in your envelope is the one from before, and you instructed us previously on the computer screen that you prefer option X:

Probability:	10.50%	19.50%	70.00%	Your Choice
Option X	0	500	2400	✓
Option Y	500	500	1500	❑

After opening the envelope, you will have to roll four 10-sided dice to generate a random number between 0000 and 9999. The first die indicates the first digit corresponding to thousands. The second die indicates the second digit corresponding to hundreds. The third die indicates the third digit corresponding to tens. Finally, the fourth die indicates the last digit corresponding to units. This random number determines the realized payoff state, as shown in the table below.

Random number				
between	*0000*	*1050*	*3000*	
and	*1049*	*2999*	*9999*	
Probability:	10.50%	19.50%	70.00%	Your Choice
Option X	0	500	2400	✓
Option Y	500	500	1500	❑

With probability 10.50% the random number lies between 0000 and 1049, and the first payoff state is realized. With probability 19.50%, the random number is between 1050 and 2999, and the second payoff state is realized. Finally, with probability 70.00% the random number is between 3000 and 9999, and the third payoff state is realized.

For example, assume that the random number you roll is 4276. Since 4276 is between 3000 and 9999, the third payoff state is realized, and your resulting payoff is 2400 points.

Thus, if you indicate the option you want on the computer screen, you will get the option you want. However, if you give us wrong instructions on the computer screen, you won't get the option you want.

Questions to verify your understanding

The following three questions test whether you correctly understood the explanations for the first part of the experiment.

Let's assume that at the end of the experiment your envelope contains the following decision situation:

Random number					
between	*0000*	*0525*	*1800*	*3800*	
and	*0524*	*1799*	*3799*	*9999*	
Probability:	5.25%	12.75%	20.00%	62.00%	Your Choice
Option X	0	1000	1500	3500	❑
Option Y	100	1000	2000	2500	❑

If you indicated on the computer screen that you prefer option Y, what are the possible payoffs and corresponding probabilities?

____

If you roll the number 2845, which of these payoffs will you get?

____

To how many CHF does this payoff correspond?

____

After finishing these questions, please raise your hand and wait for the experimenter to correct them. Thank you.

Part 2: Choosing between a risky option and a sure amount

In this part of the experiment, you first draw a sealed envelope that contains one of 180 decision situations in which you have to choose between a risky option and a sure amount.

The decision situation in the sealed envelope is the only one relevant for your payoff in this part of the experiment. **However, you are not allowed to open the envelope before the end of the experiment (if you do, you will be excluded from the experiment and all payments).** Instead, you should give us instructions on the computer screen, for each of the 180 decision situations that may be in you sealed envelope, whether you choose the risky option or the sure amount.

These explanations first contain an example of a computer screen on which you have to give us instructions about your choice. Subsequently, they illustrate how your payoff for this part of the experiment is calculated. Finally, they contain a question to verify that you understood the explanations correctly.

Example of a computer screen

There will be nine computer screens each containing 20 decision situations. In each of these decision situations, you have to chose between either a risky option A or a sure amount B.

Consider the example below of such a computer screen. The risky option remains the same across all 20 decision situations. However, the sure amount increases from the lowest possible payoff of the risky option, 0, to its highest possible payoff, 6400, in twenty equally sized steps.

	Option A	Your Choice	Option B
1		A ❑ ❑ B	0
2		A ❑ ❑ B	320
3		A ❑ ❑ B	640
4		A ❑ ❑ B	960
5		A ❑ ❑ B	1280
6		A ❑ ❑ B	1600
7		A ❑ ❑ B	1920
8	6400 with	A ❑ ❑ B	2240
9	probability 10 %	A ❑ ❑ B	2560
10		A ❑ ❑ B	2880
11	or	A ❑ ❑ B	3200
12	0 with	A ❑ ❑ B	3520
13	probability 90%	A ❑ ❑ B	3840
14		A ❑ ❑ B	4160
15		A ❑ ❑ B	4480
16		A ❑ ❑ B	5120
17		A ❑ ❑ B	5440
18		A ❑ ❑ B	5760
19		A ❑ ❑ B	6080
20		A ❑ ❑ B	6400

For each of these 20 decision situations on the computer screen, you have to give us instructions whether you choose the risky option A or the sure amount B, if that decision is in your sealed envelope. For instance, you may start by choosing the risky option in the first decision situation where the sure amount is zero. But at some decision situations further down the list, where the sure amount is larger, you may switch to choosing the sure amount instead of the risky option.

Across the nine computer screens, the risky option differs: It always has two possible payoffs, but the probabilities and sizes of these two possible payoffs vary.

- The probabilities range from 4.00% to 96.00%.
- The lower of the two possible payoffs is always 0, while higher one varies between 400 and 6000 points.

Calculation of your payoff

At the end of the experiment, you will hand in the sealed envelope to the experimenter who will open it together with you. For the decision situation that is inside your envelope, you will then get the option you have previously chosen on the computer screen.

For example, consider you gave us the following instructions on the computer screen from before:

	Option A	Your Choice	Option B
1	6400 with probability 10 % or 0 with probability 90%	A ✓ ❑ B	0
2		A ✓ ❑ B	320
3		A ✓ ❑ B	640
4		A ✓ ❑ B	960
5		A ✓ ❑ B	1280
6		A ✓ ❑ B	1600
7		A ✓ ❑ B	1920
8		A ❑ ✓ B	2240
9		A ❑ ✓ B	2560
10		A ❑ ✓ B	2880
11		A ❑ ✓ B	3200
12		A ❑ ✓ B	3520
13		A ❑ ✓ B	3840
14		A ❑ ✓ B	4160
15		A ❑ ✓ B	4480
16		A ❑ ✓ B	5120
17		A ❑ ✓ B	5440
18		A ❑ ✓ B	5760
19		A ❑ ✓ B	6080
20		A ❑ ✓ B	6400

Moreover, assume that your envelope contains the following decision situation which corresponds to the *sixth row* in the above computer screen:

- Option A: 6400 with probability 10% (random number between 0000 and 0999), or 0 with probability 90% (random number between 1000 and 9999).
- Option B: 1600 for sure.

Since in this example, you chose the risky option A over the sure amount of 1600 in the sixth row of the computer screen, you will get the risky option A. As in the first part of the experiment, you will have to roll four 10-sided dice to generate a random number between 0000 and 9999 that will determine the realized payoff of the risky option A. If you had chosen the sure amount instead of the risky option, you would have gotten 1600 points for sure.

Thus, if you indicate the option you want on the computer screen, you will get the option you want. However, if you give us wrong instructions on the computer screen, you won't get the option you want.

Question to verify your understanding

The following question tests whether you correctly understood the explanations for the second part of the experiment.

Let's assume that the decision situation in your envelope corresponds to the *sixteenth row* of the example of the computer screen as shown on the previous page, i.e.:

- Option A: 6400 with probability 10% (random number between 0000 and 0999), or 0 with probability 90% (random number between 1000 and 9999).
- Option B: 5120 for sure.

If you gave the same instructions as in the example of the computer screen on the previous page, does your payoff depend on the random number you roll? If yes, what are the possible payoffs? If not, which payoff do you get?

After finishing these questions, please raise your hand and wait for the experimenter to correct them. Thank you.