A Appendix: Proofs and Technicalities

In this appendix, we provide a proof of Proposition 1 which gives the theoretical predictions we make about treatment differences. The proof will be organised in a sequence of lemmata.

Lemma 1. *In the BDM, the unique admissible bid b_i^d for subject i of type d, where $d \in \{self, alt, spite\}$, is implicitly defined by*

$$\frac{1}{2} f_i^d \left(e + w - b_i^d\right) + \frac{1}{2} f_i^d \left(e - b_i^d\right) = f_i^d(e). \tag{A.1}$$

Proof. Trivial, hence omitted. ■

Recall that (x_i, x_j), $j \neq i$, denotes an allocation of money. For selfish subjects the payoff is of the form $U_i^{\text{self}}(x_i, x_j) = f_i^{\text{self}}(x_i)$. Given the experimental design, the functional specification takes the form

$$\begin{aligned} U_i^{\text{self}}(b_i, b_j) = &\left[\frac{1}{2} f_i^{\text{self}}\left(e + w - b_j\right) + \frac{1}{2} f_i^{\text{self}}\left(e - b_j\right)\right] \cdot \mathrm{I}_{b_i > b_j} \\ &+ \left[f_i^{\text{self}}(e)\right] \cdot \mathrm{I}_{b_i < b_j} \\ &+ \left[\frac{1}{2}\left(\frac{1}{2} f_i^{\text{self}}\left(e + w - b_j\right) + \frac{1}{2} f_i^{\text{self}}\left(e - b_j\right)\right) + \frac{1}{2} f_i^{\text{self}}(e)\right] \cdot \mathrm{I}_{b_i = b_j}, \end{aligned} \tag{A.2}$$

where b_j is the bid of player $j \neq i$, and $\mathrm{I}_{(\cdot)}$ is the indicator function taking values 0 and 1, respectively, depending on i winning, losing or entering the tie-break in the auction.

Lemma 2. *Consider the treatment* VA. *Here, b_i^{self} as defined in Eq.* (A.1) *is the unique admissible bid.*

Proof. Trivial, hence omitted. ■

For the next two lemmata, we need an additional assumption. For two strictly increasing functions f and g, say that f *is more concave than* g, written $f \succ_{\text{conc}} g$, if and only if $g^{-1}(f)$ is a concave function. As outlined in Section 2 in the paper, we shall maintain the following assumption:

Assumption 1. Let f_i^d and g_i^d be strictly increasing functions where f_i^d evaluates lotteries with consequences affecting monetary payoffs for i, and g_i^d evaluates lotteries with consequences affecting monetary payoffs for $j \neq i$. Then $f_i^d \succ_{\text{conc}} g_i^d$.

Assumption 1 guarantees that the certainty equivalent for a lottery evaluated with function $f_i^d(\cdot)$ is weakly lower than the certainty equivalent under $g_i^d(\cdot)$ and rules out "altruistic overbidding".

Lemma 3. *Consider the* VA *treatment and suppose that Assumption 1 holds. For altruistic subjects b_i^{alt} as defined in Eq.* (A.1) *weakly dominates any strategy $b_i' > b_i^{alt}$.*

Proof. Recall that an altruistic subject's payoff function is of the form $U_i^{\text{altr}}(x_i, x_j) = f_i^{\text{alt}}(x_i) + g_i^{\text{alt}}(x_j)$, where $g_i^{\text{alt}}(\cdot)$ is a strictly increasing function. Given the experimental design, the functional specification takes the form

$$\begin{aligned} U_i^{\text{altr}}(b_i, b_j) = & \left[\frac{1}{2} f_i^{\text{alt}}(e + w - b_j) + \frac{1}{2} f_i^{\text{alt}}(e - b_j) + g_i^{\text{alt}}(e)\right] \cdot \mathrm{I}_{b_i > b_j} \\ & + \left[f_i^{\text{alt}}(e) + \left(\frac{1}{2} g_i^{\text{alt}}(e + w - b_i) + \frac{1}{2} g_i^{\text{alt}}(e - b_i)\right)\right] \cdot \mathrm{I}_{b_i < b_j} \\ & + \left[\frac{1}{2}\left(\frac{1}{2} f_i^{\text{alt}}(e + w - b_j) + \frac{1}{2} f_i^{\text{alt}}(e - b_j) + \ g_i^{\text{alt}}(e)\right)\right. \\ & \left. + \frac{1}{2}\left(f_i^{\text{alt}}(e) + \left(\frac{1}{2} g_i^{\text{alt}}(e + w - b_i) + \frac{1}{2} g_i^{\text{alt}}(e - b_i)\right)\right)\right] \cdot \mathrm{I}_{b_i = b_j}. \end{aligned} \tag{A.3}$$

First note that for a bid $b_i' > b_i^{\text{alt}}$ that results in losing the auction ($b_j \geq b_i'$) an altruistic type could always strictly increase her utility by lowering her bid to b_i^{alt}, thereby making j pay a lower price. Hence, it is sufficient to show that altruist i never (weakly) prefers winning the auction at a bid $b_i' > b_i^{\text{alt}}$ (and paying $b_j > b_i^{\text{alt}}$) to losing at b_i^{alt}. For the sake of exposition, we omit the case of entering the tie-break at some $b_i' > b_i^{\text{alt}}$, for which an analogous argument can be established along the very same lines.

Now to the contrary suppose that the following holds:

$$\begin{aligned} & \frac{1}{2} f_i^{\text{alt}}(e + w - b_j) + \frac{1}{2} f_i^{\text{alt}}(e - b_j) + g_i^{\text{alt}}(e) \\ \geq & \frac{1}{2} g_i^{\text{alt}}\left(e + w - b_i^{\text{alt}}\right) + \frac{1}{2} g_i^{\text{alt}}\left(e - b_i^{\text{alt}}\right) + f_i^{\text{alt}}(e). \end{aligned} \tag{A.4}$$

Straightforward algebraic manipulation of inequality (A.4) yields

$$\begin{aligned} & g_i^{\text{alt}}(e) - \frac{1}{2} g_i^{\text{alt}}\left(e + w - b_i^{\text{alt}}\right) - \frac{1}{2} g_i^{\text{alt}}\left(e - b_i^{\text{alt}}\right) \\ \geq & f_i^{\text{alt}}(e) - \frac{1}{2} f_i^{\text{alt}}(e + w - b_j) - \frac{1}{2} f_i^{\text{alt}}(e - b_j). \end{aligned} \tag{A.5}$$

If $f_i^{\text{alt}}(\cdot) = g_i^{\text{alt}}(\cdot)$, the r.h.s. in (A.5) is strictly positive, whereas the l.h.s. is zero – a contradiction. Consider now the case $f_i^{\text{alt}}(\cdot) \neq g_i^{\text{alt}}(\cdot)$. Note that the expression on the l.h.s. of inequality (A.5) is strictly negative: By Assumption 1, we have $\hat{b}_i > b_i^{\text{alt}}$ for the $\hat{b}_i$ solving the expression $\frac{1}{2}g_i^{\text{alt}}\left(e + w - \hat{b}_i\right) + \frac{1}{2}g_i^{\text{alt}}\left(e - \hat{b}_i\right) = g_i^{\text{alt}}(e)$. Rearranging inequality (A.5) gives

$$1 \leq \frac{f_i^{\text{alt}}(e) - \frac{1}{2}f_i^{\text{alt}}(e + w - b_j) - \frac{1}{2}f_i^{\text{alt}}(e - b_j)}{g_i^{\text{alt}}(e) - \frac{1}{2}g_i^{\text{alt}}\left(e + w - b_i^{\text{alt}}\right) - \frac{1}{2}g_i^{\text{alt}}\left(e - b_i^{\text{alt}}\right)}. \tag{A.6}$$

If $f_i^{\text{alt}}(\cdot) \neq g_i^{\text{alt}}(\cdot)$, the numerator of this expression is strictly positive by the definition of b_i^{alt} in Eq. (A.1) and $b_j > b_i^{\text{alt}}$, while the denominator is strictly negative. Thus, the r.h.s. of inequality (A.6) is strictly negative, which establishes the desired contradiction.

■

Lemma 4. *Consider the* VA *treatment and suppose that Assumption 1 holds. For spiteful subjects b_i^{spite} as defined in Eq.* (A.1) *weakly dominates any strategy $b_i' < b_i^{spite}$.*

Proof. Recall that a spiteful subject's payoff function is of the form $U_i^{\text{spite}}(x_i, x_j) = f_i^{\text{spite}}(x_i) - g_i^{\text{spite}}(x_j)$, where $g_i^{\text{spite}}(\cdot)$ is a strictly increasing function. Given the experimental design, the functional specification takes the form

$$\begin{aligned} U_i^{\text{spite}}(b_i, b_j) = {} & \left[\frac{1}{2}f_i^{\text{spite}}(e + w - b_j) + \frac{1}{2}f_i^{\text{spite}}(e - b_j) - g_i^{\text{spite}}(e)\right] \cdot \mathrm{I}_{b_i > b_j} \\ & + \left[f_i^{\text{spite}}(e) - \left(\frac{1}{2}g_i^{\text{spite}}(e + w - b_i) + \frac{1}{2}g_i^{\text{spite}}(e - b_i)\right)\right] \cdot \mathrm{I}_{b_i < b_j} \\ & + \left[\frac{1}{2}\left(\frac{1}{2}f_i^{\text{spite}}(e + w - b_j) + \frac{1}{2}f_i^{\text{spite}}(e - b_j) - g_i^{\text{spite}}(e)\right)\right. \\ & \left. + \frac{1}{2}\left(f_i^{\text{spite}}(e) - \left(\frac{1}{2}g_i^{\text{spite}}(e + w - b_i) + \frac{1}{2}g_i^{\text{spite}}(e - b_i)\right)\right)\right] \cdot \mathrm{I}_{b_i = b_j}. \end{aligned} \tag{A.7}$$

The argument we use in the proof is analogous to the the argument in the proof of Lemma 3. Now we need to show that spiteful i never (weakly) prefers to lose the auction at a bid $b_i' < b_i^{\text{spite}}$ to winning at b_i^{spite}. It is sufficient to consider that case because when a spiteful i wins at $b_i' < b_i^{\text{spite}}$, she can increase her bid to b_i^{spite} without any change in utility. Again, we omit the case of entering the tie-break at some $b_i' < b_i^{\text{spite}}$ for which the result can be shown along the same lines. For the sake of contradiction, suppose the following holds:

$$
\begin{aligned}
& f_i^{\text{spite}}(e) - \left(\frac{1}{2} g_i^{\text{spite}}(e + w - b_i') + \frac{1}{2} g_i^{\text{spite}}(e - b_i')\right) \\
\geq & \frac{1}{2} f_i^{\text{spite}}(e + w - b_i') + \frac{1}{2} f_i^{\text{spite}}(e - b_i') - g_i^{\text{spite}}(e) .
\end{aligned} \tag{A.8}
$$

Straightforward algebraic manipulation of inequality (A.8) yields

$$
\begin{aligned}
& g_i^{\text{spite}}(e) - \frac{1}{2}\left(g_i^{\text{spite}}(e + w - b_i') + g_i^{\text{spite}}(e - b_i')\right) \\
\geq & \frac{1}{2}\left(f_i^{\text{spite}}(e + w - b_j) + f_i^{\text{spite}}(e - b_j)\right) - f_i^{\text{spite}}(e) .
\end{aligned} \tag{A.9}
$$

If $f_i^{\text{spite}}(\cdot) = g_i^{\text{spite}}(\cdot)$, the r.h.s. in (A.5) is strictly positive, whereas the l.h.s. is strictly negative – a contradiction. To see this, note that by Assumption 1, we have $\hat{b}_i > b_i^{\text{spite}}$ for the $\hat{b}_i$ solving the expression $\frac{1}{2} g_i^{\text{spite}}\left(e + w - \hat{b}_i\right) + \frac{1}{2} g_i^{\text{spite}}\left(e - \hat{b}_i\right) = g_i^{\text{spite}}(e)$, and when setting up inequality (A.8), we stipulated that i loses at $b_i^{\text{spite}} > b_j > b_i'$. Consider now the case $f_i^{\text{spite}}(\cdot) \neq g_i^{\text{spite}}(\cdot)$. Note that by the same reasoning, the expression on the l.h.s. of inequality (A.9) is strictly negative: Rearranging inequality (A.5) gives

$$
1 \leq \frac{\frac{1}{2} f_i^{\text{spite}}(e + w - b_j) + \frac{1}{2} f_i^{\text{spite}}(e - b_j) - f_i^{\text{spite}}(e)}{g_i^{\text{spite}}(e) - \frac{1}{2}\left(g_i^{\text{spite}}(e + w - b_i') + g_i^{\text{spite}}(e - b_i')\right)} . \tag{A.10}
$$

The numerator of this expression is strictly positive by the definition of b_i^* and $b_j < b_i^{\text{spite}}$, while the denominator is strictly negative as $b_i' < b_i^{\text{spite}}$. Thus, the r.h.s. of inequality (A.10) is strictly negative, which establishes the desired contradiction. ■

Proposition 1. *In the* VA*,*

(i) a selfish subject never has an incentive to deviate from b_i^{self};

(ii) an altruistic subject never has an incentive to overbid relative to b_i^{alt}, and might have an incentive to underbid;

(iii) a spiteful subjects never have an incentive to underbid relative to b_i^{spite}, and might have an incentive to overbid.

Proof. Proposition 1 follows from Lemmata 1–4 combined with the following observation. Let $\mu_i^d \in \Delta(B_j)$ be a belief (i.e., a probability distribution) of i about j's behaviour.

If $\mu_i^d\left(b_j'\right)$ is sufficiently large for some $b_j' > b_i^d$, then in case d = alt, i can increase her expected utility by submitting a bid $b_i' < b_i^{\text{alt}}$, while in case d = spite, i can increase her expected utility by submitting a bid $b_i' > b_i^{\text{spite}}$ ■

B Appendix: Instructions

In this appendix, we present the translations of the instructions, control questions, and decision sheets. For the two treatments, the instructions only differ in the section "The other bidder" in part 2 of the experiment. The original documents (in German) are available upon request.

Instructions:

Welcome to the experiment and thank you for agreeing to participate. This experiment is run by the Department of Economics and is funded by the Austrian Science Foundation. In a moment I will outline the decisions you'll face but first I have some preliminary announcements.

Please can you switch off your mobile phone. Throughout the duration of the experiment you are not allowed to use you mobile phone or to read any other material except that which is provided by the experiment. Please do not talk or attempt to communicate with any other participants. If, **at any point**, you have any questions regarding the experiment, raise your hand and someone will assist you. Failure to adhere by these rules will result in you being asked to leave and you will not be paid.

Any data collected from you will be used for research purposes only. Any reporting of this research makes no reference to your individual identity. In the data set created from this experiment you will exist solely as an I.D. number and not by name.

You will be paid at the end of the experiment in cash. The level of this payment depends on a combination of the decisions that you and others make.

This experiment consists of two parts: part A and part B. Part A involves answering a number of survey questions, and making a series of decisions about distributing money between yourself and another person. Part B involves bidding for a lottery in an auction. It is important to note that all of you will only be paid for one part of the experiment – either part A or part B. Which part will be paid for real will be determined randomly at the end of the experiment once all decisions have been made.

At the end of the experiment we will flip a coin. If it is heads, then you will all be paid for the decisions made in part A, but not for the decisions made in part B. If it is tails, then you will all be paid for the decisions made in part B, but not for the decisions made in part A. Hence, only one part of the experiment is ever paid for real.

Part Ai:

From this point onwards we will refer to this room as "Room 1" and the other room as "Room 2". The individuals in Room 2 are given the same instructions and face exactly the same decisions as all of you do in Room 1. This part of the experiment involves decisions made about the allocation of money between two individuals. These two individuals are referred to as pairs. Every pair always contains one person from Room 1 and one person from Room 2. Every pair contains one **active person**, who makes binding decisions, and one **passive person**, who makes no decisions.

You are a member of two different pairs.

- **Pair 1**: In the first pair you are a member of you are an **active person**. You are required to make a series of ten decisions about the allocation of money between yourself and the **passive person** of this pair, who is situated in Room 2 – this person is referred to as **your passive person**.
- **Pair 2**: In the second pair you are a member of you are a **passive person**. Here, the **active person** of this pair, who is situated in Room 2 and is referred to as **your active person**, is required to make the same ten decisions that you made in Pair 1 about the allocation of money between themselves and you.

Your active person and **your passive person** are two separate individuals who have both been chosen randomly. At no point will you ever discover their identities. Similarly, they will never discover your identity.

<u>Your choices as an **active person**</u>:
As an active person in Pair 1 your task is to make 10 separate decisions. Each decision is a choice between two options: **left** or **right**. Each option specifies an amount of money for you and an amount of money for **your passive person** in Room 2. The option **right** always pays €6.00 to you and €6.00 to **your passive person** in Room 2. The option **left** pays different amounts in each of the 10 decisions.
Consider the following example. Here you have the choice between option **right** which pays you €6 and **your passive person** €6, or option **left** which pays you €5 and **your passive person** €1. Such a choice is illustrated below. If you wish to choose option **left** then you would be required to place an X in the left circle. If you wish to choose option **right** then you would be required to place an X in the right circle.

Option: **Left**		Your Choice		Option: **Right**	
You receive	*Your passive person receives*	*Please choose either* ***left*** *or* ***right***		*You receive*	*Your passive person receives*
€5.00	€1.00	left ○	○ right	€6.00	€6.00

The table below outlines the ten decisions that you have to take.

	Option: **Left**		Your Choice		Option: **Right**	
Decision Number	*You receive*	*Your passive person receives*	*Please choose either **left** or **right***		*You receive*	*Your passive person receives*
1	€5.00	€11.00	left ○	○ right	€6.00	€6.00
2	€5.50	€11.00	left ○	○ right	€6.00	€6.00
3	€6.00	€11.00	left ○	○ right	€6.00	€6.00
4	€6.50	€11.00	left ○	○ right	€6.00	€6.00
5	€7.00	€11.00	left ○	○ right	€6.00	€6.00
6	€5.00	€1.00	left ○	○ right	€6.00	€6.00
7	€5.50	€1.00	left ○	○ right	€6.00	€6.00
8	€6.00	€1.00	left ○	○ right	€6.00	€6.00
9	€6.50	€1.00	left ○	○ right	€6.00	€6.00
10	€7.00	€1.00	left ○	○ right	€6.00	€6.00

<u>Your payment</u>:
You will receive two separate payments from this part of the experiment: one as an **active person** and one as a **passive person**.

- Payment as an **active person**: of the ten decisions you make as an **active person**, one of them will be chosen at random. For this single randomly chosen decision you will be paid the corresponding amount determined by your decision, as will **your passive person** in Room 2.
- Payment as a **passive person**: of the ten decisions **your active person** in Room 2 makes, one of them will be chosen at random. For this single randomly chosen decision you will be paid the corresponding amount determined by their decision, as will **your active person** in Room 2.

The two paid decisions are chosen independently. They are randomly drawn from a uniform distribution. This means as an **active person** each decision number has the same 10% chance of being paid for real. Similarly, as a **passive person** each of the ten decision numbers have the same 10% chance of being paid for real.

Questions:

In order to check your understanding of these instructions, please answer the following questions. You will not be able to proceed with the decision task until you have answered all the questions correctly. If there is any part of the instructions that need clarification then please raise your hand and someone will assist you.

Question 1:

Imagine that you chose right for decision number 4 and that this decision is the one randomly chosen to be paid.

How much will you receive as an active person from this situation?______________________

How much will your passive person receive from this situation?_________________________

Question 2:

Imagine that you chose left for decision number 7 and that this decision is the one randomly chosen to be paid.

How much will you receive as an active person from this situation?______________________

How much will your passive person receive from this situation?_________________________

Question 3:

Imagine that as an active person you chose left for decision number 1 and that this decision is the one randomly chosen to be paid. Imagine that as a passive person your active person chose left for decision number 10 and that this is the decision randomly chosen to be paid

How much will you receive as an active person from this situation?______________________

How much will you receive as a passive person from this situation?______________________

How much will your total payment be?____

Part Ai: Decision Sheet

Please write your experimental ID number here: ____________________

If your experimental ID number is missing or wrong then we will not be able to calculate your payment.

The following table outlines the 10 decisions you are required to make. For each row of the table please indicate with an X whether you prefer option **left** or option **right**. Please consider your answers and take your time. You have 5 minutes within which to make all ten decisions.

Option: **Left**		Your Choice		Option: **Right**	
You receive	*Your passive person receives*	*Please choose either **left** or **right***		*You receive*	*Your passive person receives*
€5.00	€1.00	left ○	○ right	€6.00	€6.00
€5.50	€1.00	left ○	○ right	€6.00	€6.00
€6.00	€1.00	left ○	○ right	€6.00	€6.00
€6.50	€1.00	left ○	○ right	€6.00	€6.00
€7.00	€1.00	left ○	○ right	€6.00	€6.00
€5.00	€11.00	left ○	○ right	€6.00	€6.00
€5.50	€11.00	left ○	○ right	€6.00	€6.00
€6.00	€11.00	left ○	○ right	€6.00	€6.00
€6.50	€11.00	left ○	○ right	€6.00	€6.00
€7.00	€11.00	left ○	○ right	€6.00	€6.00

Once you have made all ten choices, please place this decision sheet in the envelope provided.

Part Aii:

For Part Aii of the experiment you are required to answer 15 survey questions. Some of these questions ask for objective information about you (e.g. age, gender, etc.), some ask about your opinions and beliefs, and a third set of questions are factual questions, in that they have a specific correct answer.
The factual questions are paid, meaning that if you provide the correct answer, or if you are close enough to the correct answer, then you can earn some additional money. Any money earnt from providing correct answers to the factual questions in the survey will be added to the money you are paid from Part Ai of the experiment. The sum of these two amounts (i.e. Part Ai +Part Aii) will be the total payment for Part A of the experiment.

Please consider you answers and take your time. You have 10 minutes within which to answer the 15 questions.

Please write your experimental ID number here: ____________________

If your experimental ID number is missing or wrong then we will not be able to calculate your payment.

Question 1:
How old are you? _______________________

Question 2:
Are you male or female? _______________________

Question 3:
How many brothers and sisters do you have? _______________________

Question 4:
Are you left or right handed? _______________________

Question 5:
What is your nationality? _______________________

Question 6:

Do you currently have a part-time job: Please circle your answer: YES / NO

If YES, then in an average week how many hours do you spend in paid employment?

____

Question 7:

Over the last year, what has been you average monthly income. Include income from all sources (e.g. government grant, government loan, wages from employment, money from parents, etc). Please state your answer to the nearest one hundred euros.

€______________________

Question 8:

In Austria, do you think that poor people currently pay: a) too much tax, b) about the right amount of tax, or c) too little tax? Please circle your answer.

a)	b)	c)
The poor pay too much tax	The poor pay about the right amount of tax	The poor pay too little tax

Question 9:

In Austria, do you think that rich people currently pay: a) too much tax, b) about the right amount of tax, or c) too little tax? Please circle your answer.

a)	b)	c)
The rich pay too much tax	The rich pay about the right amount of tax	The rich pay too little tax

Question 10: (paid)

A recent study involved a number of wallets being left in various different urban locations throughout Austria. Each wallet contained €50 and the name and address of the owner. What percentage of these wallets do you think were returned to their owner intact?

______________________%

** if your answer is within plus or minus 10% of the correct answer then you will earn €1 **

Question 11:

Some people think that the government should do everything possible to improve the standard of living of all poor Austrians (they are at point 6). Other people think it's not the government's responsibility and that each person should take care of themself (they are at point 1). Where are you placing yourself in this scale? Please circle one of the following six options:

1	2	3	4	5	6
People should take care of themselves					Government should do everything possible

Question 12:

Some people say that people get ahead by their own hard work, other people say that lucky breaks or help from other people are more important – which do you think is most important? Please circle your answer.

1	2
Hard Work	Luck

Question 13:

When you graduate from university, what do you expect your net (i.e. after tax) annual salary to be for your first fulltime job? We are asking for annual salary <u>not</u> monthly salary.

€______________________

Question 14:

Imagine a ladder with 10 rungs. There are approximately 5 million Austrians of working age – that is aged between 16 and 65. These 5 million Austrians are uniformly distributed across the ladder. This means that there are 500,000 people on each rung of the ladder. They are arranged on the ladder by annual income, starting with the poorest. This means that on the first rung are the poorest 500,000 people – i.e. those with the lowest annual income. On the 10^{th} rung stand the richest 500,000 people – i.e. those with the highest annual income.

1	2	3	4	5	6	7	8	9	10
Poorest 500,000 Austrians of working age									Richest 500,000 Austrians of working age

Question 14a: (paid)

What is the net (i.e. after tax) annual income of the median person? The median person is the individual that stands exactly in the middle of the ladder, in between rungs 5 and 6. They have 2.5 million people richer than them and 2.5 million people poorer than them. (Remember, we are asking for annual income (after tax), not monthly income)

€________________________

** if your answer is within plus or minus 10% of the correct answer then you will earn €1 **

Question 14b:

What rung are you currently on? Please circle your answer.

1	2	3	4	5	6	7	8	9	10
Poorest 500,000 Austrians of working age									Richest 500,000 Austrians of working age

Question 14c:

In ten years time what rung do you expect to be on? Please circle your answer.

1	2	3	4	5	6	7	8	9	10
Poorest 500,000 Austrians of working age									Richest 500,000 Austrians of working age

Question 15: (paid)

Please place an X in any one, but only one, of the following three circles.

** if you do this successfully you will earn €0.50 **

Once you have answered all of the questions, please place this survey in the envelope provided.

Part B:
For part B of the experiment you are all required to make just one decision. That decision is to decide how much you would like to bid for a **Lottery** in an auction. As in Part A, all participants in both Room 1 and Room 2 are given the same instructions and face exactly the same decision.
The type of auction we will use is called a *two-bidder second-price auction*. The important point of this type of auction is that: **the highest bidder wins, but they only have to pay a price equal to the lowest bid**. – hence the name *second-price auction*.

The exact setup is as follows:

You each begin this part of the experiment by being given €10. This €10 is referred to as your **endowment**.
The decision you have to make is to decide how much you would like to bid in order to win the chance to play a **Lottery**. Permissible bids cover the full range of your **endowment** in increments of €0.10. This means that there are 101 possible bids that you can make, ranging from the lowest possible bid of €0.00 to the highest possible bid of €10.00 – i.e. the following bids are possible: €0.00; €0.10; €0.20; €0.30;.….; €9.70; €9.80; €9.90; €10.00.

<u>The Lottery</u>:
What you are bidding for is the opportunity to play a **Lottery**. The **Lottery** pays one of two possible prizes, a green prize or a yellow prize. Each prize has the same 50% probability of occurrence. The green prize pays €15.00 and occurs with probability one half. The yellow prize pays €0.00, and occurs with probability one half.
The way the **Lottery** is played in practice is as follows:
There is a bag containing two balls: one green ball and one yellow ball. If you have won the auction, then you will be asked to place your hand inside the bag and pull out one of the balls. If this ball is green then you have won €15, if this ball is yellow then you have won €0.
This draw will be conducted separately for each person that wins the auction. All draws are conducted in private.

<u>The Auction</u>:
Every auction consists of two bidders. Both you and the **other bidder** submit a bid in the range of €0 to €10. The rules of the auction are as follows:

- A winning bid is the highest of the two bids.
- A losing bid is the lowest of the two bids.
- A winning bidder buys the right to play the **Lottery**.
- The price a winning bidder pays in order to play the **Lottery** is not their own bid. The winning bidder pays a price equal to the losing bid – i.e. the lower of the two bids.
- The losing bidder does not get to play the **Lottery** and keeps all of their endowment.

Hence, the bid you make defines the maximum you will ever have to pay for the right to play the **Lottery**.

What happens if both bids are the same? If both bids are identical then the winning bidder will be determined by a coin toss. Hence, if both bids are identical then you have a 50% chance of being a winning bidder and a 50% chance of being a losing bidder.

The Other Bidder:
The **other bidder** is not an actual person, it is just a **random number**. The **random number** is drawn from a uniform distribution over the range €0 to €10, in increments of €0.10. This means that the **random number** can take any one of 101 possible values and that each of the 101 possible values are equally likely to occur – each value occurs with approximately 1% chance.
The way the **random number** is generated in practice is as follows:
After you have submitted your bid, you will be asked to choose two cards: one white card and one yellow card. The cards all have numbers on them. There are ten white cards which have numbers of euros printed on them of: €0; €1; €2; €3; €4; €5; €6; €7; €8; and €9. There are eleven yellow cards which have numbers of cents printed on them of: 0c; 10c; 20c; 30c; 40c; 50c; 60c; 70c; 80c; 90c and 100c. The cards are placed face down so you cannot see the numbers. The sum of the white card you pick plus the yellow card you pick is the **random number**, which determines the value of the bid of the **other bidder**.

The Other Bidder:
The **other bidder** is an individual situated in Room 2. The **other bidder** has been given the same endowment and the same instructions as you and they face exactly the same decision. They have been chosen randomly from a uniform distribution. This means every individual in Room 2 has the same probability of being paired with you for the auction. At no point will you ever discover their identity. Similarly, they will never discover your identity.

Your Payment:
If you lose the auction you keep all of your endowment. Therefore, you are paid €10.
If you win the auction, then you keep your endowment, minus the losing bid, plus the outcome of the Lottery.
Lose Auction = €10
Win Auction = €10 – (losing bid) + (outcome of the Lottery)

Questions:

In order to check your understanding of these instructions, please answer the following questions. You will not be able to proceed with the decision task until you have answered all the questions correctly. If there is any part of the instructions that need clarification then please raise your hand and someone will assist you.

Question 1:

Person A bids €5.00 in the auction.

What is the most Person A will ever have to pay for the Lottery?______________________

What is the least Person A will ever have to pay for the Lottery?______________________

What is the most amount of money Person A can earn in Part B?______________________

What is the least amount of money Person A can earn in Part B?______________________

Question 2:

Person A bids €2.30, the random number is €4.70, the result of the Lottery is green.

Does person A win the opportunity to play the Lottery (yes/non) ?______________________

If yes, how much do they Pay?______________________

What is the total payment from Part B for Person A?______________________

Question 3:

Person A bids €9.80, the random number is €9.10, the result of the Lottery is yellow.

Does person A win the opportunity to play the Lottery (yes/non) ?______________________

If yes, how much do they Pay?______________________

What is the total payment from Part B for Person A?______________________

Question 4:

Person A bids €9.80, the random number is €0.00, the result of the Lottery is green.

Does person A win the opportunity to play the Lottery (yes/non) ?______________________

If yes, how much do they Pay?______________________

What is the total payment from Part B for Person A?______________________

Questions:

In order to check your understanding of these instructions, please answer the following questions. You will not be able to proceed with the decision task until you have answered all the questions correctly. If there is any part of the instructions that need clarification then please raise your hand and someone will assist you.

Question 1:

Person A bids €5.00 in the auction.

What is the most Person A will ever have to pay for the Lottery?______________________

What is the least Person A will ever have to pay for the Lottery?______________________

What is the most amount of money Person A can earn in Part B?______________________

What is the least amount of money Person A can earn in Part B?______________________

Question 2:

Person A bids €2.30, Person B bids €4.70, the result of the Lottery is green.

Who wins the auction?______________________

What price do they pay to play the Lottery?______________________

What is the total payment from Part B for Person A?______________________

What is the total payment from Part B for Person B?______________________

Question 3:

Person A bids €9.80, Person B bids €9.10, the result of the Lottery is green.

Who wins the auction?______________________

What price do they pay to play the Lottery?______________________

What is the total payment from Part B for Person A?______________________

What is the total payment from Part B for Person B?______________________

Question 4:

Person A bids €9.80, Person B bids €0.00, the result of the Lottery is green.

Who wins the auction?______________________

What price do they pay to play the Lottery?______________________

What is the total payment from Part B for Person A?______________________

What is the total payment from Part B for Person B?______________________

Part B: Decision Sheet

Please write your experimental ID number here: ____________________

If your experimental ID number is missing or wrong then we will not be able to calculate your payment.

Please enter your bid in the space provided below. Permissible bids range from a minimum of €0.00 to a maximum of €10.00, in increments of €0.10. Please consider your decision and take your time. You have 5 minutes within which to your decision.

I would like to bid: ____________________

Once you have made your decision, please place this decision sheet in the envelope provided.