Experimental Design of iLEE3

December 19, 2011

Abstract

This document describes the design of iLEE3, the third wave in the iLEE project. The iLEE project is hosted at the University of Copenhagen, funded by the Carlsberg Foundation and directed by Jean-Robert Tyran. The wave consisted of several modules and was carried out over the internet in July-September 2010. Participants were recruited from all subjects who completed iLEE1. The research project was executed by Jean-Robert Tyran, Eva Gregersen, Thomas Stephens and Erik Wengström. Nikos Korfiatis was responsible for the coding of the web interface used for the experiment. Scientific collaborators responsible for the design of the respective modules were Ola Andersson (then Stockholm SE), Dirk Engelmann (then University of London), Morten Hedegaard (then U Copenhagen), Håkan Holm (Lund), Rudolf Kerschbamer (U Innsbruck), Rebecca Morton (NYU), Rupert Sausgruber (U Innsbruck), and Thomas Stephens (then U Copenhagen).

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1 Introduction

This document describes the design of iLEE3 which was carried out over the internet with approx. 1,000 participants from the adult Danish population. iLEE3 has two parts. In Part 1, participants make decisions (data collection part, 12 July to 19 September 2010). In Part 2, participants get feedback and payments (from 17 December 2010 on).

Part 1 consists of 9 independent modules, and participants are paid according to their choices in most of these. The average participant takes about one hour to complete, and earns approx. 40 Euros.

Pretest

Three pretests were run prior to the launch of iLEE3 (December 2009, April 2010, and May 2010). They mainly served to test technical aspects (such as treatment allocation) of the waves, and to calibrate payoffs and completion times. For each pretest hundreds of subjects from the 2005 Politiken database were invited to participate. The number of subjects to complete the pretests was 107, 67 and 97, respectively.

2 Recruitment of subjects

2.1 Overview

We invited 2,244 panelists for iLEE3. All of these had completed iLEE1 in 2008 and more than half of these had also completed iLEE2 in 2009.

Review of recruiting in previous waves:

iLEE1: In May 2008 we carried out iLEE1, the first wave of the panel. Statistics Denmark randomly selected 22,027 Danes of age 18-80. Of these, 2,291 completed iLEE1. Note that the participation rate in iLEE1 is low because we blocked login when a sufficient number of participants had logged in.

iLEE2: All completers of iLEE1 remaining in the DS database (meaning they were still alive and living in Denmark) approximately one year later (2,263) were invited for iLEE2 (May-July 2009) and 1,395 of these completed iLEE2. Thus, all subjects completing iLEE2 have also completed iLEE1.

iLEE3: All completers of iLEE1 remaining in the DS database approximately two years later (2,244 subjects) were invited for iLEE3 (July 14-September 19, 2010). Of these 1,046 subjects completed iLEE3. 873 of 1,047 iLEE3-completers had completed both iLEE1 and iLEE2, while 174 had only completed iLEE1. In summary the numbers of completers are:

iLEE1 2,291

iLEE2 1,395

iLEE3 1,046

Out of the 2,244 subjects invited, 1,661 subjects logged into iLEE3 (the response rate is 74%). All invited subjects received the same invitation letter (see Appendix A).

Table 1: Invitations, logins, and completions across treatments

N	Completed iLEE1	Completed iLEE1 and iLEE2	Total
Invitations	370	1874	2,244
Logins	259	1402	1,661
Completions	131	915	1,046

The subjects are anonymous to us. Statistics Denmark assigned unique subject ID numbers to the randomly selected sample invited for iLEE1. Only Statistics Denmark knows the key of how ID numbers relate to persons (e.g. their CPR numbers). Statistics Denmark used the same ID number for a given person when sending out invitation letters. Thus, a particular person has had the same ID number across waves, and we can therefore track an individual's behavior across waves.

Two reminder letters were sent out during iLEE3 (see Appendix). The first was sent on August 19 to 1,487 subjects, and the second was sent on September 7 to 962 subjects who had not logged in by that time.

2.2 Sample representativeness

The report on sample representativeness below is based on the subjects' self-reported characteristics. We plan to evaluate representativeness using the matched data from DS in greater detail at a later point. The report below refers to the 1046 completers.

Figure 1: Distribution of participants in iLEE3 by Age

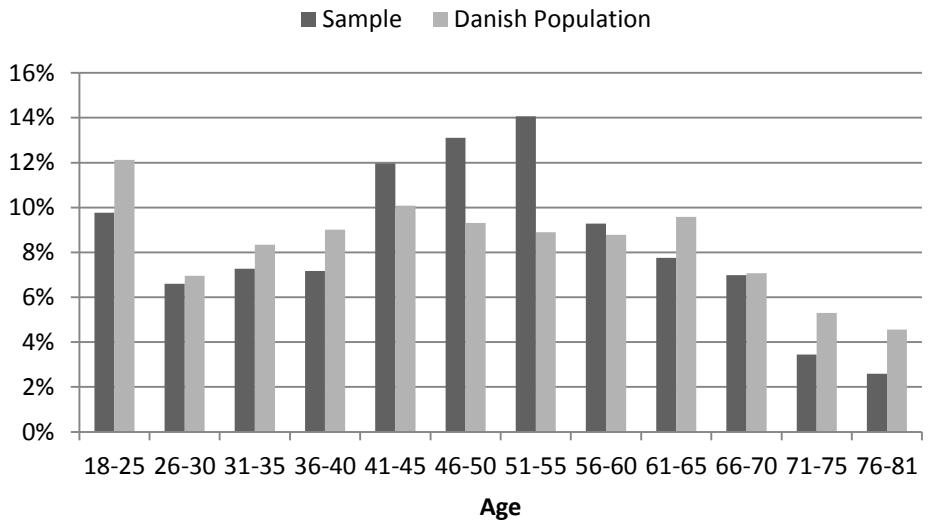


Figure 2: Distribution of participants in iLEE3 by Gender

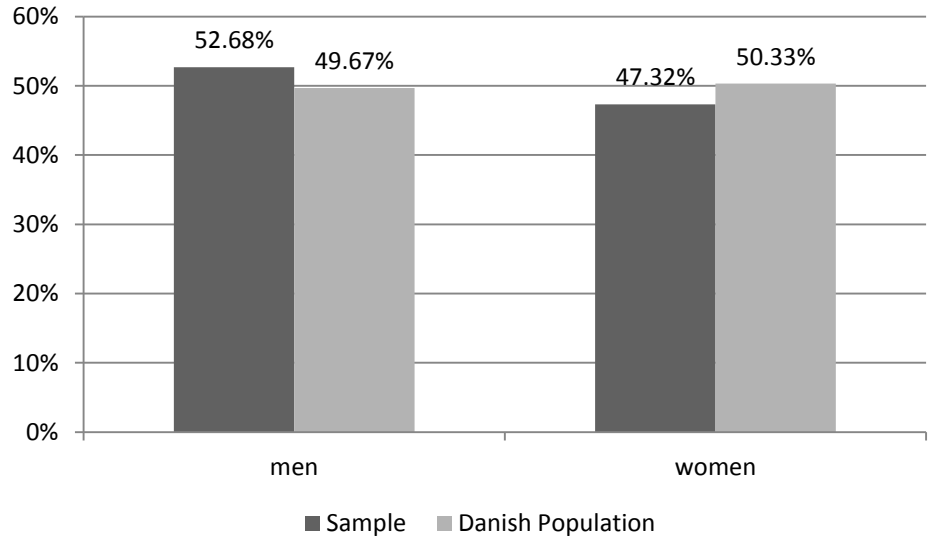


Figure 1 shows the distribution of participants by age, which is significantly different from the distribution in the Danish population (Chi-square test, $p < 0.001$). Broadly speaking, the young (ages 18-40) and the old (above 60) tend to be underrepresented and the middle-aged (40-60) tend to be overrepresented.

Figure 2 shows the gender distribution in iLEE3. Men are slightly overrepresented in the sample (Chi-square test, $p = 0.053$).

3 Data

Following the procedure in previous waves, the data of iLEE3 was sent to Statistics Denmark (SD). SD used the subject ID numbers to match experimental data with a battery of register data. The data is stored in an anonymous format at a server at Statistics Denmark. Data analysis on the matched data can only be performed on the servers of SD. Only the data analysis (e.g. regression results) but not the actual data can be downloaded by researchers. Access to the matched data is subject to rigorous regulations by the Danish authorities and requires permission and contractual agreements with SD and the Department of Economics, University of Copenhagen.

4 Experimental design

4.1 Overview

Part 1 of iLEE3 has 9 "modules" (i.e. elements in which we collect data). Six of these modules are incentivized (i.e. participants earn money according to their choices), two are questionnaire modules, and the experiment ends with complementary information. Figure 3 provides an overview.

General structure of modules: All main modules start with a screen alerting subjects that they now enter a new module. Typically, the start screen is followed by some instructions explaining the task or the rules of interaction, often including numerical examples and graphic illustrations. The trust game (module 1) has control questions that had to be answered correctly to be able to move on, the others do not. All modules end with a screen alerting them that the module is now over.

Figure 3: Sequence of modules in iLEE3

0. Introduction
    (a) Login
    (b) Welcome and basic information screen
    (c) Preliminary background questions
1. Trust game
    (a) General instructions for one-shot game
    (b) Decision screens (two decisions)
    (c) General instructions for 40-period game
    (d) Control questions
    (e) Decision making as first-mover (two decisions)

(f) Revise and confirm
(g) Decision making as second-mover (40 decisions)

2. Measuring distributional preferences
   (a) Instructions
   (b) Choose between two distributions (14 decisions)
   (c) Revise and confirm
3. Selection and work incentives
   (a) Instructions
   (b) Beliefs (relative)
   (c) Decision regarding the wage scheme
   (d) Beliefs (absolute)
   (e) Effective wage scheme is randomly selected and revealed
   (f) Real effort task (15 minutes)
   (g) Feedback
4. Voting with costly participation
   (a) Instructions and assignment of roles
   (b) Decision screens (three decisions)
5. Social risk
   (a) Instructions
   (b) Decision screens (four screens with 10 decisions per screen)
6. Elicitation of beliefs in dictator games in iLEE2
   (a) Instructions (recap of iLEE2 module)
   (b) Decision screens (two decisions)
7. Housing questions
   (a) Instructions
   (b) Evaluate advantageousness of 16 transactions (non-incentivized)
8. Other questions
   (a) Family situation when child
   (b) Religion
   (c) Janteloven
   (d) Control of participation in earlier iLEE waves
9. End of Part 1
   (a) Bank info and email request
   (b) Additional comments

Randomization of modules: The order in which subjects completed modules 2-5 (measuring distributional preferences, selection and work incentives, voting and social risk) was randomized.

Assignment of subjects to treatments: In several of the modules, subjects were assigned to treatments (see below). The introduction module (0) was identical for all participants with one exception.[1]

Attrition by module: Table 2 shows attrition by module. By far the majority of the attrition occurred in the first and longest module (the trust game) and which featured control questions that had to be completed to proceed with the experiment. Of the 618 subjects who logged in but did not complete iLEE3, 80% dropped out in the trust game. Attrition in other modules is minimal.

Table 2: Attrition in iLEE3

N	**Completions**	**Attrition**
Introduction	1526	34
Module 1	1085	441
Module 2	1076	9
Module 3-6	1049	27
Module 7-8	1046	3
Total	1046	514

[1] Subjects who had been allocated to the treatment condition Hypothetical in iLEE1 (i.e. invitation letter does not mention payment and subjects were in fact not paid) were informed that they would in fact be paid for real in iLEE3.

5 Detailed description of modules

General structure of screens: All screens described below have the same basic layout and structure. The bottom band informs that the Department of Economics at the University of Copenhagen hosts the experiment and features a "logout" button. Participants can log out at their discretion and come back any time while Part 1 is open (approximately two months). Upon login, they are routed back to the module they left. The top band features a "help" option informing about the closing date of the wave and our contact details. An "Instructions" option on all decision screens allows subjects to review instructions for the current module. Decision buttons are placed in the lower right corner of the screen. Screenshots for specific screens are available on request.

Module 0: Introduction

This module is identical to module 0 in all previous waves of the panel.

(a) Login screen: At the URL (*http://ilee.econ.ku.dk*) mentioned in the invitation letter, subjects log in by typing their personal ID number indicated in the letter.

(b) Welcome screen: informs that participation in the experiment is valuable to research and reminds that it is important that the person participating in the experiment is the person named in the invitation letter; cautions that the experiment has to be completed to be entitled to any payment. Informs that expected time for completion is approximately 1 hour, and that they may log out during the experiment and return at a later point in time until the end of the experiment. Subjects are reassured that they remain anonymous to us and to other participants. The subjects have all completed at least one previous wave of iLEE and are therefore familiar with the procedure.

(c) Preliminary background questions: asks about the subject's age, gender and highest completed level of education. These questions are placed at the beginning of the wave when minimal attrition has taken place such that we can later validate the identities of as many subjects as possible. Validation is done by comparing a subject's self-reported demographic data with the register data from Statistics Denmark for the individual to whom the invitation letter was addressed. We thus obtain a proxy control against the participating subject being the wrong individual.

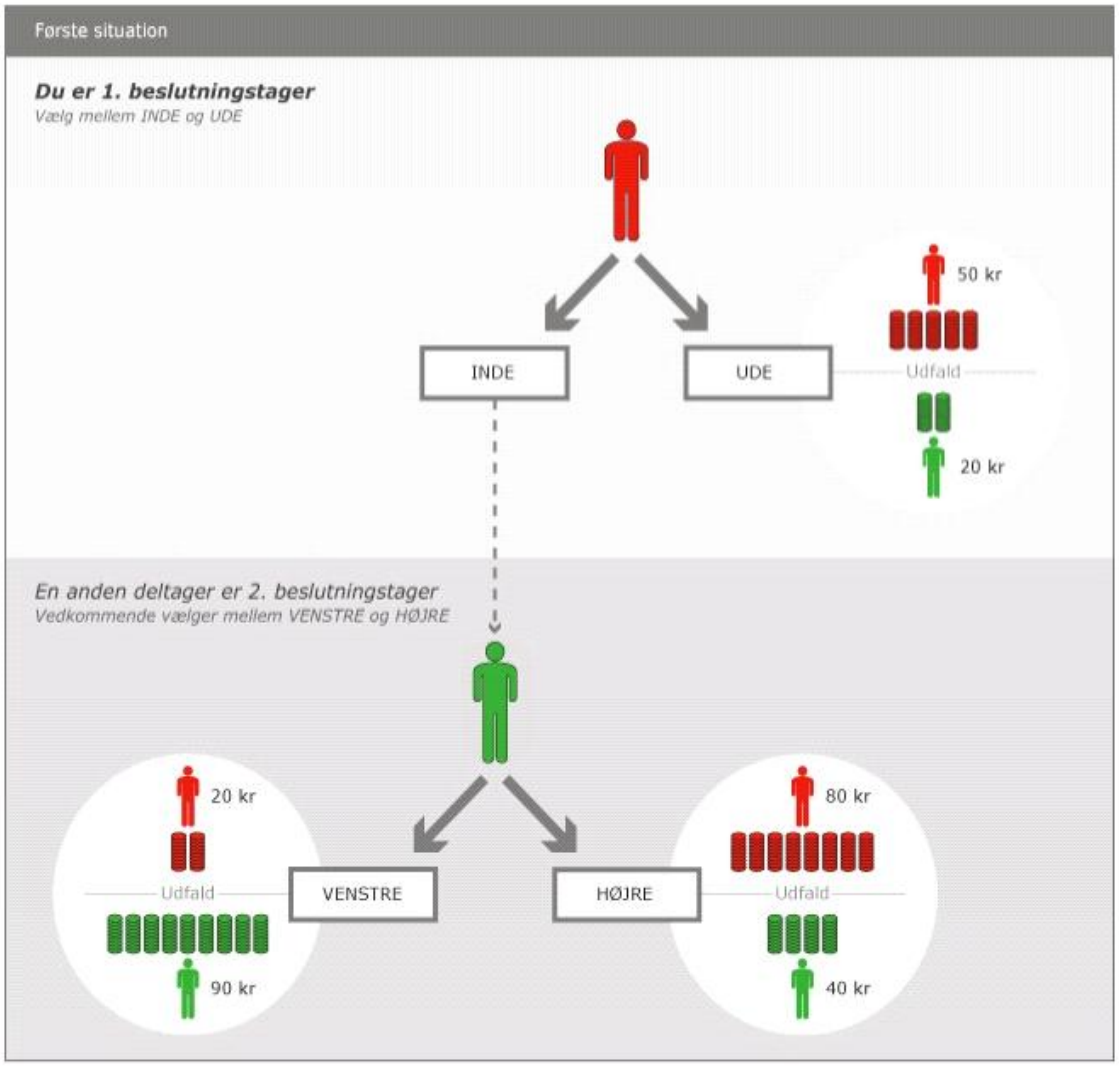
Module 1: The trust game

The module has been designed by Dirk Engelmann and Jean-Robert Tyran, in collaboration with Eva Gregersen. The graphics have been produced by graphical designer Marie Krause (marysometimes@gmail.com, (+45) 30 28 99 09).

In short, subjects played **two variants** of the trust game: A **one-shot trust game** and a **repeated trust game**.

In the **one-shot trust game** subjects make choices both as a first- and as a second-mover with different subjects and are paid in one match. The first mover chooses *in* ("trust") or *out*, the second mover chooses *left* or *right* ("honor trust"); Figure 4 shows the game tree and the payoffs in DKK.

Figure 4: Illustration of game tree (header and footer cut for better readability)



In the **repeated trust game**, participants play the stage game above for 40 periods. In essence, first movers choose a strategy conditional on the "standing" of the second mover (2 choices) throughout the 40 periods in the beginning (explained in more detail below). As a second mover, they make the choice *left* or *right* 40 times, once for each period. Second movers are matched with a subject that has previously chosen a strategy as the first mover. The payoffs are the same as in the one-shot game for each period. The history (or reputation) of the second-mover is summarized in a "status" (*blue* or *yellow*) as shown in Figure 5. Essentially, the status is *blue* if the second-mover has not chosen *left* in *h* previous interactions. Note that the status is *blue* either because the second mover has not had the chance to make a choice in the previous *h* periods or because he always honored trust (chose *right)*. However, the status can only be *yellow* if the second mover chose *left* at least once in the previous *h* periods. The treatments differ by the length of the "history", i.e. *h* is 1, 3 or 7, and *h* is common information to all participants in a treatment; participants are assigned randomly to one of the three treatments.

Figure 5: Illustration of repeated game (footer cut)

We used first-mover strategies from the respective treatment in the pretest to be matched with the first 23 second movers reaching the repeated game of module 1.[2]

Table 3: Earnings in module 1

	#Obs.	**Average earnings**
One-shot game	1046	43.4
Repeated game (*h* = 1)	334	45.2
Repeated game (*h* = 3)	363	45.1
Repeated game (*h* = 7)	349	43.7

The order of screens is as follows:

(a) **Instructions for one-shot game:** Subjects are told that they will have to make two decisions. They learn that they are matched with a different person in each situation and that only one of the situations will be paid at the end of the experiment (to both subjects of the match). The next screen explains the "first situation" to subjects.

(b) **Decision screens:** There are two decision screens. **Decision1:** Explains that the subject is now in the role as first mover. The screen explains the game. The first mover chooses *in* or *out*, the second mover *left* or *right*. The payoffs are explained both in a table and graphically. The screen ends with the decision *in* or *out*. **Decision2:** Explains that the subject is now in the role of the second mover. The screen repeats options and payoffs both in a table and graphically. The screen ends with the second-mover choice. After that, a screen appears saying "the first part is now over" and that the results will be revealed when the entire experiment is over.

(c) **Instructions for repeated game:** Explain that each participant makes two choices as first mover and 40 choices as second mover. The first-mover choices are contingent on the history (summarized in a "status") and are made according to the strategy method. First-mover choices are not contingent on the period of the game. The following summarizes screen-by-screen how instructions and examples were presented. **Instructions1:** Explains that the subject will "be involved in" 40 situations as first mover and 40 situations as second

[2] The trust rate was not different in the pretest compared to the main experiment for status *yellow* (39% vs. 35%, p = 0.344, WRS) but was higher if *blue* (69% vs. 56%, p = 0.008, WRS).

mover. In each situation, the subject is matched with a different participant. The possible outcomes (payoffs) are as before. **Instructions2:** Explains that the subject is first in the role as first mover and that, in contrast to the one-shot game, the subject learns the "status" of the second mover (which can be *blue* or *yellow*). The screen also explains that while the subject is "involved" in 40 situations, he or she has only two choices to make, i.e. to choose *in* or *out* for either status. **Instructions3:** Explains the choices of the second mover. Explains that second-mover status is *blue* in the first period and remains *blue* unless the second mover chooses *left* in which case it turns *yellow*. In this case, the status remains *yellow* for *h* periods unless the second mover chooses *left* again. The information participants are given on this screen depends on the treatment. Treatments have history length 1, 3 or 7. Participants are randomly assigned to treatments. **Instructions4:** Provides 4 examples, illustrating what the screen for the second mover looks like, and how the status depends on choices made. **Instructions5:** Explains that subjects are only paid either as first mover or as second mover (equally likely). They are told that only one randomly chosen period is paid and both subjects who are matched in this period are paid.

(d) **Control questions:** Subjects have to answer six questions regarding the number of periods and choices as first mover and as second mover, the matching procedure, and the task.

(e) **Decision making as first-mover:** Two screens. **Decision1:** summarizes the game (in a table). Task: Given that the status of second mover is *blue*, choose *in* or *out*, choice is binding for all 40 periods. **Decision2:** summarizes the game (in a table). Task: Given that the status of second mover is *yellow*, choose *in* or *out*, choice is binding for all 40 periods.

(f) **Revise and confirm:** Provides summary information and shows decisions made on the previous two screens with the option to revise or confirm first-mover choices. The next screen informs that the subject will now be second mover for 40 periods.

(g) **Decision making as second mover:** Decision screens have two parts. Upper part: shows whether the match (i.e. the first mover) has chosen *in* or *out*, summarizes payoffs for both possible outcomes and displays the choice buttons; Lower part: is continuously updated as the game unfolds. Provides a summary of the history (period, status, choices, payoffs). See an example of the second-mover decision task in Figure 6.

***Figure 6*:** Decision screen for a second-mover in the repeated game (period 15, h = 3, second-mover has *yellow* status in period 15, header and footer cut for better readability)

Dine beslutninger som anden beslutningstager

Situation	Din status er	Første beslutnings-tagers valg	Din beslutning	
15 ud af 40	Gul	INDE	Du vil få 90 kr. Den anden vil få 20 kr. Din status vil forblive gul i de næste 3 situationer.	Du vil få 40 kr. Den anden vil få 80 kr. Din status vil blive blå.
			Vælg VENSTRE	Vælg HØJRE

Historik

Situation	Din status var	Første beslutnings-tagers valg	Du valgte	Din status	Hvis situationen udvælges til betaling	
					Du får	Første beslutningstager får
14	Gul	UDE		Forblev gul	20 kr.	50 kr.
13	Gul	UDE		Forblev gul	20 kr.	50 kr.
12	Blå	INDE	VENSTRE	Blev gul	90 kr.	20 kr.
11	Blå	UDE		Forblev blå	20 kr.	50 kr.
10	Blå	INDE	HØJRE	Forblev blå	40 kr.	80 kr.
9	Blå	INDE	HØJRE	Forblev blå	40 kr.	80 kr.
8	Blå	UDE		Forblev blå	20 kr.	50 kr.
7	Blå	UDE		Forblev blå	20 kr.	50 kr.
6	Blå	UDE		Forblev blå	20 kr.	50 kr.
5	Blå	INDE	HØJRE	Forblev blå	40 kr.	80 kr.
4	Blå	INDE	HØJRE	Forblev blå	40 kr.	80 kr.
3	Blå	UDE		Forblev blå	20 kr.	50 kr.
2	Blå	INDE	HØJRE	Forblev blå	40 kr.	80 kr.
1	Blå	UDE		Forblev blå	20 kr.	50 kr.

Module 2: Measuring distributional preferences

This module was designed by Morten Hedegaard, Rudolf Kerschbamer and Jean-Robert Tyran. The module implements a version of the "XY-test" of distributional preferences developed by R. Kerschbamer.

In essence, participants make a series of 14 choices allocating money between themselves (as "decision makers") and one other participant (the "recipient"). The "left" choice varies the distribution between "self" and "other" while the "right" choice is the equal split (each gets DKK 50). The "X" part consists of seven choices in which "other" gets more (DKK 75) than "self" (between DKK 20 and DKK 58). The "Y" part also consists of seven choices where "other" gets less (DKK 25) than "self" (between DKK 42 and DKK 80). The 14 choices are presented on separate screens in random order and the subject has the option to review and revise or confirm the choices.

Treatment variations concern a) the information about the allocation of roles when making the choices and b) the presentation of the X- and Y-lists.

a) There are **two primary treatments** that relate to the roles and possible interaction of decision makers and recipients: **FixedRoles** and **RandomRoles**. In treatment FixedRoles, half of the participants are decision makers and the other half are recipients. Roles are assigned randomly and are revealed after both participants have read the instructions and before choices are made. Recipients make no decisions and are redirected to the next module. In treatment RandomRoles, all participants make choices as if they were decision makers. A random draw ex post determines which role each participant is paid for. Subjects chosen to be decision makers are randomly matched with those chosen to be recipients. Instructions are kept as similar as possible across treatments. Treatment allocation is random with 1/3 of participants in treatment FixedRoles and 2/3 of participants in RandomRoles. Table 4 shows the treatment allocation.

Table 4: Treatment allocation

	FixedRoles	RandomRoles	Total
Decision maker	176	347	523
Recipient	176	347	523
Total	352	694	1046

b) There are four secondary treatments in a 2x2 design relating to the presentation of the X- and Y-lists on the confirmation screen (only shown to subjects who make decisions). The first dimension is whether the X- or the Y-list is shown first and the second dimension is the ordering (ascending or descending) within lists. Allocation to treatments is random and treatments are equally likely.
Only one choice is paid. This choice is determined by a random draw ex post. The average earnings are DKK 51.8. The average earnings in the FixedRoles treatment are DKK 51.7 and DKK 51.9 in the RandomRoles treatment.

The order of screens is as follows.

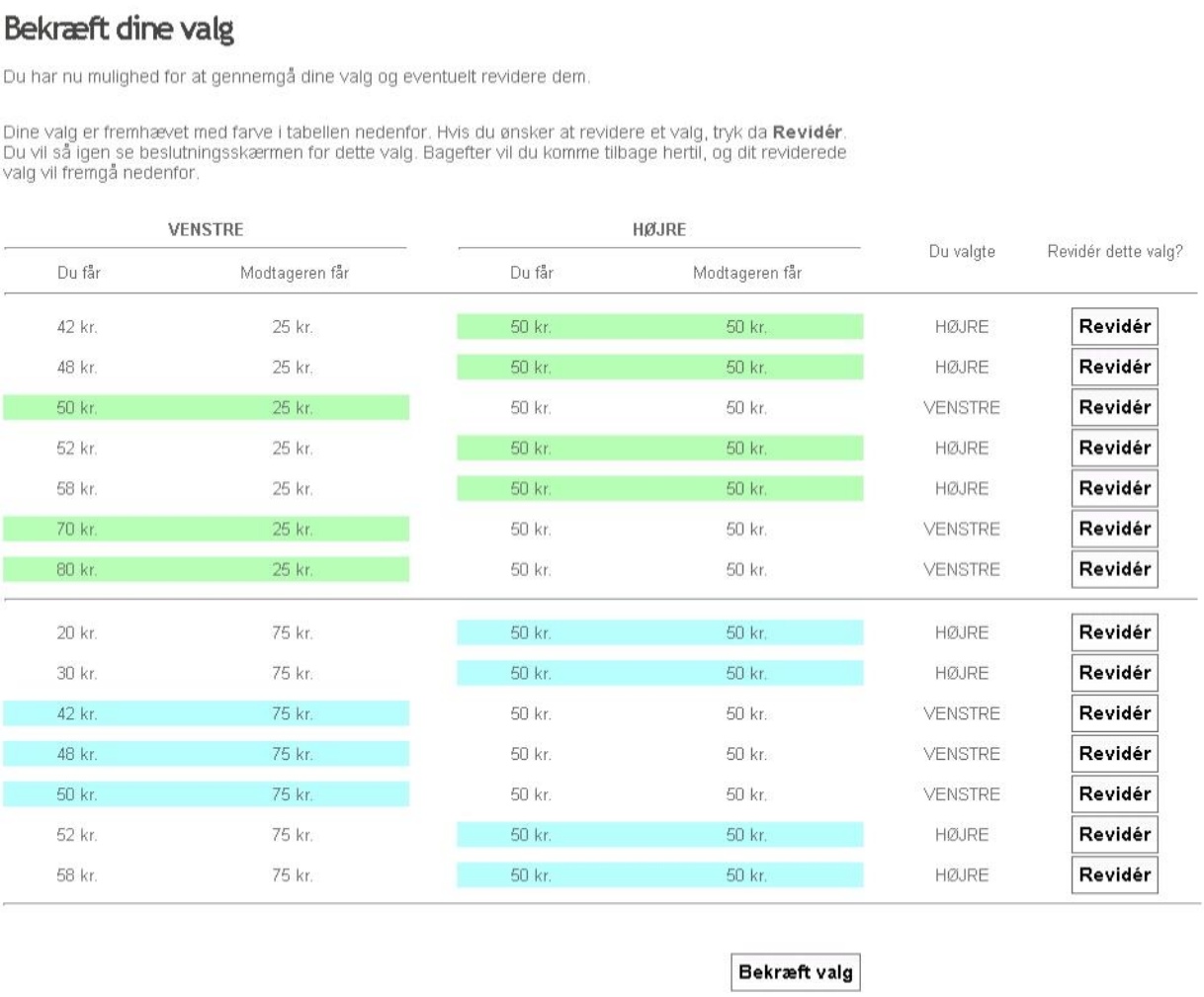
(a) Instructions: Two screens. **Instructions1**: Subjects are informed about the two roles: Decision makers and recipients. Subjects are randomly paired. The decision maker makes 14 decisions about the distribution of a sum of money (*left* or *right*). One decision is paid out. The recipient does not make any decisions (in FixedRoles). An example is shown and payments are calculated. **Instructions2**: The subject learns if he is a decision maker or a recipient. Recipients are redirected to the next module (in FixedRoles). Decision makers continue to decision screens. (RandomRoles is the same except that participants learn that they make choices as if they were decision makers. They know that a random draw ex post determines according to which role each participant is paid).

(b) Decision screens: Fourteen screens on which the distribution and the total amount of money varies in the left option (see Figure 7). The right option is always the DKK 50-50 split.

(c) Revise and confirm: After the 14th decision, the subject sees all the 14 choice situations and his decisions. He can change any decision by pressing the "revise" button next to the decision and eventually confirm (see Figure 8).

Figure 7: Sample decision screen (header and footer cut for better readability)

Figure 8: Review and Confirmation of choices in Module 2



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Dine valg er fremhævet med farve i tabellen nedenfor. Hvis du ønsker at revidere et valg, tryk da **Revidér**. Du vil så igen se beslutningsskærmen for dette valg. Bagefter vil du komme tilbage hertil, og dit reviderede valg vil fremgå nedenfor.

VENSTRE		HØJRE		Du valgte	Revidér dette valg?
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48 kr.	25 kr.	50 kr.	50 kr.	HØJRE	Revidér
50 kr.	25 kr.	50 kr.	50 kr.	VENSTRE	Revidér
52 kr.	25 kr.	50 kr.	50 kr.	HØJRE	Revidér
58 kr.	25 kr.	50 kr.	50 kr.	HØJRE	Revidér
70 kr.	25 kr.	50 kr.	50 kr.	VENSTRE	Revidér
80 kr.	25 kr.	50 kr.	50 kr.	VENSTRE	Revidér
20 kr.	75 kr.	50 kr.	50 kr.	HØJRE	Revidér
30 kr.	75 kr.	50 kr.	50 kr.	HØJRE	Revidér
42 kr.	75 kr.	50 kr.	50 kr.	VENSTRE	Revidér
48 kr.	75 kr.	50 kr.	50 kr.	VENSTRE	Revidér
50 kr.	75 kr.	50 kr.	50 kr.	VENSTRE	Revidér
52 kr.	75 kr.	50 kr.	50 kr.	HØJRE	Revidér
58 kr.	75 kr.	50 kr.	50 kr.	HØJRE	Revidér

Bekræft valg

Module 3: Selection and work incentives

The module was designed by Rupert Sausgruber and Jean-Robert Tyran.

In essence, participants choose between incentive schemes which determine the payoffs for their performance in a work task. Before they choose the scheme, they are asked about their expectations on how they are going to perform (absolute performance) and how others are going to perform (relative performance) under the respective schemes. They can then work for up to 15 minutes on a real effort task (counting yellow squares) and earn money. The difficulty of the task is increasing over time (see Figure 10), and the work task screens are the same for all participants.

There are two types of **treatments**: a) the payoff a subject gets only depends on his or her own choices (scheme and effort), b) the payoff of a subject depends on the choices of one other subject (there is a payoff externality). There are 7 treatments in total. Incentives are either "steep" (no fixed wage, piece rate of DKK 1.5 per correct answer) or "flat" (fixed payment of DKK 60, piece rate of DKK 0.5 per correct answer).

a) Three treatments without externalities. In ENDO, subjects choose between the flat and the steep incentive scheme and get the chosen scheme. In SteepEXO and FlatEXO, subjects indicate which scheme they prefer but are assigned either scheme with a 50% chance.

b) Four treatments with externalities: In PosSteepEXO and PosFlatEXO subjects are matched in pairs and each subject benefits from the other's effort (positive externality). In NegSteepEXO and NegFlatEXO the externality is negative, so each incurs a cost from the other's effort.

Participants were assigned to treatments as follows: Participants who are inexperienced with the task (i.e. did not participate in the experiment with the essentially same task in ILEE2), are randomized into treatment ENDO with 50% probability and to SteepExo/FlatExo with 25% each. Experienced participants are randomized into treatments as follows: ENDO with 30%, SteepExo/FlatExo with 15% each, and to one of the remaining four treatments with 10% each.

Participants are paid according to the wage scheme they are allocated to. In treatments with an externality, the earnings are modified as follows: For each correct answer of their matched "partner", DKK 0.5 is deduced from their earnings in NegX, and added in PosX.

1,067 subjects completed this module. Overall average earnings in the module were DKK 83.0.

Table 5: Average earnings by treatment

Treatment	#Obs	Average Earnings
ENDO	368	91.8
SteepEXO	173	88.2
FlatEXO	174	90.7
PosSteepEXO	91	93.1
PosFlatEXO	86	103.0
NegSteepEXO	96	32.0
NegFlatExo	79	41.2
Total	1067	83.0

The screens were presented in the order shown below.

(a) Instructions: Three screens. **Instructions1:** Explains that participants may work for up to 15 minutes on a work task for money. Those who had participated in iLEE2 saw the message that it is the same task as last year. **Instructions2:** Shows an example of the 10x10 grid (see Figure 9). The task is to count the yellow cells. They are told that they can quit the task any time (but cannot come back to the task. Instead, they will be routed to the next module if they quit before 15´). The time remaining is shown in the upper right corner. **Instructions3:** Explains that there are two "wage schemes". In scheme 1, the participant gets 1.5 kr. per point, in scheme 2, DKK 0.5. per point plus DKK 60 independent of how many points they collect, plus/minus any bonuses because of externalities (if it applies). Two examples illustrate how the wage schemes map a given number of points into money.

(b) Expectations: Split into three screens. **Expectations1:** Indicate relative expectations given that everyone is in wage scheme 1 (which quintile of the output distribution) and then the same for wage scheme 2. **Instructions2:** Explains how participants are allocated to wage schemes. They are told that everyone has to indicate their preferred wage scheme. Half of all subjects get their preferred scheme, the other half is randomly allocated to a flat/steep wage scheme (equally likely). Also indicate which scheme they prefer. **Expectations3:** Asks about absolute expectations, i.e. how many points the subject believes to collect in wage scheme 1 and wage scheme 2.

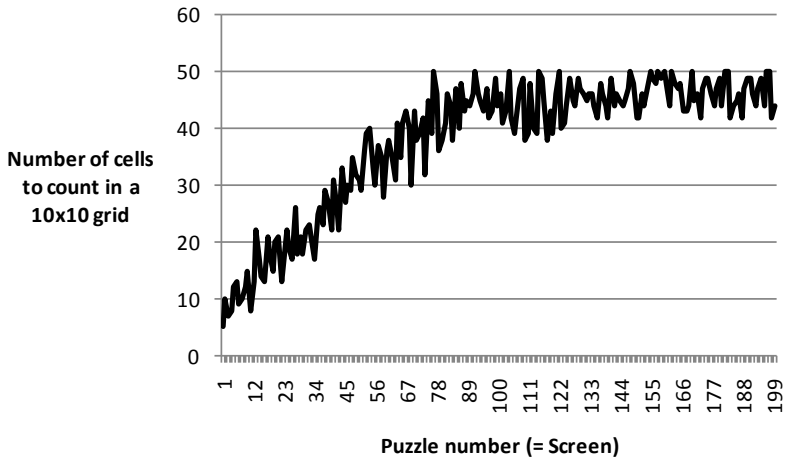
(c) Revelation of wage scheme: Informs them which scheme they got and reminds them of incentives. If the subject presses start, can work for a maximum of 15 minutes.

(d) Real effort task: Count yellow cells in a 10x10 grid. See Figure 9.

(e) Feedback: Indicates how many points they collected and how much money they earned.

Figure 9: Real effort task

Figure 10: Increasing difficulty of grids (reaches max. difficulty after about 80 tasks)



Module 4: Voting with costly participation

This module was designed by Rebecca Morton and Jean-Robert Tyran.

In short, participants are assigned to a group (A or B) and vote on how to distribute money between these groups by voting for Party A, Party B or by abstaining. Half of the subjects are of type A and the other half is of type B. The decision is made by simple majority of votes cast. Voting involves a cost: DKK 0, 1, or 5 (equally likely). If a subject abstains in an election, his voting cost is zero.

Treatments differ by the size of the electorate (600, 60 or 6 subjects). In each treatment, subjects participate in three elections. The first 600 subjects to reach module 4 were assigned to the large electorate of 600. The next 300 subjects were assigned to the electorate of 60. The remaining subjects were allocated to the small electorate of 6.

Table 6 shows payoffs for the three elections. Voting costs, if any, are subtracted from these payoffs.

Table 6: Payoffs in the three elections (in DKK)

	Party A wins	Party B wins	Tie
Type A	15	5	10
Type B	5	15	10

	Party A wins	Party B wins	Tie
Type A	15	5	10
Type B	15	19	17

	Party A wins	Party B wins	Tie
Type A	19	5	12
Type B	15	19	17

Subjects earned DKK 36.9 on average. Table 7 shows the distribution of subjects across treatments.

Table 7: Average earnings

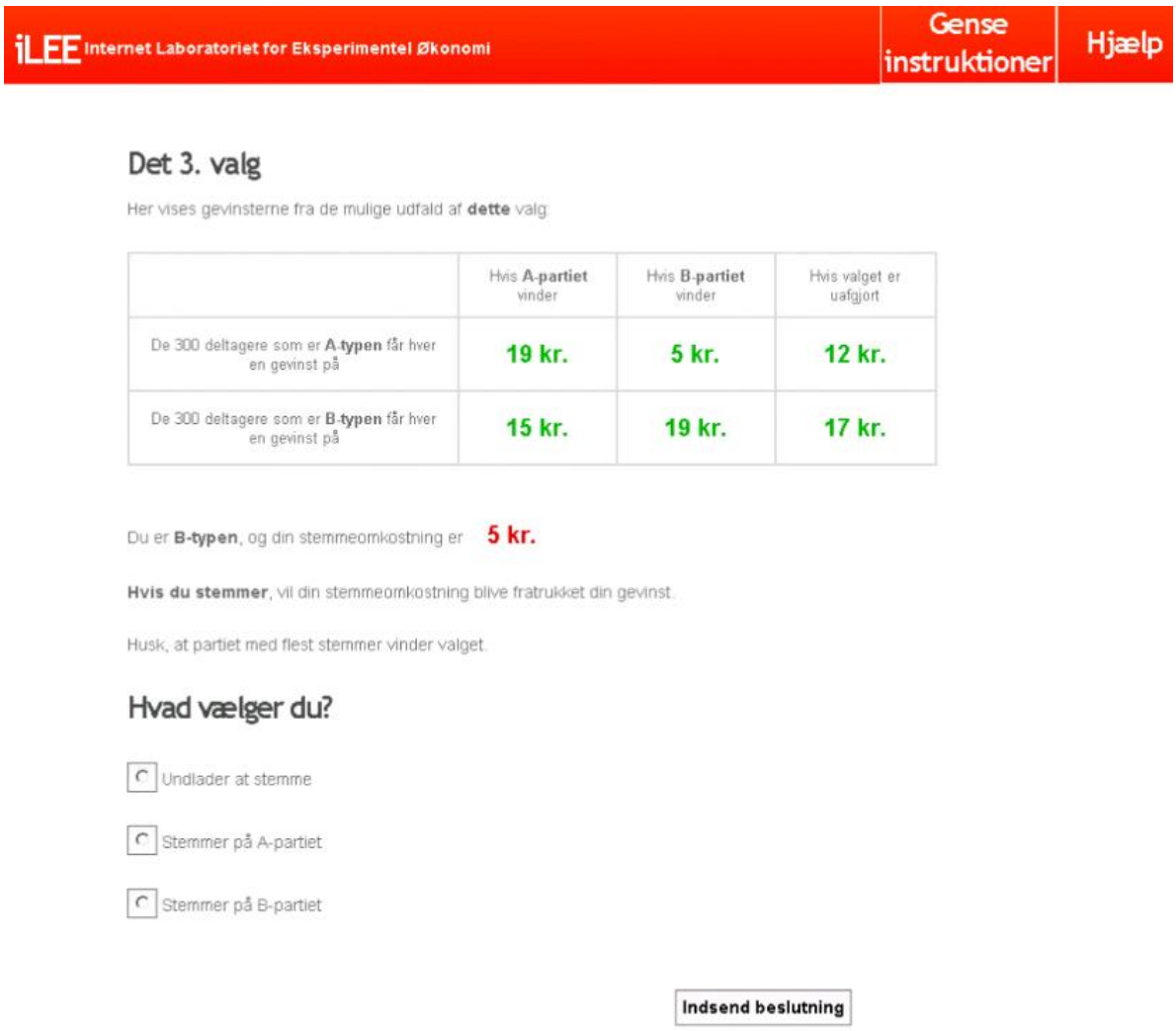
Size of the electorate	**#Obs**	**Avg. Earnings**
600	594	37.5
60	300	37.0
6	152	35.0
Total	1046	36.9

The screens were presented in the order shown below.

(a) Instructions: Two screens. **Instructions1:** Informs the subjects that they will participate in three elections, the size of the electorate, the types and voting costs and how these are distributed among the subjects. **Instructions2:** Shows the payoffs from the first election and reminds the subjects about the size of the electorate and the distribution of types and voting costs. Subject learns own type and voting cost.

(b) Decision screens: Payoffs are shown in a table. The voter can vote for Party A, vote for Party B, or abstain. The "abstain" button is randomly positioned either above or below the buttons for Party A and Party B. Figure 11 shows an example of a decision screen. Three such screens in total.

Figure 11: Decision screen (election 3, type B, voting cost of DKK 5 and electorate of 600 voters)



Module 5: Social risk

This module was designed by Ola Andersson, Håkan Holm, Jean-Robert Tyran and Erik Wengström.

In short, participants repeatedly choose between a pair of lotteries ("left" vs. "right"). Each lottery has two possible outcomes which are equally likely (explained to subjects as a coin toss). Lotteries are presented in tables in which there are 10 choices to make (see Figure 13 for an example). In total, there are 4 tables which were presented in random order. The structure of the tables is such that the "left" option is relatively safe (possible payoffs are similar) and payoffs of the left option do not vary across choices (i.e. within a table). In the "right" option, the low payoff is held constant within a table but the high payoff varies systematically. Participants are paid according to one of the choices. Losses were possible in this module. Losses, if any, were deducted from gains in other modules. Payoffs across modules were calibrated such that it was not possible for subjects to incur losses over the entire iLEE3 wave.

There are four treatments:

Treatment 1: Baseline treatment. The decision maker´s (DM) choice only affects payoff of the DM.
Treatment 2: Hypothetical treatment. DM are asked to make choices as if they were payoff-relevant to themselves, but no payment is actually made.
Treatment 3: DM choice affects DM and one other participant. Half of the participants are "recipients", the other half are DM. The DM make the choices in the four tables, the recipients do not make choices.

Treatment 4: DM choice does not affect DM payoff but does affect the payoff of one other participant. Half the subjects are decision makers, the other half are recipients.

The allocation to the treatments was randomized (see Table 8). Roles are assigned ex ante in treatments 3 and 4, i.e. recipients do not make choices and are directly routed to the next module.

One of the choices in one of the tables was chosen at random to be payoff relevant, and a random draw determined the earnings of the participant(s). Matching occurred within the treatments (four DM had to be matched twice because there were more recipients than decision makers). Average earnings were DKK 45.5 in this module.

Table 8: Average earnings by treatment in module 5

	Probability	NoO	Earnings
Treatment 1	1/6	174	73.2
Treatment 2	1/6	175	n.a.
Treatment 3	1/3	347	64.8
Treatment 4	1/3	350	35.3

The screens were presented in the order shown below.

(a) Instructions: Two screens. **Instructions1:** Informs the subjects that they have to make 10 choices each in four tables. A sample choice is presented, and the payoffs for DM and the recipient are explained. **Instructions2:** Provides the information to whom DM choices are relevant.

(b) Decision screens: Four tables are presented in random order. All 10 choices must be answered by either clicking the left or right button to proceed.

Figure 12: Sample instruction screen (header and footer cut for better readability)

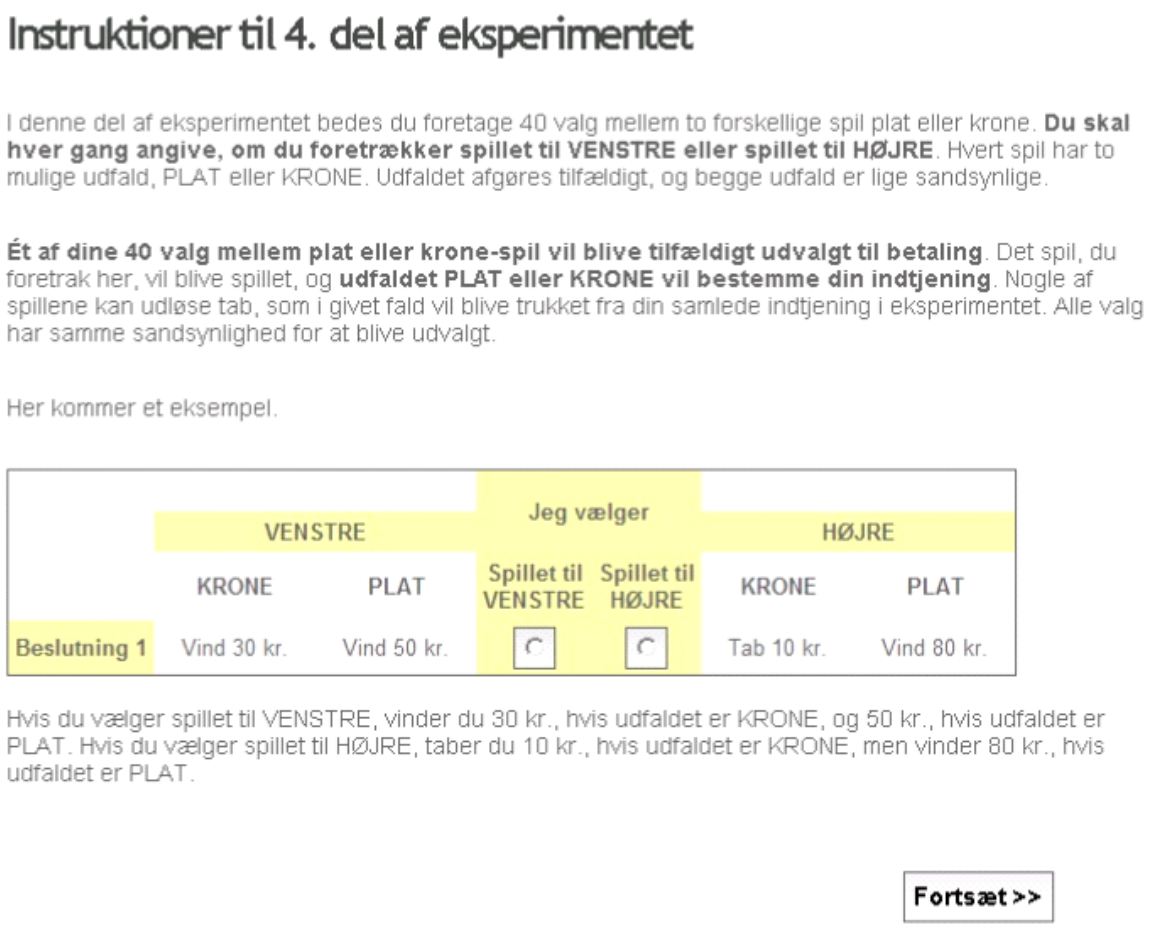


Figure 13: Sample decision screen in module 5 (header and footer cut)

Module 6: Elicitation of beliefs in dictator games in iLEE2

This module was designed by Alexander Cappelen, Bertil Tungodden, Jean-Robert Tyran.

In essence, participants are asked to indicate their beliefs about how other participants made choices in the dictator game in which endowments were provided by the experimenter in module 1 of iLEE2. This module 6 has **two conditions**: iLEE2No and iLEE2Yes. The conditions differ by subjects' experience with the dictator game and the wording on screen. Subjects who had participated in iLEE1 but not iLEE2 (and, thus, not in the dictator game) are assigned to iLEE2No. Subjects who had participated in both iLEE1 and iLEE2 (and therefore also the dictator game) are assigned to iLEE2Yes.

In both conditions, subjects indicate the percentages of subjects (presented as: how many out of 10 randomly drawn other subjects) who did the following: (i) Keep DKK 150 and transfer DKK 0 to the recipient; (ii) Keep DKK 90-135 and transfer DKK 15-60; (iii) Keep DKK 75 and transfer DKK 75; (iv) Keep DKK 15-60 and transfer DKK 90-135; (v) Keep DKK 0 and transfer DKK 150. Subjects are paid up to DKK 10 for indicating correct beliefs ("for each participant you guess correctly you earn DKK 1"). The payments were calculated by comparing the answers to the average rounded true distribution ((i):3 (ii):2 (ii):4 (iv):0 (v):1) from module 1 in iLEE2. For example, suppose a subject indicates to believe that 4 out of 10 chose (i) while in fact the empirical incidence was 3. In this case, the subject earns DKK 3 on this question. For those in iLEE2Yes, we also ask what they chose themselves in iLEE2 (click one of five buttons like i-v) and how sure they are about their decision in iLEE2. They receive DKK 5 for the correct indication of their choice in iLEE2.

Overall, the subjects earned DKK 7.9 in this module (DKK 6.7 in iLEE2No, N = 131, DKK 8.0 in iLEE2Yes, N = 915).

The order of screens is described below.

(a) Instructions: Two screens. **Instructions1:** Reminds the subject of his/her participation in the dictator game (iLEE2No: explains that others participated). Explains that participants are later asked to indicate their beliefs and that correct beliefs are rewarded. **Instructions2:** Explains the dictator game from iLEE2 (each gets DKK 75 from the experimenter, one of them can decide how to allocate the total pie of DKK 150, everyone

makes dictator choice, paid with 50% chance as dictator or recipient). The possible splits are shown in a pie chart and a list.

(b) Decision screens: Two decision screens. **Decision1:** iLEE2Yes (incentivized): "*What did you choose in the earlier experiment*?" iLEE2No (non-incentivized): "*What would you yourself have chosen, had you participated in the experiment*?" Five options (see i-v above). Five choices presented in tabular form with radio buttons. Also, the subjects in iLEE2Yes are asked to indicate how sure they are about their own earlier choice (1 = totally unsure; 10 = totally sure, not incentivized). **Decision2:***"What is your belief about how others have made choices?"* Subjects are asked to indicate how many out of 10 randomly chosen subjects have chosen the five options. Choices are presented in tabular form; participants have to type an integer number from 0 to 10 in each of the five cells.

Module 7: Housing questions

This module was designed by Thomas A. Stephens and Jean-Robert Tyran.

Subjects answered **sixteen housing questions** on two screens: a **real gain screen** and a **real loss screen**. The screens were presented in random order. Each screen contained eight questions, also presented in random order. Subjects were assigned to either a *precise* treatment or a *rule-of-thumb* treatment.

Precise treatment

Figures 15 and 16 respectively show the real gain and real loss screens in the precise treatment.

For each question, a subject was presented with a **scenario** in which a hypothetical individual purchased a house for DKK 2 million, and sold it after an unspecified number of years for another price. Subjects were also told the **percentage change in the price** between the purchase and sale, as well as the **rate of inflation**. Subjects were asked to evaluated the advantageousness of each scenario, on a scale of 1 ('Not at all advantageous') to 15 ('Very advantageous').

The eight questions on each screen were paired, with both questions in each of the **eight pairs** (four pairs per screen) presenting the same **real scenario**. A real scenario is defined as a given real percentage change in the price (with identical buying prices). On the real gain screen, all four real scenarios involved real gains. On the real loss screen, all four real scenarios involved real losses.

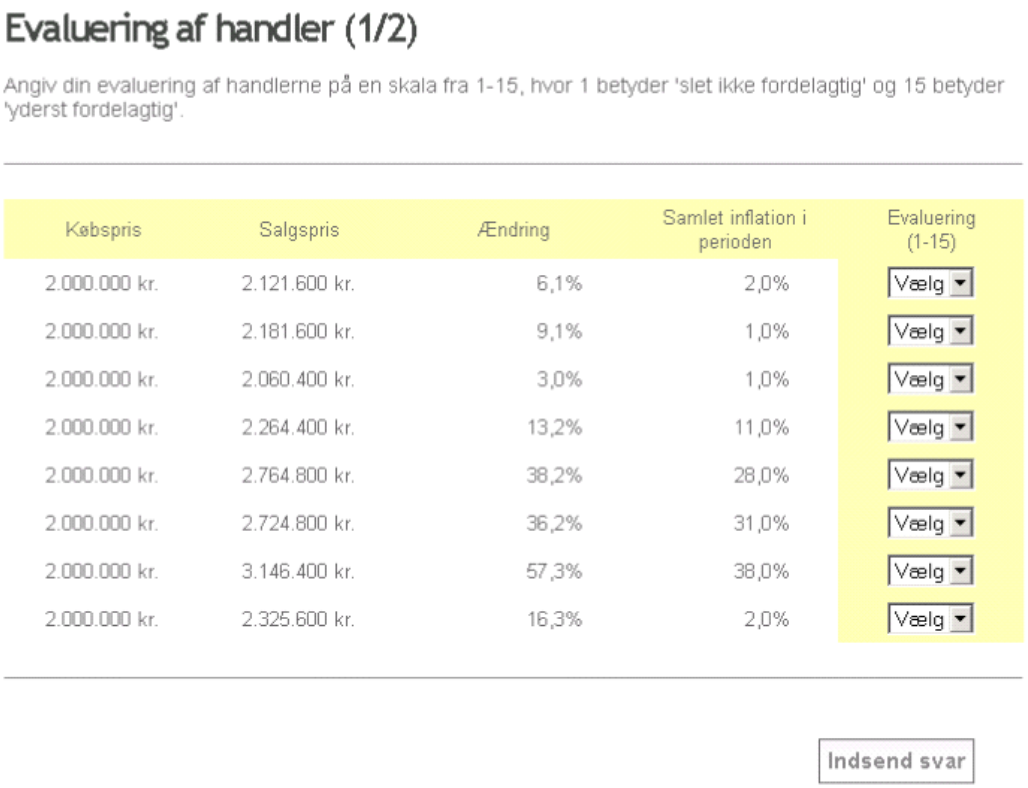
The question pairs were used to present each real scenario as two different **nominal scenarios**: a **high inflation** scenario and a **low inflation** scenario. In the four real scenarios on the real gain screen, the high inflation scenario made the gains **appear larger** in nominal terms. In the four real scenarios on the real loss screen, the high inflation scenario made the real losses **appear as nominal gains**.

In the precise treatment, the **real percentage gain or loss** from a given transaction is defined as

$$y = \frac{1+\Delta}{1+\pi} - 1,$$

where Δ is the percentage change in the price and π is the accumulated inflation.

Figure 15: Housing questions on real gain screen (precise treatment)



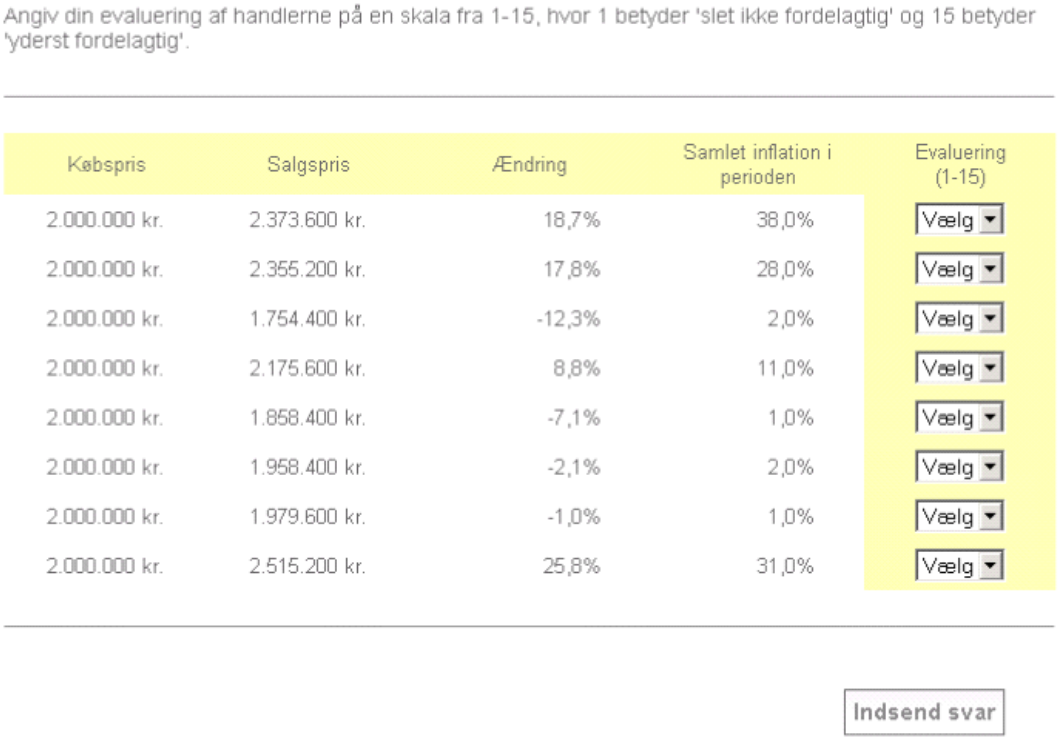
Evaluering af handler (1/2)

Angiv din evaluering af handlerne på en skala fra 1-15, hvor 1 betyder 'slet ikke fordelagtig' og 15 betyder 'yderst fordelagtig'.

Købspris	Salgspris	Ændring	Samlet inflation i perioden	Evaluering (1-15)
2.000.000 kr.	2.121.600 kr.	6,1%	2,0%	Vælg
2.000.000 kr.	2.181.600 kr.	9,1%	1,0%	Vælg
2.000.000 kr.	2.060.400 kr.	3,0%	1,0%	Vælg
2.000.000 kr.	2.264.400 kr.	13,2%	11,0%	Vælg
2.000.000 kr.	2.764.800 kr.	38,2%	28,0%	Vælg
2.000.000 kr.	2.724.800 kr.	36,2%	31,0%	Vælg
2.000.000 kr.	3.146.400 kr.	57,3%	38,0%	Vælg
2.000.000 kr.	2.325.600 kr.	16,3%	2,0%	Vælg

Indsend svar

Figure 16: Housing questions on real loss screen (precise treatment)



Evaluering af handler (2/2)

Angiv din evaluering af handlerne på en skala fra 1-15, hvor 1 betyder 'slet ikke fordelagtig' og 15 betyder 'yderst fordelagtig'.

Købspris	Salgspris	Ændring	Samlet inflation i perioden	Evaluering (1-15)
2.000.000 kr.	2.373.600 kr.	18,7%	38,0%	Vælg
2.000.000 kr.	2.355.200 kr.	17,8%	28,0%	Vælg
2.000.000 kr.	1.754.400 kr.	-12,3%	2,0%	Vælg
2.000.000 kr.	2.175.600 kr.	8,8%	11,0%	Vælg
2.000.000 kr.	1.858.400 kr.	-7,1%	1,0%	Vælg
2.000.000 kr.	1.958.400 kr.	-2,1%	2,0%	Vælg
2.000.000 kr.	1.979.600 kr.	-1,0%	1,0%	Vælg
2.000.000 kr.	2.515.200 kr.	25,8%	31,0%	Vælg

Indsend svar

Rule-of-thumb treatment

Figures 17 and 18 respectively show the real gain and real loss screens in the rule-of-thumb treatment. It was identical with the precise treatment, except that the real values were adjusted to match a common heuristic for deflating, so that the **approximate real percentage gain or loss**

$$\tilde{y} = \Delta - \pi,$$

rather than the real percentage gain or loss y, is the same within each pair. This means the real scenarios within each pair were not precisely the same, but would appear to be so to subjects using the common heuristic of subtracting the accumulated inflation from the nominal price change.

Overall

A total of 1045 subjects participated in the experiment, with 499 assigned to the precise treatment and 546 to the rule-of-thumb treatment.

The order of screens is as follows:

(a) Instructions: Subjects are told they will be presented with two screens containing various hypothetical housing transactions. An example screen is shown, with the following text:

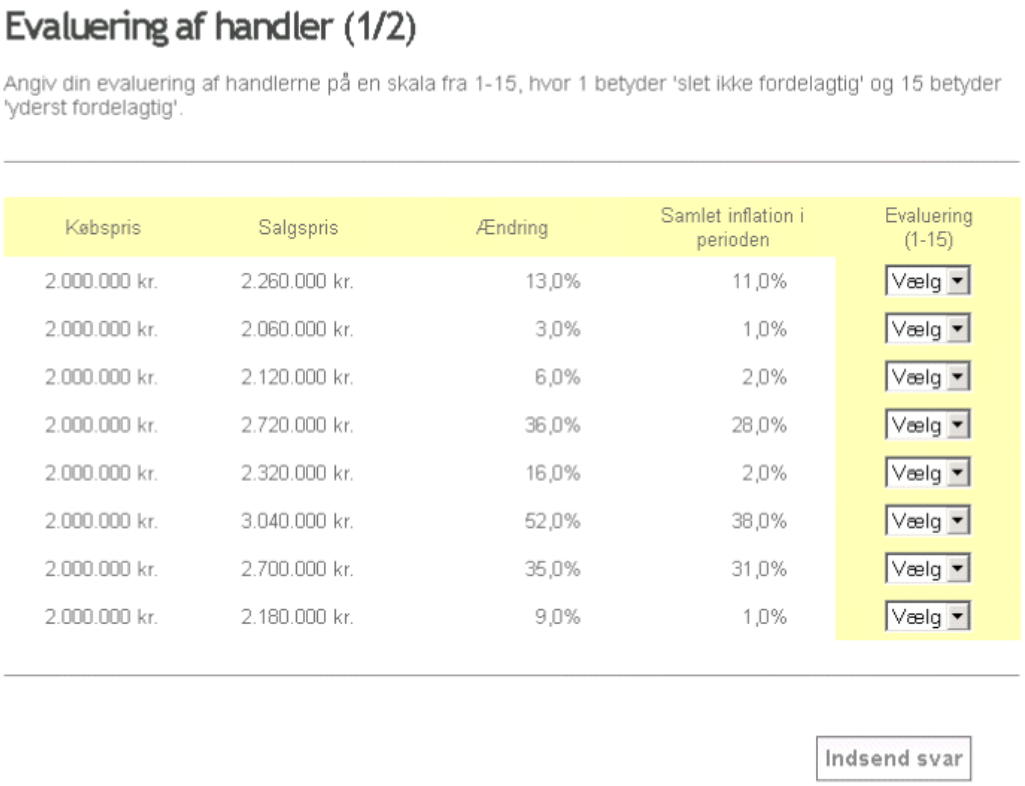
Imagine that someone has bought a house for the given buying price (købspris) and sold it some years later for the given selling price (salgspris). The Change (Ændring) column gives the difference between the buying and selling prices as a percentage. The last column gives the inflation (i.e. how much prices in society increased) in the period between the purchase and sale.

On the basis of the given information, you have to indicate how advantageous you think the transaction was, on a scale of 1 to 15, where 1 means 'not at all advantageous' and 15 means 'very advantageous'

(b) Question screen 1: Real gain or real loss screen (randomly selected with equal probability) for precise or rule-of-thumb treatment (see Figures 15–18)

(c) Question screen 2: Real gain or real loss screen (complement of question screen 1) for precise or rule-of-thumb treatment (see Figures 15–18)

Figure 17: Housing questions on real gain screen (rule-of-thumb treatment)



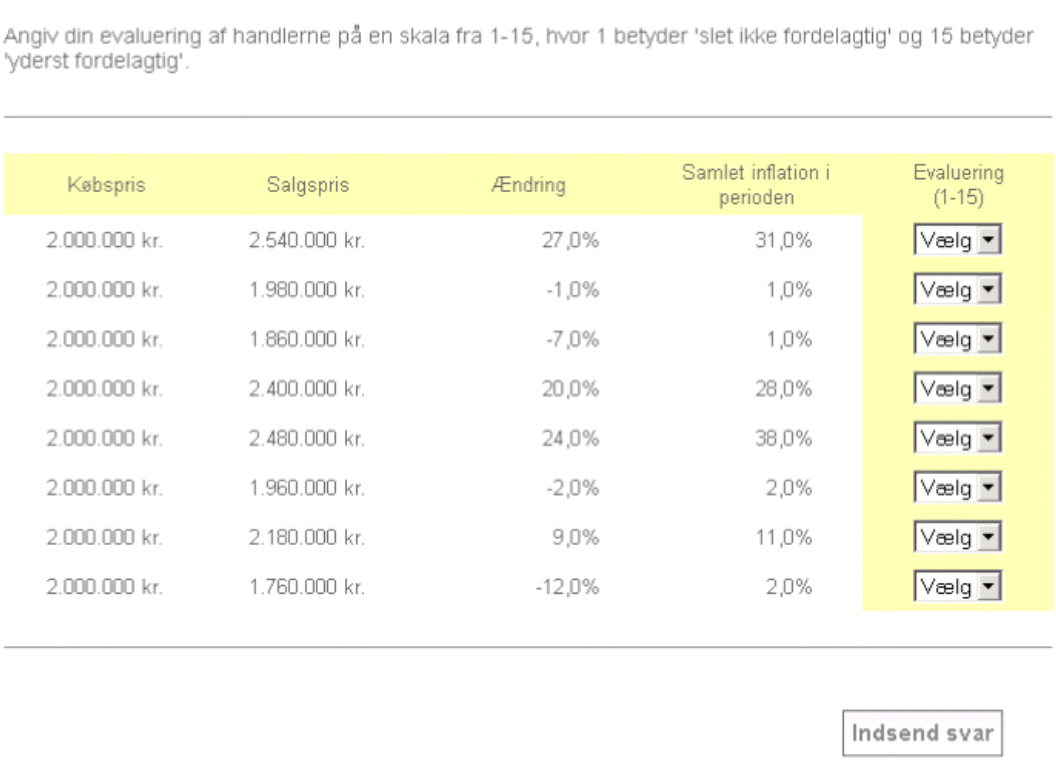
Evaluering af handler (1/2)

Angiv din evaluering af handlerne på en skala fra 1-15, hvor 1 betyder 'slet ikke fordelagtig' og 15 betyder 'yderst fordelagtig'.

Købspris	Salgspris	Ændring	Samlet inflation i perioden	Evaluering (1-15)
2.000.000 kr.	2.260.000 kr.	13,0%	11,0%	Vælg
2.000.000 kr.	2.060.000 kr.	3,0%	1,0%	Vælg
2.000.000 kr.	2.120.000 kr.	6,0%	2,0%	Vælg
2.000.000 kr.	2.720.000 kr.	36,0%	28,0%	Vælg
2.000.000 kr.	2.320.000 kr.	16,0%	2,0%	Vælg
2.000.000 kr.	3.040.000 kr.	52,0%	38,0%	Vælg
2.000.000 kr.	2.700.000 kr.	35,0%	31,0%	Vælg
2.000.000 kr.	2.180.000 kr.	9,0%	1,0%	Vælg

Indsend svar

Figure 18: Housing questions on real loss screen (rule-of-thumb treatment)



Evaluering af handler (2/2)

Angiv din evaluering af handlerne på en skala fra 1-15, hvor 1 betyder 'slet ikke fordelagtig' og 15 betyder 'yderst fordelagtig'.

Købspris	Salgspris	Ændring	Samlet inflation i perioden	Evaluering (1-15)
2.000.000 kr.	2.540.000 kr.	27,0%	31,0%	Vælg
2.000.000 kr.	1.980.000 kr.	-1,0%	1,0%	Vælg
2.000.000 kr.	1.860.000 kr.	-7,0%	1,0%	Vælg
2.000.000 kr.	2.400.000 kr.	20,0%	28,0%	Vælg
2.000.000 kr.	2.480.000 kr.	24,0%	38,0%	Vælg
2.000.000 kr.	1.960.000 kr.	-2,0%	2,0%	Vælg
2.000.000 kr.	2.180.000 kr.	9,0%	11,0%	Vælg
2.000.000 kr.	1.760.000 kr.	-12,0%	2,0%	Vælg

Indsend svar

Module 8: Questionnaire

This module contains questions about the family situation when the respondent was a child, religion, the "Jantelov", and a validation question on general understanding of instructions. None of these are incentivized. The questions were grouped in 4 screens and the order of screens is described below:

(a) Family situation as a child: (i) Where did you live at age 10? (ii) How many times per week did you have dinner with at least one of your parents? (iii) How many older siblings did you have? (iv) How many of these did you live with for at least 8 years, before you turned 18? (v) How many younger siblings did you have? (vi) How many of these did you live with for at least 8 years, before you turned 18?

(b) Religion: (i) What role does religion play in your everyday life (0-9 scale, where 0 is none, and 9 is great)? Subjects could choose not to answer. (ii) How often do you go to church/synagogue/mosque/equivalent? Choose from drop down list. Weddings, funerals, confirmations, and baptisms do not count. (iii) What role did religion play in your everyday life as a child (0-9 scale, where 0 is none, and 9 is great)? Subjects could choose not to answer. (iv) How often did you go to church/synagogue/mosque/equivalent at age 10? Choose from drop down list. Weddings, funerals, confirmations, and baptisms do not count.

(c) Janteloven: Subjects could click a popup button in the top right corner to read a definition of "Janteloven". (i) To what extent is your everyday life influenced by "Janteloven" (0-9 scale, where 0 is none, and 9 is great)? Subjects could choose "don't know/prefer not to answer". (ii) To what extent was your childhood influenced by "Janteloven" (0-9 scale, where 0 is none, and 9 is great)? Subjects could choose "don't know/prefer not to answer".

(d) Control of participation in earlier iLEE waves: The person addressed in the invitation letter has participated in (i) all three experiments? (ii) none of the experiments? (iii) one or two experiments (iv) I do not remember.

Module 9: End of part 1

This module ends part 1 of iLEE3. The order of screens was:

(a) Bank info: Two screens. **Bank info1:** Informed subjects that the experiment is now over and that they will be redirected to a screen where they can enter their bank info. **Bank info2:** We assure confidentiality. We ask subjects to type their registration and account numbers twice to prevent errors due to mistyping. They can only proceed to the next screen if the numbers match.

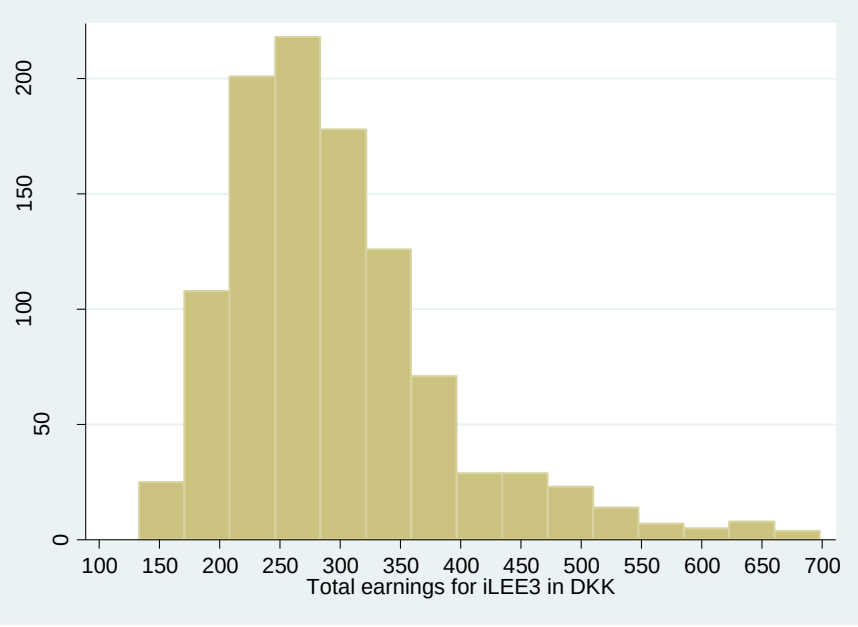
(b) Additional comments: Subjects are told that the date of the second part of the experiment was pushed back to October 1st. They are offered the option to give us their email address, such that we can contact them, when part 2 is ready.

Payoff information

92 percent of participants complete the entire wave within 100 minutes or less. Total completion times of more than 100 minutes are likely to be due to logout. Focusing only on those who spent less than 100 minutes, the average time spent was 42.8 minutes.

Figure 19 shows the distribution of payments for iLEE3. The average and median payments were DKK 297 and DKK 279, respectively.

Figure 19: Distribution of earnings



Appendix A: Invitation Letter

«Navn»
«Coadr»
«Adresse»
«By»
«Post» «Postdist»

Kære «Navn»

Danmarks Statistik og Internet Laboratoriet for Eksperimentel Økonomi (iLEE) ved Økonomisk Institut på Københavns Universitet inviterer dig hermed til at deltage i endnu et eksperiment vedrørende økonomiske beslutningsprocesser.

Din deltagelse er naturligvis frivillig, men vi håber meget, at du igen vil deltage, da det er interessant for os at se, hvordan beslutninger i de forskellige eksperimenter hænger sammen. **Dette eksperiment er åbent for deltagelse til og med søndag d. 15. august.**

Ved at deltage i eksperimentet får du mulighed for at tjene penge. Vi kan ikke garantere dig, at du vil tjene et bestemt beløb, idet din indtjening vil afhænge af dine egne samt andre deltageres beslutninger. De nærmere regler er beskrevet på hjemmesiden.

Dine beslutninger i eksperimentet bliver behandlet strengt fortroligt og anonymt. For at sikre deltagerne fuld anonymitet logger alle deltagere ind med et tilfældigt udvalgt nummer. For at se detaljerne om eksperimentet, herunder opgaven, tidsforbrug mv., bedes du snarest muligt logge ind på vores hjemmeside:

www.econ.ku.dk/ilee med dit login-nummer: [ID nummer]

Hvis du har problemer med at logge ind eller har yderligere spørgsmål, er du velkommen til at kontakte os enten ved at sende en email til **ilee@econ.ku.dk** eller ved at ringe til os på telefon 35 32 44 04.

Med venlig hilsen og på forhånd tak for din hjælp.

Isak Isaksen
Kontorchef, Danmarks Statistik

Jean-Robert Tyran
Professor, Økonomisk Institut

Appendix B: Reminder Letter

«Navn»
«Coadr»
«Adresse»
«By»
«Post» «Postdist»

Kære «Navn»

Danmarks Statistik og Internet Laboratoriet for Eksperimentel Økonomi (iLEE) ved Økonomisk Institut på Københavns Universitet inviterede dig for godt en måned siden til at deltage i et eksperiment vedrørende økonomiske beslutningsprocesser. Du blev inviteret, fordi du i maj måned 2008 gennemførte et lignende eksperiment. Din deltagelse er værdifuld for os, da det er interessant for os at se, hvordan beslutninger i de forskellige eksperimenter hænger sammen.

Eksperimentet er åbent til og med søndag d. 5. september, så alle får mulighed for at gennemføre. Hvis du ikke har logget ind endnu, håber vi, at du vil vælge at gøre det nu. Hvis du allerede har påbegyndt eksperimentet, vil du fortsætte, hvor du slap, når du logger ind igen.

For at se detaljerne om eksperimentet, herunder tidsforbrug, indtjeningsvilkår mv., bedes du snarest muligt logge ind på vores hjemmeside:

www.econ.ku.dk/ilee med dit login-nummer: «finalid_number»

Vi håber, at du vælger at gennemføre eksperimentet. Hvis du har problemer med at logge ind eller har yderligere spørgsmål eller behov for hjælp, er du velkommen til at kontakte os enten ved at sende en email til **ilee@econ.ku.dk** eller ved at ringe til os på telefon 35 32 44 04. Vi sidder klar ved telefonen alle dage mellem 14 og 15, og du er også velkommen til at prøve på andre tidspunkter.

Med venlig hilsen og på forhånd tak for din hjælp.

Isak Isaksen
Kontorchef, Danmarks Statistik

Jean-Robert Tyran
Professor, Økonomisk Institut