Time preference over other people's money

by

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Abstract. Research about time preference is often done in decision-making for yourself. Time discounting is traditionally modelled in form of exponential discounting, in which the discount rate over time is constant. While more recently research have shown that discount rates decline over time and follows the pattern of hyperbolic discounting. Would people make the same decisions about money in relation to their own preferences, when they have to make the decision for relatives and for strangers? This paper examines time stationarity in decision-making for yourself, for relatives and for strangers. This paper will also examine if the magnitude effect, sign effect and sequence effect hold in decision-making for yourself, for relatives and for strangers. The findings of this research are that there is some evidence for time stationarity in decision-making for yourself, relatives and strangers. Also the sign effect holds in decision-making for yourself, relatives and strangers. The magnitude effect only holds in case of decision-making for yourself, while the sequence effect does not hold in decision-making for yourself, relatives and strangers.

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Introduction

Behavioural economics has become a very important part of the economy. More than in the past, economic researchers are now more interested in the reasoning behind economic and financial decisions that people make. Based on the psychology of human behaviour, behaviour economics shows how decision-making can be improved using psychology. Especially during the recent financial and economic crisis the popularity of behavioural economics increased a lot.

The central topic of this paper is time preference. According to the literature, time preference is "the effect of the time of realization of an outcome on the relative desirability of the outcome." (Fishburn and Rubinstein, 1982, pp. 677) Discounted Utility Model (Samuelson, 1937) first assumes that people should have a constant discount rate, but experimental research by Thaler (1981) contradict this assumption and shows a pattern of hyperbolic discounting, which means that discount rates are not constant over time.

Shapiro (2010) and Abdellaoui, L'Haridon and Paraschiv (2011) have done research in the field of time preference. Their research is related to decision-making for yourself and decision-making in groups. What I want to find out in my research is if time preference over money is different in decision-making for yourself, for relatives and for complete strangers. Right now, there is a lack of research that compares decision-making for yourself, relatives and strangers. This research is focused on the time preference over other people's money. Therefore, the research question is:

Do people make different decisions in decision-making for yourself, relatives and strangers when time and money is involved?

To test whether people make different decisions the core hypothesis of this research is:

H0: *Time stationarity holds in decision-making for yourself, relatives and stranger; discount factors are the same over time.*

This hypothesis tests whether the discount factors differs in decision-making over time. Furthermore, there are some factors that influence time stationarity. Thaler (1981) reports that the sign effect and magnitude effect can influence the discount factor and Loewenstein and Sicherman (1991) report that the sequence effect can influence the discount factor. This research controls for these effects. Therefore the following hypothesises will be tested as well:

H0: *Magnitude effect does not hold; large amounts of money are discounted the same as small amounts of money.*

The hypothesis tests whether the discount factor for receiving a higher amount of money differs from the discount factor for receiving a lower amount of money. This hypothesis will be tested in decision-making for yourself, relatives and strangers.

H0: *Sign effect does not hold; gains are discounted the same as losses.*

This hypothesis tests whether the discount factor for receiving money is the same as the discount factor for paying money. The hypothesis will be tested in decision-making for yourself, relatives and stranger.

H0: *Sequence effect holds; people prefer improving sequences over declining sequences.*

The last hypothesis tests will be tested, test whether people prefer improving sequences over declining sequences. Here again, the hypothesis will be tested in decision-making for yourself, relatives and stranger.

The paper is organized as follows. Section one describes the literature overview; related literature will be discussed. Section two describes the methodology; the used methods to analyse time preference regarding people's own money and other people's money will be discussed. Section three describes the results; the statistical tests will be performed and discussed. Finally, section four describes the discussion and conclusion; the findings in the research will be discussed and compared with the related literature.

1. Literature Review

During the recent financial crisis decisions about own money has become more important. Even more than in the past, people will think twice before they make important decisions about spending their money. Research done by Chakravarty et. al (2005) shows that people are risk averse over their own money. How is people's risk attitude towards other people's money? The same research by Chakravarty et. al (2005) shows that people tend to exhibit less risk averse behaviour over other people's money. This indicates that people are willing to take more risk with other people's money in relation to their own money.

Related to the risk attitude is the intertemporal choice. Reviewed by Frederick, Loewenstein and O'Donoghue (2002), their paper shows that people discount their own money over time differently. Is time preference about other people's money similar to time preference about people's own money? Right now, there is a lack of research about time preference over other people's money. With related research and the economic situation right now time preference over other people's money should be an interesting topic to do research on.

This section evaluates and provides an overview of academic research of risk attitude and intertemporal choices: time discounting and time preference.

1.1 Risk Attitude

According to the prospect theory of Kahneman and Tversky (1979) people are risk averse when they prefer a certain 'save' outcome over a risky outcome, and someone is risk seeking when they prefer a risky outcome over a certain 'save' outcome.

A laboratory experiment by Chakravarty et.al (2011) shows that an individual behave significantly different when they make a decision about other people's money, related to his own preferences. Furthermore, the same research shows that people are risk averse for their own money. In the experiment, Chakravarty et al. (2011) found evidence that if an individual makes a decision for a stranger, they are less risk averse when making decisions over other people's money. Thus, people are willing to take more risk with other people's money in relation to their own money.

1.2 Intertemporal Choice: Time Preference and Time Discounting

The publication of *The Sociological Theory of Capital,* written by John Rae (1834), can be seen as the introduction of the theory about Intertemporal Choice. Intertemporal choice describes how time dimension affect people's decisions. Related to intertemporal choice is time preference and time discounting. Time preference and time discounting are in definition very close to each other.

According to Frederick, Loewenstein and O'Donoghue (2002) *time preference* can be described as: "the preference for immediate utility over delayed utility" (Frederick, Loewenstein and O'Donoghue, 2002, p. 352) and *time discounting* as: "any reason for caring less about a future consequence, including factors that diminish the expected utility generated by a future consequence, such as uncertainty or changing tastes" (Frederick, Loewenstein and O'Donoghue, 2002, p. 352).

One of the fundamentals of intertemporal choices as we know it now is the Discounted Utility (DU) model, introduced by Paul Samuelson in 1937. In this model all the motives underlying intertemporal choices are captured in the discount rate.

According to the paper by Frederick, Loewenstein and O'Donoghue (2002) the DU model is based on the following assumptions:

I. The intertemporal utility function can be described as follows:

$$U^t(c_t,\ldots,c_T) = \sum_{k=0}^{T-t} D(k)u(c_{t+k})$$
$$\text{where } D(k) = \left(\frac{1}{1+\rho}\right)^k.$$

II. People evaluate new alternatives by integrating them with existing plans;
III. The overall value of a sequence of outcome is equal to the (discounted) sum of the utilities in each period;
IV. The wealth in period t + k is independent of the consumption in any other period;
V. The discount factor is invariant across all forms of consumption;
VI. Constant period discount rate.

Reviewed by Frederick, Loewenstein and O'Donoghue (2002), some of the assumptions in the DU model are contradicted. The DU model assumes that discount rates are constant over time. Empirical research (Thaler, 1981) shows that discount rates decline over time and follows the pattern of hyperbolic discounting, which means that time preference is decreasing over time.

The DU model also assumes that discount rates are the same for all forms of intertemporal choice. Thaler (1981), and more studies, showed that discount rates vary across different forms of intertemporal choices. This is explained by the following effects:

- Sign effect: gains are discounted more than losses;
- Magnitude effect: small amounts are discounted more than large amounts;

- Delay-speedup asymmetry: greater discounting is shown to avoid delay of a good than to expedite its receipt;
- People prefer improving sequences over declining sequences;
- People prefer to spread consumption over time.

As mentioned before, the DU model assumes that people's own time preference can be found by measuring the discount rate. There are many studies that have measured this discount rate. Reviewed by Frederick, Loewenstein and O'Donoghue (2002) there are factors that can influence people's time preference:

- Intertemporal arbitrage: using the market interest rate, money can be saved;
- Concave Utility: estimates of time preference will be biased upwards when the utility function is concave;
- Uncertainty: delay is associated with uncertainty, so do you really get the money if you wait;
- Inflation: due to inflation the same amount of money you will receive in five year is lower than you would receive now;
- Expectations of Changing Utility: a reward of € 100 now might generate more utility than the same amount in five years, because your reference point can change during that period.

So far, I have discussed the theory of intertemporal choices for individuals about their own preferences. The DU model assumes that discount rates are constant over time, but there is evidence that peoples time preference decline over time. Do preferences change if people make choices for other people or if people make choices in groups? Empirical research by Shapiro (2010) indicate that discount rates are slightly smaller in the individual choice as compared to when people make decisions in groups or when they make decisions for a partner. According to the same research by Shapiro (2010) people discount their partner's payoff less if they know their partner. If they do not know their partner the weekly discount rate is 10% higher than when they do know their partner. People who know their partner also discount their own payoff less. So, in general, people are more patient when making decisions for their partners.

Abdellaoui, L'Haridon and Paraschiv (2011) have done similar research. They studied the risk and time preference in couples. In their research they found that the annual discount rates for individuals and couples first increase and then decrease over time. This suggests that there is increasing impatience between the present and a three month delay and there is decreasing impatience between a three months delay and a two year delay. Furthermore, when couples take the decisions together they appear to discount future amounts of money less as compared when the partners make the decision alone. So, this suggest that making decisions together reduce impatience.

To sum up, people tend to be more risk averse over their own money and less risk averse over other people's money. According to the DU model, people should have constant discount rate, but research contradict this assumption and shown a pattern of hyperbolic discounting. Most of the research is done for people's own preferences. Recent research shows that time preference differs in groups and pairs, when you compare this with people's own time preference. Should this also be the case with time preference about other people's money? That is what I want to find out in the rest of the research.

2. Methodology

This section describes the methods I used to analyse time preference regarding people's own money and other people's money. As mentioned in the previous section, research by Shapiro (2010) indicate that discount rates are slightly smaller in the individual choice as compared when people make decisions in groups or when they make decisions for a partner. In this study I want to examine if the discount factor for time preference is different when people make decisions about other people's money. The difference between decisions for yourself, for relatives and for strangers will be examined. Furthermore, the analysis also controls for the magnitude effect, sign effect and sequence effect.

For the analysis of time preference I made a questionnaire. A copy of this questionnaire is given in appendix A. A detailed description of the questions and explanation of why the questions are used is given in each description of the methods.

2.1 Time preference

To examine if there is a difference in time preference over people's own money and over other people's money, I used a simplified version of the methodology of Hold and Laury (2002). In order to calculate the risk aversion Hold and Laury (2002) made a choice list of ten paired lottery-choice decisions. In my research I will use a similar multiple price list (MPL) to calculate the interval of the discount factor. Rather than paired lottery-choice decisions I will use the MPL with a fixed amount of money right now (option A) and a variable amount of money with a delay (option B).

In order to calculate the time preference, I will compute the interval of the discount factors rather than an exact discount factor. Asking for someone's indifference point can give more confusion and errors by the participants. Using the simple presentation of the MPL reduce the confusion and errors. A drawback of this procedure is that the discount factor interval is less precise. Studies by Harrison, Lau & Williams (2002), Hesketh (2000) and Coller & Williams (1999) used a similar approach to calculate the interval of discount factors.

To determine the discount factor interval I asked the participants to fill in two different MPL which are reproduced in table 1 and table 2. In the first MPL (table 1) participants have to choose between receiving a fixed amount of money right now or a variable amount of money with one week delay, and the second MPL (table 2) offered a fixed amount of money in one week and a variable amount of money in two weeks. All participants offered eleven paired choices in each question.

Table 1. Time Preference: MPL 1

You participated to a lottery and you won an amount of money. The lottery company gives you two options to receive the amount of money you won. You can choose between option A and option B. Either you will *receive €20 right now* (option A), or you will receive *a variable amount of money in a week from now* (option B). Which option do you prefer? Each decision is a paired choice between "Option A" and "Option B" in every row.

Payoff alternative	Payment option A	Payment option B	Preferred payment option	
1	receive €20 right now	receive €17 in one week	A	B
2	receive €20 right now	receive €18 in one week	A	B
3	receive €20 right now	receive €19 in one week	A	B
4	receive €20 right now	receive €20 in one week	A	B
5	receive €20 right now	receive €21 in one week	A	B
6	receive €20 right now	receive €22 in one week	A	B
7	receive €20 right now	receive €23 in one week	A	B
8	receive €20 right now	receive €24 in one week	A	B
9	receive €20 right now	receive €25 in one week	A	B
10	receive €20 right now	receive €26 in one week	A	B
11	receive €20 right now	receive €27 in one week	A	B

Table 1 represents the first question of the questionnaire. All the participants of the survey are offered two options to receive the amount of money they won in a lottery. Either they receive €20 right now or they receive a variable amount of money in one week. The variable amount of money in one week started at €17 in the first payoff alternative and increased to €27 in the 11^{th} payoff alternative. I started with an amount of money in one week that is lower than the alternative payoff right now to give the participant the possibility to switch from option A to option B.

Table 2 represents the second question of the questionnaire. This question is very similar to the first question. The participants now have the option to receive €20 in one week and a variable amount of money from €17 to €27 in two weeks from now. Here again, I started with an amount of money in two weeks that is lower than the alternative payoff in one week to give the participant the possibility to switch from option A to option B.

Table 2. Time Preference: MPL 2

You participated to a lottery and you won an amount of money. The lottery company gives you two options to receive the amount of money you won. You can choose between option A and option B. Either you will receive €20 in one week (option A), or you will receive a variable amount of money in two weeks from now (option B). Which option do you prefer? Each decision is a paired choice between "Option A" and "Option B" in every row.				
Payoff alternative	Payment option A	Payment option B	Preferred payment option	
1	receive €20 in one week	receive €17 in two weeks	A	B
2	receive €20 in one week	receive €18 in two weeks	A	B
3	receive €20 in one week	receive €19 in two weeks	A	B
4	receive €20 in one week	receive €20 in two weeks	A	B
5	receive €20 in one week	receive €21 in two weeks	A	B
6	receive €20 in one week	receive €22 in two weeks	A	B
7	receive €20 in one week	receive €23 in two weeks	A	B
8	receive €20 in one week	receive €24 in two weeks	A	B
9	receive €20 in one week	receive €25 in two weeks	A	B
10	receive €20 in one week	receive €26 in two weeks	A	B
11	receive €20 in one week	receive €27 in two weeks	A	B

In order to calculate the discount factor interval participants have to fill in their preference in all the payoff alternative. The moment someone switch from option A to option B is the switching point where I am looking for to calculate the discount factor interval. To calculate the discount factor interval, I made some changes to the general discount function. The formula of the discount function is:

(1) $$D(k) = \pi^{k-1}{}_{n=0} \; (1 / 1 + \rho_n)$$ [1]

where ***D(k)*** is the discounted value, $\boldsymbol{\pi^{k-1}}$ is the value at time n, $\boldsymbol{\rho_n}$ is the per-period discount rate for period *n*. After rewriting the discount function, the formula that I use to analyse the data is the following:

(2) $$D(A) = (1 / 1 + \rho_n) * D(B)$$

where ***D(A)*** is the fixed amount of money in option A, $\boldsymbol{\rho_n}$ is the discount rate and ***D(B)*** is the variable amount of money in option B.

[1] **Frederick, S., Loewenstein, G., & O'Donoghue, T.** (2002). *Time Discounting and Time Preference: A Critical Review.* Journal of Economic Literature, Vol. 40, No. 2, pp. 358.

Example question one. Someone switch from option A to option B in payoff alternative seven. This means that he chooses for option A in payoff alternative one to six, and option B in payoff alternative seven to eleven. The interval of the discount factor is the last payoff alternative where someone chooses option A and the first payoff alternative where someone chooses option B.

Upper bound: $20 = (1 / 1 + \rho) * 22$, $\rho = 10\%$, *discount factor = 0,91*

Lower bound: $20 = (1 / 1 + \rho) * 23$, $\rho = 15\%$, *discount factor = 0,87*

So, the discount factor interval for someone that prefer to wait one week in order to receive a higher amount of money is between 0,91 and 0,87. The same methodology is used to calculate the discount factor interval with a fixed amount of money in one week and a variable amount of money in two weeks (table 2). To compare the discount factor with one week delay to the discount factor with two weeks delay, I will take the average of the discount factor interval. After calculating the average discount factor in both cases, I will compare the average discount factors with one week delay and two weeks delay in order to calculate the level of time preference.

In table 3 I reproduced question six, seven, eleven and twelve of the questionnaire. In questions six and eleven participants have to make the decision for relatives and strangers in receiving a fixed amount of money right now or a variable amount of money with one week delay. In questions seven and twelve participants have to make the decision for relatives and strangers in a fixed amount of money in one week and a variable amount of money in two weeks. The payoff alternatives are the same for questions six and eleven as in table 1 and for questions seven and twelve as in table 2.

Table 3. Time Preference: Relatives and Strangers

Question 6
One of your relatives (parents, grandparents, brother, or sister) participated to a lottery and he or she won an amount of money. The lottery company gives two options to receive the amount of money they won. They can choose between option A and option B. Either receive €20 right now (option A), or receive a variable amount of money in one week from now (option B). Your relative who won the lottery asks you to make the decision for him/her. Which option do you choose? Each decision is a paired choice between “Option A” and “Option B” in each row.
Question 7
One of your relatives (parents, grandparents, brother, or sister) participated to a lottery and he or she won an amount of money. The lottery company gives two options to receive the amount of money they won. They can choose between option A and option B. Either receive €20 in one week (option A), or receive a variable amount of money in two weeks from now (option B). Your relative who won the lottery asks you to make the decision for him/her. Which option do you choose? Each decision is a paired choice between "Option A" and "Option B" in each row.

Question 11

While you were walking outside, someone starts talking to you. This person, who is a complete stranger for you, tells that he won a lottery and that he can receive the money he won in two different ways. Either he receives €20 right now (option A), or he will receive a variable amount of money in one week from now (option B). The stranger asks you to make the decision for him. Which option do you choose? Each decision is a paired choice between "Option A" and "Option B" in each row.

Question 12

While you were walking outside, someone starts talking to you. This person, who is a complete stranger for you, tells that he won a lottery and that he can receive the money he won in two different ways. Either this person will receives €20 in one week (option A), or he will receive a variable amount of money in two weeks from now (option B). The stranger asks you to make the decision for him. Which option do you choose? Each decision is a paired choice between "Option A" and "Option B" in each row.

2.2 Magnitude Effect

According to empirical research by Thaler (1981) and Benzion, Rapoport and Yagil (1989) small amounts of money are discounted more than large amounts of money. This is called the magnitude effect. Does the magnitude effect also hold in case of time preference over other people's money?

To test the hypothesis that small amounts are discounted more than large amounts of money, I asked the participants to fill in a MPL where someone can win a fixed amount of €200 right now or a variable amount of money with one week delay in the range of €170 and €270. The MPL is reproduced in table 4.

Table 4. Magnitude Effect: MPL

You participated to a lottery and you won an amount of money. The lottery company gives you two options to receive the amount of money you won. You can choose between option A and option B. Either you will receive €200 right now (option A), or you will receive a variable amount of money in one week from now (option B). Which option do you choose? Each decision is a paired choice between "Option A" and "Option B" in every row.

Payoff alternative	Payment option A	Payment option B	Preferred payment option	
1	receive €200 right now	receive €170 in one week	A	B
2	receive €200 right now	receive €180 in one week	A	B
3	receive €200 right now	receive €190 in one week	A	B
4	receive €200 right now	receive €200 in one week	A	B
5	receive €200 right now	receive €210 in one week	A	B
6	receive €200 right now	receive €220 in one week	A	B
7	receive €200 right now	receive €230 in one week	A	B
8	receive €200 right now	receive €240 in one week	A	B

9	receive €200 right now	receive €250 in one week	A	B
10	receive €200 right now	receive €260 in one week	A	B
11	receive €200 right now	receive €270 in one week	A	B

Table 4 represent the third question of the questionnaire. All participants of the survey are offered two options to receive the amount of money they won in the lottery. Either they receive €200 right now or they receive a variable amount of money in one week. The amounts of money someone can win in the lottery are ten times higher than the payoff alternatives in the first question, where there is offered a fixed amount of money of €20 and a variable amount of money in one week from €17 to €27.

The average discount factor of the magnitude effect can be computed in the same way as described earlier in formula (2). To examine if the magnitude effect holds, the average discount factor of the high amounts of money (table 4) is compared with the average discount factor of the low amounts of money (table 1).

In questions eight and thirteen of the questionnaire the same question is asked for relatives and strangers. In these questions the participants have to make the decisions for their relatives and complete strangers. The questions are reproduces in table 5. The payoff alternatives are the same as in table 4.

Table 5. Magnitude effect: Relatives and Strangers

Question 8
One of your relatives (parents, grandparents, brother, or sister) participated to a lottery and he or she won an amount of money. The lottery company gives two options to receive the amount of money they won. They can choose between option A and option B. Either receive €200 right now (option A), or receive a variable amount of money in one week from now (option B). Your relative who won the lottery asks you to make the decision for him/her. Which option do you choose? Each decision is a paired choice between "Option A" and "Option B" in each row.
Question 13
While you were walking outside, someone starts talking to you. This person, who is a complete stranger for you, tells that he won a lottery and that he can receive the money he won in two different ways. Either this person will receives €200 right now (option A), or he will receives a variable amount of money in one week from now (option B). The stranger asks you to make the decision for him. Which option do you choose? Each decision is a paired choice between "Option A" and "Option B" in each row.

2.3 Sign Effect

"According to economic theory a person should be willing to pay the same amount to receive $100 a month sooner or to postpone paying $100 for a month." (Thaler, 1981, p.202) Empirical research by Thaler (1981) shows that gains are discounted different than losses. This describes the sign effect. Does the sign effect also hold in case of time preference over other people's money?

To test the hypothesis that gains are discounted differently than losses I asked the participants what they prefer in case of buying a jacket. To determine the discount factor interval in case of losing money I used a MPL with eleven paired choices. The MPL is reproduced in table 6.

Table 6. Sign Effect: MPL

You have seen a nice jacket and you want to buy this jacket. The store where you want to buy it gives you two options to pay for the jacket. Either you have to pay €20 right now (option A), or you have to pay a variable amount of money in one week from now (option B). Which option to pay for the jacket do you prefer? Each decision is a paired choice between "Option A" and "Option B" in every row.

Payoff alternative	Payment option A	Payment option B	Preferred payment option	
1	pay €20 right now	pay €17 in one week	A	B
2	pay €20 right now	pay €18 in one week	A	B
3	pay €20 right now	pay €19 in one week	A	B
4	pay €20 right now	pay €20 in one week	A	B
5	pay €20 right now	pay €21 in one week	A	B
6	pay €20 right now	pay €22 in one week	A	B
7	pay €20 right now	pay €23 in one week	A	B
8	pay €20 right now	pay €24 in one week	A	B
9	pay €20 right now	pay €25 in one week	A	B
10	pay €20 right now	pay €26 in one week	A	B
11	pay €20 right now	pay €27 in one week	A	B

Table 6 represent the fourth question of the questionnaire. All participants of the survey are offered two options to pay for a jacket they want to buy. Either they pay €20 right now or they pay a variable amount of money in one week. This variable amount of money in one week started at €17 in the first payoff alternative and increased to €27 in the 11^{th} payoff alternative. I started with an amount of money in one week that is lower than the alternative payoff right now to give the participant the possibility to switch from option B to option A.

Calculating the discount factor interval is similar to the method used in calculating the discount factor interval for time preference. Using formula (3) the discount factor interval for the sign effect can be computed.

(3) $D(B) = (1 / 1 + \rho_n) * D(A)$

where ***D(B)*** is the variable amount of money in option B, $\boldsymbol{\rho_n}$ is the discount rate and ***D(A)*** is the fixed amount of money in option A. Here again the interval of the discount factor is the last payoff alternative where someone choose option B and the first payoff alternative where someone choose option A. In order to see if the sign effect holds, the discount factor interval of paying money (table 6) is compared with the discount factor interval of receiving money (table 1).

In questions nine and fourteen of the questionnaire the same question is asked for relatives and strangers. In these questions the participants have to make the decisions for their relatives and complete strangers. The questions are reproduces in table 7. The payoff alternatives are the same as in table 6.

Table 7. Sign effect: Relatives and Strangers

Question 9
You were shopping with your brother or sister and he or she wants to buy a jacket. The store where you are gives two options to pay for the jacket. Either your brother or sister has to pay €20 right now (option A), or he/she has to pay a variable amount of money in one week from now (option B). Your brother or sister asks you to make the decision for him/her. Which option to pay for the jacket do you prefer? Each decision is a paired choice between "Option A" and "Option B" in each row.
Question 14
While you were walking in a shopping mall, someone starts talking to you. This person, who is a complete stranger for you, tells that he want to buy a jacket. The store where he wants to buy the jacket gives him two options to pay for it. Either he has to pay €20 right now (option A), or he has to pay a variable amount of money in one week from now (option B). The person asks you to make the decision for him. Which option do you choose? Each decision is a paired choice between "Option A" and "Option B" in each row.

2.4 Sequence Effect

Frederick, Loewerstein and O'Donoghue (2002) describe in their review paper the sequence effect as follow: "In studies of discounting that involve choices between two outcomes –e.g., X at *t* vs. Y at *t*'– positive discounting is the norm. Research examining preference over sequences of outcomes, however, has generally found that people prefer improving sequences to declining sequences." (Frederick, Loewenstein & O'Donoghue, 2002, p. 363) Research by Loewenstein and Sicherman (1991) and Loewenstein and Prelec (1993) showed that the sequence effect holds in many different

cases. For example, in identical jobs an increasing wage profile is preferred and in case of two or more events, the better event is saved for last.

Does the sequence effect also holds in case of winning a certain amount of money? To test this I gave the participants two options to receive €60 divided over three weeks. The question is reproduced in table 8.

Table 8. Sequence effect: MC

You participated to a lottery and you won € 60,--. The lottery company gives you two options to receive this amount of money. You can choose between option A and option B. Either you will receive €10 in the first week, €20 in the second week and €30 in the third week (option A), or you will receive €30 in the first week, €20 in the second week and €10 In the third week (option B). Which option do you prefer?

Payoff alternative	Payment option A	Payment option B	Preferred payment option	
1	receive € 10 in one week and, receive € 20 in two weeks and, receive € 30 in three weeks	receive € 30 in one week and, receive € 20 in two weeks and, receive € 10 in three weeks	A	B

According to research by Loewenstein and Sicherman (1991) and Loewenstein and Prelec (1993), the participants should choose option A.

In questions ten and fifteen of the questionnaire the same question is asked for relatives and strangers. In these questions the participants have to make the decisions for their relatives and complete strangers. The questions are reproduces in table 9. The payoff alternative is the same as in table 8.

Table 9. Sequence effect: Relatives and Strangers

Question 10

One of your relatives (parents, grandparents, brother, or sister) participated to a lottery and he or she won €60,--. The lottery company gives two options to receive the amount of money they won. They can choose between option A and option B. Either receive €10 in the first week, €20 in the second week and €30 in the third week (option A), or receive €30 in the first week, €20 in the second week and €10 In the third week (option B). You relative ask you to make the choice for him/her. Which option do you choose?

Question 15

While you were walking outside, someone starts talking to you. This person, who is a complete stranger for you, tells that he won a lottery and that he can receive the money he won in two different ways. He can choose between option A and option B. Either he will receive €10 in the first week, €20 in the second week and €30 in the third week (option A), or he will receive €30 in the first week, €20 in the second week and €10 In the third week (option B). This person asks you to make the decision for him. Which option do you choose?

3. Results

In this section the results of the analysis, as described in the methodology, will be tested. In total 91 people participated in the research and filled in the questionnaire. Some participants did not completed the questionnaire. They, for example, only completed the first three questions. I removed these questionnaires from the subject pool. Also, there were participants who answered the questions in a wrong way. They only gave their preferences in one of the eleven pay-off alternatives. Here again, I removed these questionnaires from the subject pool. In total I removed 27 questionnaires from the subject pool.

After removing the questionnaires, the subject pool consists of 64 completed questionnaires. Table 10 shows the distribution male-female and the average age of the subject pool.

Table 10. Subject pool statistics

	Gender	
	Male	Female
N	44	20
Age Mean (years)	40	38
Age Minimum (years)	23	17
Age Maximum (years)	62	61

In the methodology is described which questions I have asked the participants. Most of these questions are asked in the form of a multiple price list (MPL). In these MPL someone has to choose between option A and option B. Most of the participants switched in the questions between the two options, but some of them did not switch. For the participants who did not switched, I cannot calculate their average discount factor because I only know their upper or under bound of the discount factor. I moved these questions out of the subject pool. Table 11 reports how many questions I removed from the subject pool and how many subjects are left for the analysis.

In table 11 every row stands for one of the questions of the questionnaire. *TP_base_self* stands for the question about the decision someone has to make for himself in receiving money direct or in one week. *TP_oneweek_self* stands for the question about the decision someone has to make for himself in receiving money in one week or in two weeks. *TP_magnitude_self* stands for the question about the magnitude effect, so the decision for yourself in receiving a higher amount of money direct or in one week. *TP_sign_self* stands for the question about the sign effect, so the decision for yourself in paying direct or in one week. *Sequence_self* stands for the question in making the decision for

yourself in receiving the money in an improving or declining sequence. The same questions are reported for relatives and strangers in the rest of the table respectively.

Table 11. Removed questions

	Removed questions		Total subject pool per question
	Number of questions	Percentage of total	
TP_base_self	1	1,56	63
TP_oneweek_self	2	3,13	62
TP_magnitude_self	0	0	64
TP_sign_self	17	26,56	47
Sequence_self	0	0	64
TP_base_relative	1	1,56	63
TP_oneweek_relative	2	3,13	62
TP_magnitude_relative	0	0	64
TP_sign_relative	14	23,44	50
Sequence_relative	0	0	64
TP_base_stranger	2	3,13	62
TP_oneweek_stranger	4	6,25	60
TP_magnitude_stranger	1	1,56	63
TP_sign_stranger	14	21,88	50
Sequence_stranger	0	0	64

Table 12 show the descriptive statistics of the discount factors in each question. Here again, the first column represents the questions of the questionnaire. The table reports the number of subjects in each question (N), minimum discount factor (minimum), maximum discount factor (maximum) and the mean discount factor (mean). Every row is related to one of the questions of the questionnaire.

Table 12. Descriptive statistics per question

	N	Minimum Discount factor	Maximum discount factor	Mean discount factor
TP_base_self	63	,8167	1,0263	,933296
TP_oneweek_self	62	,8167	1,0263	,932366
TP_magnitude_self	64	,8167	,9762	,960158
TP_sign_self	47	,9307	1,0263	,995785
TP_base_relative	63	,8167	1,0263	,952750
TP_oneweek_relative	62	,4654	1,0263	,940959
TP_magnitude_relative	64	,8167	,9762	,961263
TP_sign_relative	50	,9307	1,0819	,999517
TP_base_stranger	62	,8167	1,0263	,955548
TP_oneweek_stranger	60	,8167	,9762	,953140
TP_magnitude_stranger	63	,8167	,9762	,960561
TP_sign_stranger	51	,9307	1,0278	,997019

3.1 Time Preference

The time preference will be analysed by comparing the average discount factors when someone has to make the decisions between €20 right now or a variable amount of money from €17 to €27 in one week and €20 in one week or a variable amount of money from 17 to €27 in two weeks. The hypothesis that I will test is that time stationarity holds in decision-making for yourself, for relatives and for a stranger. Time stationarity means that the ranking of two temporal payments at time *t* only depends on the "payment distance" (e.g. €20 vs. €25) and the relative delay of the two payments (e.g. now or one week later vs. one week later or two weeks later), but do not depend on the distance from *t* (Halevy, 2012). The hypothesis can be set as follows:

H0: $\mu_1 = \mu_2$, average discount factors are the same

H1: $\mu_1 \neq \mu_2$, average discount factors are different

where μ_1 is the average discount factor, which is calculated from choosing between a fixed amount of money right now and a variable amount of money in one week and μ_2 is the average discount factor, which is calculated from choosing between a fixed amount of money in one week and a variable amount of money in two weeks.

To perform the tests I will use the non-parametric Wilcoxon signed rank test with related samples. I use this test because I want to compare two different samples; one sample with discount rates in one week delay and one sample with discount rates in two weeks delay. Table 13 reports the results of the Wilcoxon test.

Table 13. Time preference Test Statistics[b]

	TP_oneweek_self - TP_base_self	TP_oneweek_relative - TP_base_relative	TP_oneweek_stranger - TP_base_stranger
Z	-,226[a]	-,543[a]	-,166[a]
Asymp. Sig. (2-tailed)	,821	,587	,868

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test

The first test compares the average discount factors in decision-making for yourself. In this test the average discount factor with one week delay is compared with the discount factor with two weeks delay. The table shows a p-value of 0,821. This means that we cannot reject the hypothesis that the average discount factors are the same. So, there is no significant difference between the average discount factors. In this research it means that we do have some evidence for time stationarity.

The second test compares the average discount factors for receiving money with one week delay and two weeks delay in decision-making for relative. The p-value is 0.587. Here again, we cannot reject the hypothesis that the average discount factors are the same. In this research it means that there is no significant difference in the discount factors in receiving money with one week delay and two weeks delay, when someone has to make a decision for their mother, father, brother or sister. So, we do have some evidence that time stationarity holds.

The third test compares the average discount factors in receiving money with one week delay and with two weeks delay in decision-making for a complete stranger. The table shows a p-value of 0,868, which means that we cannot reject the hypothesis that there is no difference between the average discount factors. So there is no significant difference between the average discount factors in decision-making for a complete stranger. In this research it means that we do have evidence for time stationarity.

The next hypothesis tests whether there is no difference in the average discount factors if someone has to make the decision for yourself, relatives and a complete stranger in receiving an amount of money with one week delay. To test this hypothesis I compared the average discount factors in

receiving money right now or in one week in decision-making for yourself, relatives or a complete stranger. The hypothesis can be set as follows:

H0: $\mu_1 = \mu_2 = \mu_3$, average discount factors are the same

H1: one of the μ_i differs , one of the three average discount factors differs

where μ_1 is the average discount factor in decision-making for yourself, μ_2 in decision-making for a relative and μ_3 in decision-making for a complete stranger.

To perform the test I use the non-parametric Friedman test with related samples. I use this test to compare the average discount factors for more than two related samples. Table 14 report the results of the Friedman test.

Table 14. Test Statistics[a]

N	62
Chi-Square	9,800
df	2
Asymp. Sig.	,007

a. Friedman Test

The test statistics shows a p-value of 0,007, which means that I can reject the hypothesis that the average discount factors are the same with a 99% level of confidence ($\alpha = 0.01$). In this research it means that there is a significant difference between at least one the average discount factors in decision-making for yourself, for relatives and for complete strangers. This only holds in decision-making between receiving a fixed amount of money right now or a variable amount of money in one week.

The previous test showed that at least one of the average discount factors differs from the other two. Now I compare the average discount factors in receiving money right now or with one week delay in pairs. I compare the discount factors in decision-making for yourself with the decision-making for relatives, decision-making for yourself with decision-making for strangers and decision-making for relatives with decision-making for strangers. The hypothesis can be set as follows:

H0: $\mu_1 = \mu_2$, average discount factors are the same

H1: $\mu_1 \neq \mu_2$, average discount factors are different

Table 15 reports the Wilcoxon tests to see whether there is a difference in average discount factors between the three pairs. The test statistics shows that the average discount factors in receiving money with one week delay is significantly different in decision-making for yourself and for relatives. The same holds in decision-making for yourself and for strangers. The p-value is respectively 0,002 and 0,009. I can reject in both situations the hypothesis that the average discount factors are the same with a 99% level of confidence ($\alpha = 0.01$). In this research it means that we have evidence that the discount factors for receiving money with one week delay in decision-making for yourself is significantly different from decision-making for relatives and strangers separately.

Table 15. Time preference Test Statistics[b]

	TP_base_relative - TP_base_self	TP_base_stranger - TP_base_self	TP_base_stranger - TP_base_relative
Z	-3,083[a]	-2,613[a]	-,409[a]
Asymp. Sig. (2-tailed)	,002	,009	,683

a. Based on negative ranks.

b. Wilcoxon Signed Ranks Test

In case of decision-making for relatives and for strangers I cannot reject the hypothesis that the average discount factors are the same, which means that there is no evidence that the average discount factors for relatives and for strangers are different.

The next hypothesis test whether there is a difference in the average discount factors between yourself, relatives and a complete stranger for decision-making in receiving an amount of money with two weeks delay. To test the hypothesis I compared the average discount factors in receiving a fixed amount of money with one week delay and a variable amount of money with two weeks delay in decision-making for yourself, relatives or a complete stranger. The hypothesis can be set as follows:

H0: $\mu_1 = \mu_2 = \mu_3$, average discount factors are the same

H1: one of the μ_i differs , one of the three average discount factors differs

where μ_1 is the average discount factor in decision-making for yourself, μ_2 in decision-making for a relative and μ_3 in decision-making for a complete stranger.

Table 16 reports the results of the Friedman test. The p-value is 0,184, which means that we cannot reject the hypothesis that the average discount factors are the same. In this research it means that

there is no evidence that at least one of average discount factors in decision-making for yourself, relatives and strangers in receiving an amount of money with two weeks delay is different.

Table 16. Test Statistics[a]

N	60
Chi-Square	3,391
df	2
Asymp. Sig.	,184

a. Friedman Test

3.2 Magnitude Effect

As described in methodology, the magnitude effect holds when small amounts of money are discounted more than large amounts of money. To test if the magnitude effect holds I compared the average discount factor of someone that has to make the decision between €20 right now or a variable amount of money between €17 and €27 in one week and €200 right now or a variable amount of money between €170 and €270 in one week.

The hypothesis that I will test is that the average discount factors are the same. I will use the non-parametric Wilcoxon signed rank test to test the hypothesis. The hypothesis can be set as follows:

H0: $\mu_1 = \mu_2$, average discount factors are the same

H1: $\mu_1 \neq \mu_2$, average discount factors are different

where μ_1 is the average discount factor of the decision between €20 right now and a variable amount of money between €17 and €27 in one week and μ_2 is the average discount factor of the decision between €200 right now and a variable amount of money between €170 and €270 in one week.

Table 17. Magnitude effect Test Statistics[b]

	TP_magnitude_self - TP_base_self	TP_magnitude_relative - TP_base_relative	TP_magnitude_stranger - TP_base_stranger
Z	-2,902[a]	-,995[a]	-,722[a]
Asymp. Sig. (2-tailed)	,004	,320	,470

a. Based on negative ranks.

b. Wilcoxon Signed Ranks Test

In the case of making the decision for yourself, table 17 shows a p-value of 0,004. This means that I can reject the hypothesis that the average discount factors are the same with a 99% level of confidence ($\alpha = 0.01$). In this research it means that there is a significant difference between the average discount factor for the decision between €20 right now or a variable amount of money between € 17 and €27 in one week and €200 right now or a variable amount of money between €170 and €200 in one week. The p-value if someone has to make the decisions for relatives and for strangers is respectively 0.320 and 0.470. So we cannot reject the hypothesis that the average discount factors in these two cases are the same.

Table 18. Magnitude effect descriptive statistics

	N	Mean	Std. Deviation	Minimum	Maximum
TP_base_self	63	,933296	,0594186	,8167	1,0263
TP_magnitude_self	64	,960158	,0366379	,8167	,9762

The Wilcoxon test reported in table 17 shows that there is a significant difference between the discount factors when you make the decision for yourself. The descriptive statistics related to the Wilcoxon test (table 18) shows that the mean discount factor for receiving a variable amount of money between €17 and €27 in one week is 0,933296 and the mean discount factor for receiving a variable amount of money between €170 and €270 in one week 0,960158. Based on these data the magnitude effect for the decision for yourself in receiving money holds; large amounts of money are discounted less than small amounts of money.

3.3 Sign Effect

As described in the methodology, the sign effect holds when gains are discounted different than losses. To test if the sign effect holds I will compare the average discount factor of someone that has the decision between receiving €20 right now or a variable amount of money between €17 and €27 in one week and paying €20 right now or a variable amount of money between €17 and €27 in one week.

In the questions regarding the sign effect some participants only chose for option A; paying direct for the jacket and not one week later. These people prefer paying a higher amount of money now over paying a lower amount of money in one week, even when paying with a delay saves money. Table 19 reports how many subjects in all the pay-off alternatives chose only for option A.

Table 19. Sign effect

	All option A	Switched B to A	Total
Yourself	15	47	62
Relatives	11	50	62
Strangers	11	50	61

For these subjects I cannot calculate their average discount factor because I only know their upper bound. Hence, I left them out of the subject pool. The third column of table 19 shows how many subjects the analysis regarding the sign effect is based on.

The hypothesis that I will test is that gains are discounted the same as losses. I will use the Wilcoxon signed rank test to test the hypothesis. The hypothesis can be set as follows:

H0: $\mu_1 = \mu_2$, average discount factors are the same

H1: $\mu_1 \neq \mu_2$, average discount factors are different

Table 20. Sign effect Test Statistics[b]

	TP_sign_self - TP_base_self	TP_sign_relative - TP_base_relative	TP_sign_stranger - TP_base_stranger
Z	-5,113[a]	-5,017[a]	-4,706[a]
Asymp. Sig. (2-tailed)	,000	,000	,000

a. Based on negative ranks.

b. Wilcoxon Signed Ranks Test

The test statistics in table 20 shows a p-value of 0,000 in the cases of decision-making for yourself, relatives and complete strangers. This means that I can reject the hypothesis that the average discount factors are the same with a 99,9% level of confidence ($\alpha = 0.001$) in all the three decision-making situations. In this research it means that there is a significant difference between the average discount factor for the decision between receiving €20 right now or a variable amount of money between €17 and €27 in one week and paying €20 right now or a variable amount of money between €17 and €27 in one week. Based on these data the sign effect holds; gains are discounted different than losses.

So, the previous test showed that the sign effect holds in all the three different decision-making situations. The next test compares the average discount factors in decision-making for yourself,

relatives and strangers in decision-making when someone has to pay for a jacket. The hypothesis can be set as follows:

H0: $\mu_1 = \mu_2 = \mu_3$, average discount factors are the same

H1: one of the μ_i differs , one of the three average discount factors differs

where μ_1 is the average discount factor for paying an amount of money in one week in decision-making for yourself, μ_2 in decision-making for a relative and μ_3 in decision-making for a complete stranger. To test this hypothesis I perform the Friedman test with related samples.

Table 21. Test Statistics[a]

N	47
Chi-Square	,018
df	2
Asymp. Sig.	,991

a. Friedman Test

Table 21 reports the results of the Friedman test. Here the p-value is 0,991, which means that we cannot reject the hypothesis that the average discount factors are the same. In this research it means that the participants have the same attitude towards gains, but not towards losses.

3.4 Sequence Effect

As described in the methodology, the sequence effect holds when improving sequences is preferred over declining sequences. In this research it means that people should prefer €10 in the first week, €20 in the second week and €30 in the third week over €30 in the first week, €20 in the second week and € 10 in the third week.

To test if the sequence effect holds, I will first use the Wilcoxon signed rank test to test if one of the sequence is preferred over the other sequence. The hypothesis can be set as follows:

H0: $\mu_1 = \mu_2$, no sequence is preferred over the other sequence

H1: $\mu_1 \neq \mu_2$, one sequence if preferred over the other sequence

Table 22: Sequence effect Test Statistics[b]

	Declining_self - Improving_self	Declining_relative - Improving_relative	Declining_stranger - Improving_stranger
Z	-5,000[a]	-6,000[a]	-5,750[a]
Asymp. Sig. (2-tailed)	,000	,000	,000

a. Based on negative ranks.

b. Wilcoxon Signed Ranks Test

The test statistics in table 22 shows that in decision-making for yourself, relatives and strangers, one of the sequences is preferred over the other. The p-value in decision-making for yourself, relatives and strangers is in all the cases 0,000. This means that we can reject the hypothesis that no sequence is preferred over the other sequence with a 99,9% level of confidence ($\alpha = 0.001$).

Table 23 reports the distribution of participants that chose for improving sequences and declining sequences in receiving €60 in total. When someone makes the decision for himself, 18.75% prefers receiving €60 in improving sequences over declining sequences. For making the decision for relatives, only 12,5% prefers improving sequences. If someone has the decision for a complete stranger, 14.06% of the participants prefer improving sequences over declining sequence.

Table 23. Sequence effect preferred

	Improving sequences €10 - €20 - €30	Declining sequences €30 - €20 - €10	Total
Yourself	12	52	64
Relatives	8	56	64
Strangers	9	55	64

After combining the results of the test statistics in table 22 and the preferred sequences in table 23, we can say that in decision-making for yourself, relatives and stranger the sequence effect does not hold; participants prefer declining sequences over improving sequences.

4 Discussion and Conclusion

4.1 Time preference

The first findings in this paper are that there is evidence for time stationarity. I observed no significant differences in the average discount factors in receiving money with a delay of one week and a delay of two weeks. I compared the average discount factors with one week delay and two weeks delay in decision-making for yourself, for relatives and for complete strangers separately. I did found support for time stationarity in all of the three different decision-making situations.

These findings are in line with the Discounted Utility (DU) model, which Samuelson introduced in 1937. A central assumption of the DU model is constant discounting over time. Important remark is that related research by Thaler (1981) and Frederick, Loewenstein and O'Donoghue (2002) contradict the assumption of constant discounting in the DU model. Empirical research (Thaler, 1981) shows that discount rates decline over time and follows the pattern of hyperbolic discounting, which means that time preference is decreasing over time.

The average discount factor that I calculated by using the MPL is less precise than if I would use matching. It could be the case that when calculating the discount factor more precise, for example asking the indifference point, the results will be different. Furthermore, the experiment I used for collecting the data is based on an online questionnaire. Important in these experiments is the external validity; is what I observe in the experiment according to what could happen in the real world. Participants in my experiment made their decisions on the computer screen with no real stakes and could make different decisions when you compare this with a real world situation. An experiment based on real stakes in a real world situation could give more power to the research.

When comparing the average discount factors in decision-making for yourself, relatives and strangers in receiving money direct or in one week, I did found significant differences. The results show that decision-making for yourself compared with decision-making for relatives and for strangers separately differs. I did not found significant differences if decision-making for relatives and strangers are compared.

4.2 Magnitude effect

When analysing the magnitude effect, I found that my results are consistent with related research by Thaler (1981) and Benzion, Rapoport and Yagil (1989). The results show that the average discount factor with one week delay is lower for small amounts (€20) than for large amounts (€200). However, the magnitude effect only holds in decision-making for yourself. In case of decision-making for

relatives and strangers, the magnitude effect does not hold. So, in this research I found that in decision-making for yourself the height of the stakes influence the discount factors. In decision-making for relatives and strangers I found no evidence that the height of the stakes influence the discount factors.

4.3 Sign effect

The analysis shows that the sign effect holds in all the three decision-making situations. I found in my research that gains are discounted different than losses. These results are consistent with the empirical research by Thaler (1981). So, in decision-making for yourself, for relatives and for strangers I found evidence that the discount rates are influenced by gains and losses.

4.4 Sequence effect

The last findings in the paper are that the sequence effect does not hold in discount-making for yourself, for relatives and for strangers. The results show that the subjects prefer declining sequences over improving sequences. This is not in line with related research. Reviewed by Frederick, Loewerstein and O'Donoghue (2002) people should prefer improving sequences over declining sequences.

A reason for a different outcome in the sequence effect analysis could be due to the amount of money I used in the research. In my research participants received an amount of €60, while related research used higher amounts of money (salary) and products with a higher value than the amounts of money I used (going out for dinner). For example, in one of the related papers by Loewenstein and Sicherman (1991) the authors used upward or downward salary scheme. The impact of such a decision is much higher than the decision-making in receiving €60 in total. Another possible reason could be that the delay in my research is only one week between the payoffs, while for example the salary scheme is over many years.

4.5 Recommendation further research

Right now, we are still in an economic downturn. People are more patient in spending their money. Therefore, recommendation for further research is to perform a similar research in a period of good economic circumstances. The current economic situation could influence the results. It would be interested to see if people will make different choices over other people's money under better economic circumstances.

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Appendix

Appendix A: Copy questionnaire

Bedankt dat je wilt deelnemen aan dit onderzoek. Door het invullen van de vragenlijst draag je bij aan mijn masterthesis met als onderwerp time preference, de waardering van geld over tijd. Deze masterthesis is de laatste fase van de Master Behavioural Economics (gedragseconomie).

De vragenlijst bestaat uit 18 vragen en het invullen ervan duurt ongeveer 10 minuten. De vragenlijst start met een instructie waarin een voorbeeldvraag wordt gesteld en toegelicht. De antwoorden zijn afhankelijk van de keuzes die je maakt. Er zijn dus geen goede of foute antwoorden. De vragenlijst wordt anoniem ingevuld.

Start

Instructie

Je wordt gevraagd verschillende keuzes te maken uit optie A en optie B. De vragen zien er als volgt uit:

Je hebt een geldbedrag gewonnen en je kan kiezen uit twee opties om het gewonnen geldbedrag te ontvangen. Of je ontvangt direct € 10 (optie A), of je ontvangt een variabel geldbedrag over één week (optie B). Voor welke optie kies je? Maak een keuze uit optie A en optie B in elke rij.

€10 direct [ ] [ ] €7 over één week
€10 direct [ ] [ ] €8 over één week
€10 direct [ ] [ ] €9 over één week
€10 direct [ ] [ ] €10 over één week
€10 direct [ ] [ ] €11 over één week
€10 direct [ ] [ ] €12 over één week
€10 direct [ ] [ ] €13 over één week
€10 direct [ ] [ ] €14 over één week
€10 direct [ ] [ ] €15 over één week
€10 direct [ ] [ ] €16 over één week
€10 direct [ ] [ ] €17 over één week

Hierboven word je gevraagd in elke rij een keuze te maken tussen optie A en optie B. Optie A is constant is alle rijen; je ontvangt direct €10. Optie B verschilt in de geldbedragen die je ontvangt over één week. Je maakt je keuze door in elke rij de optie te kiezen die jij prefereert.

In de eerste rij is de kans groot dat je voor optie A kiest. Het bedrag dat je wordt geboden is groter dan in optie B en je ontvangt het geldbedrag eerder. Als je verder naar beneden gaat, wordt optie B steeds aantrekkelijker om te kiezen, omdat optie B een steeds groter geldbedrag over één week biedt. Op een gegeven moment kies je waarschijnlijk voor optie B. Als dit aan de orde is, kies je ook voor optie B in de rijen daaronder, omdat optie B steeds aantrekkelijker wordt. Hetzelfde geldt als je optie A kiest in een bepaalde rij. Je kiest dan in de rijen daarboven ook voor optie A, omdat optie B minder aantrekkelijk is.

Tot zover de instructie en voorbeeldvraag. Je kunt beginnen met de vragenlijst.

Start

BELANGRIJK: In de vragen 1 tot en met 5 maak JIJ de keuze voor JEZELF

1.

Vraag 1

Je hebt deelgenomen aan een loterij en hiermee een geldbedrag gewonnen. De loterij geeft je twee opties om je gewonnen geld te ontvangen. Je kan kiezen uit optie A en optie B. Of je ontvangt direct €20 (optie A), of je ontvangt een variabel geldbedrag over één week. Voor welke optie kies je? Maak een keuze uit optie A en optie B in elke rij.

ontvang €20 direct	◯ ◯	ontvang €17 over één week
ontvang €20 direct	◯ ◯	ontvang €18 over één week

ontvang €20 direct	◯ ◯	ontvang €19 over één week
ontvang €20 direct	◯ ◯	ontvang €20 over één week
ontvang €20 direct	◯ ◯	ontvang €21 over één week
ontvang €20 direct	◯ ◯	ontvang €22 over één week
ontvang €20 direct	◯ ◯	ontvang €23 over één week
ontvang €20 direct	◯ ◯	ontvang €24 over één week
ontvang €20 direct	◯ ◯	ontvang €25 over één week
ontvang €20 direct	◯ ◯	ontvang €26 over één week
ontvang €20 direct	◯ ◯	ontvang €27 over één week

2.

Vraag 2

Je hebt deelgenomen aan een loterij en hiermee een geldbedrag gewonnen. De loterij geeft je twee opties om je gewonnen geld te ontvangen. Je kan kiezen uit optie A en optie B. Of je ontvangt €20 over één week (optie A), of je ontvangt een variabel geldbedrag over twee weken (optie B). Voor welke optie kies je? Maak een keuze uit optie A en optie B in elke rij.

ontvang €20 over één week	◯ ◯	ontvang €17 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €18 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €19 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €20 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €21 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €22 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €23 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €24 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €25 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €26 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €27 over twee weken

3.

Vraag 3

Je hebt deelgenomen aan een loterij en hiermee een geldbedrag gewonnen. De loterij geeft je twee opties om je gewonnen geld te ontvangen. Je kan kiezen uit optie A en optie B. Of je ontvangt direct €200 (optie A), of je ontvangt een variabel bedrag over één week. Voor welke optie kies je? Maak een keuze uit optie A en optie B in elke rij.

ontvang €200 direct	◯ ◯	ontvang €170 over één week
ontvang €200 direct	◯ ◯	ontvang €180 over één week
ontvang €200 direct	◯ ◯	ontvang €190 over één week
ontvang €200 direct	◯ ◯	ontvang €200 over één week
ontvang €200 direct	◯ ◯	ontvang €210 over één week
ontvang €200 direct	◯ ◯	ontvang €220 over één week
ontvang €200 direct	◯ ◯	ontvang €230 over één week
ontvang €200 direct	◯ ◯	ontvang €240 over één week
ontvang €200 direct	◯ ◯	ontvang €250 over één week
ontvang €200 direct	◯ ◯	ontvang €260 over één week
ontvang €200 direct	◯ ◯	ontvang €270 over één week

4.

Vraag 4

Je hebt een jas gezien die je graag wilt kopen. De winkel waar je deze jas wilt kopen geeft je twee opties om ervoor te betalen. Of je betaalt direct €20 (optie A), of je betaalt een variabel bedrag over één week (optie B). Voor welke optie kies je om de jas te betalen? Maak een keuze uit optie A en optie B in elke rij.

betaal €20 direct	◯ ◯	betaal €17 over één week
betaal €20 direct	◯ ◯	betaal €18 over één week
betaal €20 direct	◯ ◯	betaal €19 over één week

betaal €20 direct	◯ ◯	betaal €20 over één week
betaal €20 direct	◯ ◯	betaal €21 over één week
betaal €20 direct	◯ ◯	betaal €22 over één week
betaal €20 direct	◯ ◯	betaal €23 over één week
betaal €20 direct	◯ ◯	betaal €24 over één week
betaal €20 direct	◯ ◯	betaal €25 over één week
betaal €20 direct	◯ ◯	betaal €26 over één week
betaal €20 direct	◯ ◯	betaal €27 over één week

5.

Vraag 5

Je hebt deelgenomen aan een loterij en hiermee € 60 gewonnen. De loterij geeft je twee opties om je gewonnen geld te ontvangen. Je kan kiezen uit optie A en optie B. Of je ontvangt €10 in de eerste week, €20 in de tweede week en €30 in de derde week (optie A), of je ontvangt €30 in de eerste week, €20 in de tweede week en €10 in de derde week (optie B). Voor welke optie kies je?*

◯Optie A: 1e week €10, 2e week €20, 3e week €30
◯Optie B: 1e week €30, 2e week €20, 3e week €10

Volgende pagina

BELANGRIJK: In de vragen 6 tot en met 10 maak JIJ de keuze voor een FAMILIELID (ouder, grootouder, broer of zus)

6.

Vraag 6

Één van je familieleden (ouder, grootouder, broer of zus) heeft deelgenomen aan een loterij en hiermee een geldbedrag gewonnen. De loterij geeft twee opties om het gewonnen geld te ontvangen. Je familielid kan kiezen uit optie A en optie B. Of hij/zij ontvangt direct €20 (optie A), of ontvang een variabel geldbedrag over één week (optie B). Je familielid vraagt aan jou de keuze voor hem of haar te maken. Voor welke optie kies je? Maak een keuze uit optie A en optie B in elke rij.

ontvang €20 direct	◯ ◯	ontvang €17 over één week
ontvang €20 direct	◯ ◯	ontvang €18 over één week
ontvang €20 direct	◯ ◯	ontvang €19 over één week
ontvang €20 direct	◯ ◯	ontvang €20 over één week
ontvang €20 direct	◯ ◯	ontvang €21 over één week
ontvang €20 direct	◯ ◯	ontvang €22 over één week
ontvang €20 direct	◯ ◯	ontvang €23 over één week
ontvang €20 direct	◯ ◯	ontvang €24 over één week
ontvang €20 direct	◯ ◯	ontvang €25 over één week
ontvang €20 direct	◯ ◯	ontvang €26 over één week
ontvang €20 direct	◯ ◯	ontvang €27 over één week

7.

Vraag 7

Één van je familieleden (ouder, grootouder, broer of zus) heeft deelgenomen aan een loterij en hiermee een geldbedrag gewonnen. De loterij geeft twee opties om het gewonnen geld te ontvangen. Je familielid kan kiezen uit optie A en optie B. Of hij/zij ontvangt €20 over één week (optie A), of ontvang een variabel geldbedrag over twee weken (optie B). Je familielid vraagt aan jou de keuze voor hem of haar te maken. Voor welke optie kies je? Maak een uit tussen optie A en optie B in elke rij.

ontvang €20 over één week	◯ ◯	ontvang €17 over twee weken

ontvang €20 over één week	◯ ◯	ontvang €18 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €19 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €20 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €21 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €22 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €23 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €24 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €25 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €26 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €27 over twee weken

8.

Vraag 8

Één van je familieleden (ouder, grootouder, broer of zus) heeft deelgenomen aan een loterij en hiermee een geldbedrag gewonnen. De loterij geeft twee opties om het gewonnen geld te ontvangen. Je familielid kan kiezen uit optie A en optie B. Of hij/zij ontvangt direct €200 (optie A), of ontvang een variabel geldbedrag over één week (optie B). Je familielid vraagt aan jou de keuze voor hem of haar te maken. Voor welke optie kies je? Maak een keuze uit optie A en optie B in elke rij.

ontvang €200 direct	◯ ◯	ontvang €170 over één week
ontvang €200 direct	◯ ◯	ontvang €180 over één week
ontvang €200 direct	◯ ◯	ontvang €190 over één week
ontvang €200 direct	◯ ◯	ontvang €200 over één week
ontvang €200 direct	◯ ◯	ontvang €210 over één week
ontvang €200 direct	◯ ◯	ontvang €220 over één week
ontvang €200 direct	◯ ◯	ontvang €230 over één week
ontvang €200 direct	◯ ◯	ontvang €240 over één week
ontvang €200 direct	◯ ◯	ontvang €250 over één week
ontvang €200 direct	◯ ◯	ontvang €260 over één week
ontvang €200 direct	◯ ◯	ontvang €270 over één week

9.

Vraag 9

Je broer of zus heeft een jas gezien die hij of zij graag wil kopen. De winkel waar deze jas gekocht kan worden geeft twee opties om ervoor te betalen. Of je betaalt direct €20 (optie A), of je betaalt een variabel bedrag over één week (optie B). Je broer of zus vraagt aan jou de keuze voor hem of haar te maken. Voor welke optie kies je? Maak een keuze uit optie A en optie B in elke rij.

betaal €20 direct	◯ ◯	betaal €17 over één week
betaal €20 direct	◯ ◯	betaal €18 over één week
betaal €20 direct	◯ ◯	betaal €19 over één week
betaal €20 direct	◯ ◯	betaal €20 over één week
betaal €20 direct	◯ ◯	betaal €21 over één week
betaal €20 direct	◯ ◯	betaal €22 over één week
betaal €20 direct	◯ ◯	betaal €23 over één week
betaal €20 direct	◯ ◯	betaal €24 over één week
betaal €20 direct	◯ ◯	betaal €25 over één week
betaal €20 direct	◯ ◯	betaal €26 over één week
betaal €20 direct	◯ ◯	betaal €27 over één week

10.

Vraag 10

Één van je familieleden (ouder, grootouder, broer of zus) heeft deelgenomen aan een loterij en hiermee € 60 gewonnen. De loterij geeft twee opties om het gewonnen geldbedrag te ontvangen. Je familielid kan kiezen uit optie A en optie B. Of hij/zij ontvangt €10 in de eerste week, €20 in de tweede week en €30 in de derde week (optie A), of ontvang €30 in de eerste week, €20 in de tweede week en €10 in de derde week (optie B). Je familielid vraagt aan jou de keuze voor hem of haar te maken. Voor welke optie kies je?*

◯Optie A: 1e week €10, 2e week €20, 3e week €30

◯Optie B: 1e week €30, 2e week €20, 3e week €10

Volgende pagina

BELANGRIJK: In de vragen 11 tot en met 15 maak JIJ de keuze voor een VREEMDE

11.

Vraag 11

Terwijl je op straat loopt word je door een willekeurig persoon aangesproken die je niet kent. Deze persoon heeft deelgenomen aan een loterij en hiermee een geldbedrag gewonnen. De loterij geeft hem twee opties om het gewonnen geld te ontvangen. Hij kan kiezen uit optie A en optie B. Of hij ontvangt direct €20 (optie A), of hij ontvangt een variabel geldbedrag over één week. De persoon, die je dus niet kent, vraagt aan jou de keuze voor hem te maken. Voor welke optie kies je? Maak een keuze uit optie A en optie B in elke rij.

ontvang €20 direct	◯ ◯	ontvang €17 over één week
ontvang €20 direct	◯ ◯	ontvang €18 over één week
ontvang €20 direct	◯ ◯	ontvang €19 over één week
ontvang €20 direct	◯ ◯	ontvang €20 over één week
ontvang €20 direct	◯ ◯	ontvang €21 over één week
ontvang €20 direct	◯ ◯	ontvang €22 over één week
ontvang €20 direct	◯ ◯	ontvang €23 over één week
ontvang €20 direct	◯ ◯	ontvang €24 over één week
ontvang €20 direct	◯ ◯	ontvang €25 over één week

ontvang €20 direct	◯ ◯	ontvang €26 over één week
ontvang €20 direct	◯ ◯	ontvang €27 over één week

12.

Vraag 12

Terwijl je op straat loopt word je door een willekeurig persoon aangesproken die je niet kent. Deze persoon heeft deelgenomen aan een loterij en hiermee een geldbedrag gewonnen. De loterij geeft hem twee opties om het gewonnen geld te ontvangen. Hij kan kiezen uit optie A en optie B. Of hij ontvangt €20 over één week (optie A), of hij ontvangt een variabel geldbedrag over twee weken. De persoon, die je dus niet kent, vraagt aan jou de keuze voor hem te maken. Voor welke optie kies je? Maak een keuze uit optie A en optie B in elke rij.

ontvang €20 over één week	◯ ◯	ontvang €17 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €18 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €19 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €20 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €21 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €22 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €23 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €24 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €25 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €26 over twee weken
ontvang €20 over één week	◯ ◯	ontvang €27 over twee weken

13.

Vraag 13

Terwijl je op straat loopt word je door een willekeurig persoon aangesproken die je niet kent. Deze persoon heeft deelgenomen aan een loterij en hiermee een geldbedrag gewonnen. De loterij geeft hem twee opties om het gewonnen geld te ontvangen. Hij kan kiezen uit optie A en optie B. Of hij ontvangt

direct €200 (optie A), of hij ontvangt een variabel geldbedrag over één week. De persoon, die je dus niet kent, vraagt aan jou de keuze voor hem te maken. Voor welke optie kies je? Maak een keuze uit optie A en optie B in elke rij.

ontvang €200 direct	◯ ◯	ontvang €170 over één week
ontvang €200 direct	◯ ◯	ontvang €180 over één week
ontvang €200 direct	◯ ◯	ontvang €190 over één week
ontvang €200 direct	◯ ◯	ontvang €200 over één week
ontvang €200 direct	◯ ◯	ontvang €210 over één week
ontvang €200 direct	◯ ◯	ontvang €220 over één week
ontvang €200 direct	◯ ◯	ontvang €230 over één week
ontvang €200 direct	◯ ◯	ontvang €240 over één week
ontvang €200 direct	◯ ◯	ontvang €250 over één week
ontvang €200 direct	◯ ◯	ontvang €260 over één week
ontvang €200 direct	◯ ◯	ontvang €270 over één week

14.

Vraag 14

Terwijl je door een winkelcentrum loopt, word je door een willekeurig persoon aangesproken die je niet kent. Deze persoon wil graag een jas kopen. De winkel waar de jas gekocht kan worden geeft hem twee opties om ervoor te betalen. Of hij betaalt direct €20 (optie A), of hij betaalt een variabel bedrag over één week (optie B). De persoon die de jas wil kopen, en die je dus niet kent, vraagt aan jou om de keuze voor hem te maken. Voor welke optie kies je? Maak een keuze uit optie A en optie B in elke rij.

betaal €20 direct	◯ ◯	betaal €17 over één week
betaal €20 direct	◯ ◯	betaal €18 over één week
betaal €20 direct	◯ ◯	betaal €19 over één week
betaal €20 direct	◯ ◯	betaal €20 over één week
betaal €20 direct	◯ ◯	betaal €21 over één week
betaal €20 direct	◯ ◯	betaal €22 over één week
betaal €20 direct	◯ ◯	betaal €23 over één week

betaal €20 direct	◯ ◯	betaal €24 over één week
betaal €20 direct	◯ ◯	betaal €25 over één week
betaal €20 direct	◯ ◯	betaal €26 over één week
betaal €20 direct	◯ ◯	betaal €27 over één week

15.

Vraag 15

Terwijl je op straat loopt word je door een willekeurig persoon aangesproken die je niet kent. Deze persoon heeft deelgenomen aan een loterij en hiermee € 60 gewonnen. De loterij geeft hem twee opties om het gewonnen geld te ontvangen. Hij kan kiezen uit optie A en optie B. Of hij ontvangt €10 in de eerste week, €20 in de tweede week en €30 in de derde week (optie A), of hij ontvangt €30 in de eerste week, €20 in de tweede week en €10 in de derde week (optie B). De persoon, die je dus niet kent, vraagt aan jou de keuze voor hem te maken. Voor welke optie kies je?*

◯Optie A: 1e week €10, 2e week €20, 3e week €30
◯Optie B: 1e week €30, 2e week €20, 3e week €10

Volgende pagina

16.

Vraag 16

Wat is je geslacht?*

◯man
◯vrouw

17.

Vraag 17

Wat is je leeftijd?*

18.

Vraag 18

Wat doe je in het dagelijks leven? Als je werkt, omschrijf je vakgebied. Als je studeert, omschrijf je studierichting.*

- ◯werken
- ◯studeren
- ◯werkloos

Versturen

Dit is het einde van de vragenlijst. Bedankt voor je deelname.