

# Online Appendix

for

## **Poverty and Economic Decision-Making: Evidence from Changes in Financial Resources at Payday**

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# Appendix A1.

## Baseline Survey (Study 1)

The baseline survey collected data on the arrival dates of all payments the participant (and his/her spouse) expected to receive during January 2013. Participants were first asked to indicate from which sources of income they expected to receive payments: wages and salaries; self-employment; unemployment compensation; Social Security or disability; public assistance or welfare; retirement income; or other sources of income.

Do you expect to receive income during **January 2013** from any of the following sources? Please check all that apply.

- ☐ Wages and Salaries
- ☐ Self-Employment
- ☐ Unemployment Compensation
- ☐ Social Security or Disability
- ☐ Public Assistance or Welfare
- ☐ Retirement Income
- ☐ Other Income

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They were then prompted to report the number of payments they expected to receive from each source.

How many times do you expect to receive payments from **Wages and Salaries** during **January 2013**?

- ☐ 1 time
- ☐ 2 times
- ☐ 3 times
- ☐ 4 times
- ☐ 5 or more times

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And enter the dates of the payments in a calendar.

Please mark on the calendar the date in **January 2013** on which you expect to receive the **FIRST** payment from **Wages and Salaries**.

January 2013						
Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

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We also asked them to report the dollar amount of each payment.

Please enter the amount of each payment you expect to receive from **Wages and Salaries** during **January 2013**.

Payments	
Date	Amount
Tue 15 Jan 2013	\$ <input type="text"/> .00
Tue 29 Jan 2013	\$ <input type="text"/> .00

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Finally, we inquired about the method of payment.

How do you expect to receive the payments from **Wages and Salaries**?

☐ Receive a check in the mail  
☐ Receive a check in person  
☐ Direct Deposit  
☐ Paid in Cash  
☐ Other, specify:

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The baseline survey also assessed financial strain using the following question from the survey Household Income and Labour Dynamics in Australia (HILDS).

Over the past 12 months, have any of the following happened to you because of a shortage of money?

☐ Could not pay electricity, gas or telephone bills on time  
☐ Could not pay for car registration or insurance on time  
☐ Pawned or sold something  
☐ Went without meals  
☐ Unable to heat home  
☐ Sought assistance from welfare/community organizations  
☐ Sought financial help from friends or family  
☐ Took a loan from a payday lender  
☐ None of the above

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Finally, it included self-assessments of one's economic circumstances.

Please indicate how strongly you agree or disagree with the following statements:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I live from paycheck to paycheck	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I regularly set aside money for saving	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often spend more money than I have	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I usually pay the credit card bills in full	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get myself into more debt each year	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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# Appendix A2.

## Baseline Survey (Study 2)

The baseline survey collected data on the arrival dates of all payments the participant (and his/her spouse) expected to receive between November 21<sup>st</sup>, 2014 and December 20<sup>th</sup>, 2014. Participants were first asked to indicate from which sources of income they expected to receive payments: wages and salaries; self-employment; unemployment compensation; Social Security or disability; public assistance or welfare; retirement income; or other sources of income.

Do you expect to receive income between **November 21st, 2014** and **December 20th, 2014** from any of the following sources? Please check all that apply.

☐ Wages and Salaries

☐ Self-Employment

☐ Unemployment Compensation

☐ Social Security or Disability

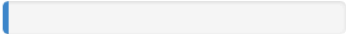
☐ Public Assistance or Welfare

☐ Retirement Income

☐ Other Income

☐ Do not expect to receive any income between November 21st, 2014 and December 20th, 2014

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They were then prompted to report the number of payments they expected to receive from each source.

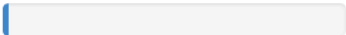
How many times do you expect to receive payments from **Wages and Salaries** between **November 21st, 2014** and **December 20th, 2014**?

☐ 1 time

☐ 2 times

☐ 3 or more times

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And enter the dates of the payments in a calendar.

Please mark on the calendar the date between **November 21st, 2014** and **December 20th, 2014** on which you expect to receive the **FIRST** payment from **Wages and Salaries**. Click on one of the blue tabs to select November or December.

**November 2014**

November 2014

December 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26	27	28	29	30	31	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	1	2	3	4	5	6

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We also asked them to report the dollar amount of each payment.

Please enter the dollar amounts of the payments you expect to receive between **November 21st, 2014** and **December 20th, 2014**.

**Payments**

<i>Date</i>	<i>Income Source</i>	<i>Dollar Amount</i>
11/21	Wages and Salaries	<div><div>\$</div><div></div><div>.00</div></div>
11/30	Wages and Salaries	<div><div>\$</div><div></div><div>.00</div></div>

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We followed up with a question about payments between November 1st 2014 and November 20th 2014 so we could calculate the number of days without payments before the first payment during the 11/21/2014-12/20/2014 reference period.

Have you already received or will you receive any payments **between November 1st, 2014 and November 20th, 2014** ? (Please consider all sources of income)

☐ Yes

☐ No

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If they answered yes, we asked them to enter the date in a calendar (image not shown here).

The baseline survey also assessed financial strain using the following question from the survey Household Income and Labour Dynamics in Australia (HILDS).


Over the past 12 months have any of the following happened to you because of a shortage of money?  
Please check all that apply.

- ☐ Could not pay electricity, gas or telephone bills on time
- ☐ Could not pay for car registration or insurance on time
- ☐ Pawned or sold something
- ☐ Overdrew any of your bank accounts
- ☐ Went without meals
- ☐ Unable to heat home
- ☐ Sought assistance from welfare/community organizations
- ☐ Sought financial help from friends or family
- ☐ Took a loan from a payday lender
- ☐ None of the above

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Participants were asked to report how strongly they agreed with the statement “I live from paycheck to paycheck.”

How strongly do you agree with the statement “**I live from paycheck to paycheck**”? Enter your answer by clicking on a point in the scale or by dragging the blue dot.



Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

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To measure credit constraints, we asked about credit card ownership, the credit limit, and whether participants would be able to raise \$2,000 in a week for an emergency.

How many credit cards or charge cards do you or other members of this household have? (Please enter 0 if no member of this household has a credit card or charge card)

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What is the maximum amount you could borrow on all of these accounts; that is, what is your total credit limit?

\$	<input type="text"/>	.00
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Suppose you had only one week to raise \$2,000 for an emergency. Which of the following best describes how hard it would be for you to get the money?

- ☐ I could easily raise the money
- ☐ I could raise the money, but it would involve some sacrifices
- ☐ I would have to do something drastic to raise the money
- ☐ I don't think I could raise the money

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We also included two questions to obtain a rough measure of assets and debt.

Consider cash, checking and savings accounts, stocks, bonds, mutual funds, certificates of deposit, T-bills, and government bonds owned by members of this household. What is the total value of these assets at this time?

\$  .00

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Consider credit card balances, medical debts, payday loans, student loans, and loans from relatives owed by members of this household. What is the total value of these debts at this time?

\$  .00

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Finally, we added the following question to identify participants who are forced to change their food consumption patterns because they run out of the money before the end of the pay cycle.

How strongly do you agree with the statement: **"Money starts to run out before the next payment arrives and we are forced to cut the size of meals, skip meals, or eat more low cost foods to make ends meet"**?

Enter your answer by clicking on a point in the scale or by dragging the blue dot.

Strongly Disagree Disagree Neutral Agree Strongly Agree

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# Appendix B1.

## Follow-up Survey (Study 1)

**Intertemporal Choices about Money (Study 1)**  
***Convex Time Budget (Andreoni and Sprenger 2012)***

Participants completed an incentivized intertemporal choice task modified from Andreoni and Sprenger (2012). Individuals were asked to intertemporally allocate an experimental budget of \$500 between two payments. The amount saved for the second check was paid with interest. Participants were asked to make twelve of these choices, in which we varied the experimental interest rate ( $r = 0\%$ ,  $0.5\%$ ,  $1\%$ , and  $3\%$ ), the mailing date of the first payment (today or in 4 weeks), and the time delay between the first and second payments (4 weeks or 8 weeks).

**Table B1. Parameters of Intertemporal Choice Task  
with Monetary Rewards (Convex Time Budget)**

	Mailing Dates of Payments		Interest rate
	Sooner	Later	
Choice #1	4 weeks	12 weeks	0%
Choice #2	4 weeks	12 weeks	0.5%
Choice #3	4 weeks	12 weeks	1%
Choice #4	4 weeks	12 weeks	3%
Choice #5	4 weeks	8 weeks	0%
Choice #6	4 weeks	8 weeks	0.5%
Choice #7	4 weeks	8 weeks	1%
Choice #8	4 weeks	8 weeks	3%
Choice #9	today	4 weeks	0%
Choice #10	today	4 weeks	0.5%
Choice #11	today	4 weeks	1%
Choice #12	today	4 weeks	3%



Whenever participants were prompted to make a choice, two checks—identical to the checks ALP participants receive every quarter for participating in the survey—were displayed, showing the dates and the amounts of each one of the two checks, and the name of the survey participant (see screenshot below). The amount of the second check included the interest paid on the amount saved for the second check, such that the participant did not have to calculate the interest herself. Approximately 1% of participants were selected at random to be paid based on one of their choices. The choice for which the participant was paid was randomly selected among the twelve choices the participant had made. Participants were sent (one or) two checks (at the dates specified in the task) in the amounts chosen by them in the task; the total dollar amount of the two checks was greater or equal to \$500.

A **0%** interest will be paid on the amount you save for the 2nd check (that is a **0%** annual interest rate).

**1st Check 4 weeks**

 1776 Main Street, P.O. Box 2138 Santa Monica, CA 90407-2138	<u>DATE</u>	<u>AMOUNT</u>
	12/09/2013	\$0.00
TO THE ORDER OF		
		
Bank of America Bank of America, N.A. Member FDIC	TWO SIGNATURES REQUIRED ON CHECKS EXCEEDING \$2,500 VOID 90 DAYS FROM DATE OF ISSUE	

**2nd Check 12 weeks**

 1776 Main Street, P.O. Box 2138 Santa Monica, CA 90407-2138	<u>DATE</u>	<u>AMOUNT</u>
	02/03/2014	\$0.00
TO THE ORDER OF		
		
Bank of America Bank of America, N.A. Member FDIC	TWO SIGNATURES REQUIRED ON CHECKS EXCEEDING \$2,500 VOID 90 DAYS FROM DATE OF ISSUE	

**Please choose the amount of the 1st check.  
You will receive the remainder, with interest, in your 2nd check.**



You can also enter your answer here: \$  .00



## Risk Choice Task (Study 1)

In the risk choice task (Eckel and Grossman 2002), participants were asked to choose one among six lotteries. Each lottery had a 50-50 chance, based on a coin flip, of paying either a lower or higher reward. Approximately ten percent of participants were selected at random to be paid based on one of their choices.

In what follows we will ask you to make a choice between 6 different gambles.  
Make your choice carefully because you may earn real money.  
And how much money you will earn will depend on the choice you make.

100 survey participants will be selected at random to earn real money.

*A lottery will be run in the end of this survey and you will learn whether you are one of the winners!*

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The 6 gambles are listed below.

Each gamble pays one amount if a tossed coin comes up heads and a different amount if it comes up tails.



The gambles differ on how much they pay depending on the outcome of the coin toss.

For example, if you chose gamble #4, you would be paid \$52 if the coin came up heads and \$16 if it came up tails.

If, instead, you chose gamble #5, you would be paid \$60 if the coin came up heads and \$12 if it came up tails.

Notice that there is no right or wrong answer. The chances of the coin coming up heads or coming up tails are the same.

Please choose a lottery by checking your option below.

Gamble			Choose Your Lottery
#1	\$28	\$28	<input type="radio"/>
#2	\$36	\$24	<input type="radio"/>
#3	\$44	\$20	<input type="radio"/>
#4	\$52	\$16	<input type="radio"/>
#5	\$60	\$12	<input type="radio"/>
#6	\$70	\$2	<input type="radio"/>

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### Loss Aversion (Fehr and Goette 2007) (Study 1)

We measured loss aversion using the lottery choice task in Fehr and Goette (2007). Subjects had to decide whether to accept or reject a series of six 50-50 lotteries. If they rejected, they received \$0. Each of the lotteries involved a possible gain of \$6 or a possible loss varying from \$2 to \$7.

In what follows we will ask you to make choices of whether to play or not a risky game. **If you play the game**, you receive one amount if a tossed coin comes up heads and a different amount if it comes up tails. **If you do not play the game**, you do not win nor lose any money.

For example, let's look at choice #1. If you play the game, you lose \$2 if the coin comes up heads and you win \$6 if it comes up tails.

This time you will not earn real money for your choices, but please make them carefully as if you were going to earn real money.

	If you play the game		If you do NOT play the game		Do you want to play the game?	
					Yes	No
Choice #1	Lose \$2	Win \$6	\$0	\$0	<input type="radio"/>	<input type="radio"/>
Choice #2	Lose \$3	Win \$6	\$0	\$0	<input type="radio"/>	<input type="radio"/>
Choice #3	Lose \$4	Win \$6	\$0	\$0	<input type="radio"/>	<input type="radio"/>
Choice #4	Lose \$5	Win \$6	\$0	\$0	<input type="radio"/>	<input type="radio"/>
Choice #5	Lose \$6	Win \$6	\$0	\$0	<input type="radio"/>	<input type="radio"/>
Choice #6	Lose \$7	Win \$6	\$0	\$0	<input type="radio"/>	<input type="radio"/>

## Flanker Task (Study 1)

Subjects were initially given basic instructions about the task: determine – as quickly as possible without making mistakes – the direction of the center arrow while ignoring the directions of the four arrows that surrounded the center arrow.

We will now play a game.

You will see 5 arrows in a row, all of which will be pointing either to the left or to the right.

You will be asked to determine the direction of the center arrow.

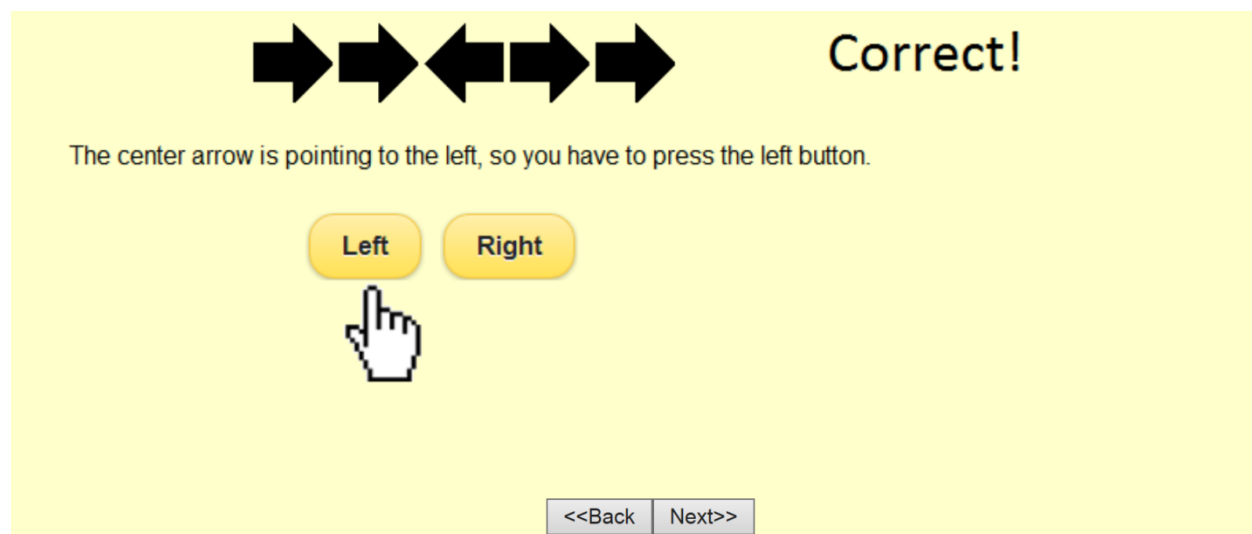
If it is pointing to the left, press the "left" button. If it is pointing to the right, press the "right" button. Always ignore the surrounding arrows, and respond only to the central arrow.

After you respond, you will be told whether you are correct.

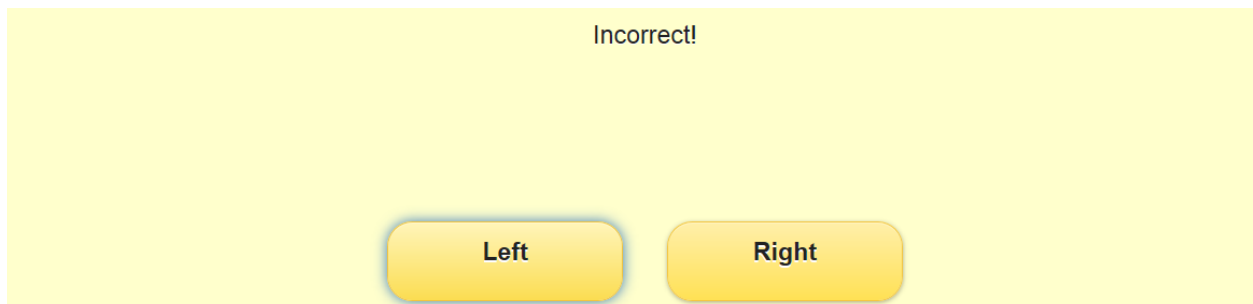
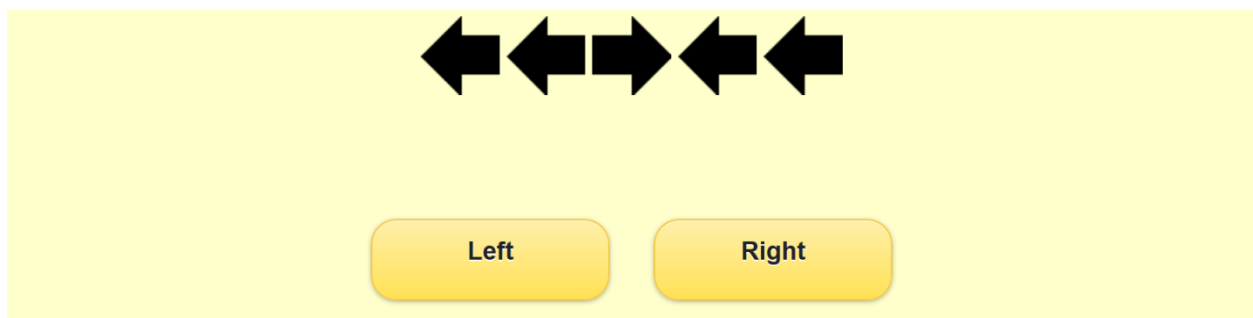
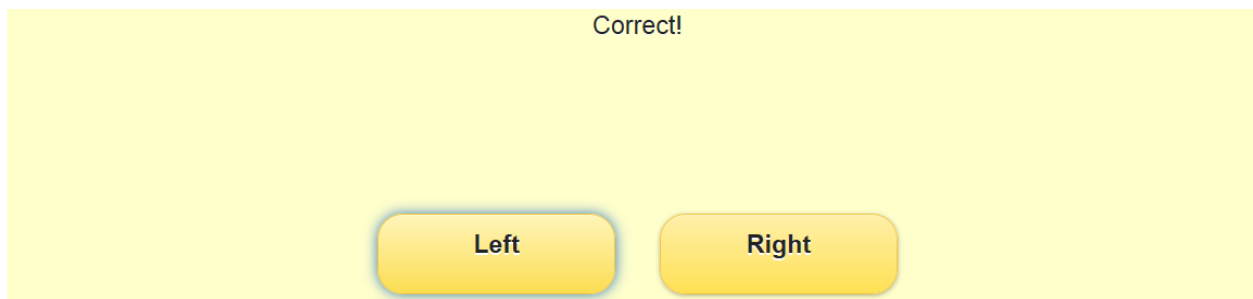
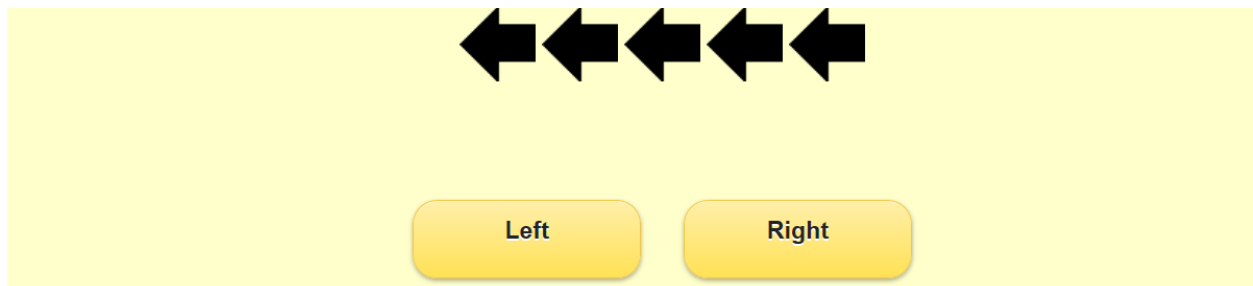
In the next screen we will show you an example.

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An illustrative example was given, followed by a practice round with three trials.



Participants were given feedback about their responses during the practice round.



One screen marked the end of the practice trial.

Now you are ready. Let's play!

A circle will be shown before each row of arrows. Keep your eyes on the circle.

Answer as fast as you can without making mistakes.

If you make a mistake, just keep going.

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The circle marked the transition between trials.



Left

Right



Left

Right

### Simplicity Seeking Task (Iyengar and Kamenica 2010) (Study 1)

In this task participants had to choose among several lotteries whose outcome depended on the roll of a dice. Half of participants were assigned to the “extensive condition” in which they had to choose between 11 lotteries. The other half was assigned to the “limited condition,” having to choose among 3 lotteries. Both choice sets included a lottery that paid \$0 if the dice landed on 1, 2, or 3 and \$10 otherwise. This all-or-nothing lottery was riskier than all other lotteries. The task was designed to investigate whether subjects assigned to the “extensive condition,” who may experience choice and cognitive overload, are more likely to choose the all-or-nothing lottery than subjects assigned to the “limited condition.”

We would like you now to choose between the different lotteries shown in the table below. Each row represents one possible choice.

You should think carefully about your choice because you may earn real money! 10 survey participants will be selected at random to earn real money. If you are one of them, your payment will depend on the choice you make and on a roll of a die. The die will determine which column you are paid for.

If, for example, you choose the second row and the die falls on 2, you will receive \$0.75 according to the randomly selected row.

Please choose your favorite row now:

#### Extensive Condition

Row	If the die falls on 1, you receive	If the die falls on 2, you receive	If the die falls on 3, you receive	If the die falls on 4, you receive	If the die falls on 5, you receive	If the die falls on 6, you receive
1	\$0.75	\$9.25	\$8.75	\$7.00	\$1.25	\$1.50
2	\$0.00	\$0.75	\$4.25	\$5.50	\$8.50	\$9.75
3	\$0.00	\$0.00	\$0.00	\$10.00	\$10.00	\$10.00
4	\$1.00	\$2.00	\$6.75	\$7.50	\$5.75	\$4.75
5	\$1.00	\$7.50	\$0.75	\$6.50	\$5.50	\$6.75
6	\$8.00	\$0.00	\$2.75	\$9.75	\$0.00	\$8.75
7	\$0.50	\$3.00	\$1.50	\$9.75	\$7.00	\$6.50
8	\$2.50	\$3.25	\$9.50	\$1.50	\$10.00	\$1.50
9	\$8.50	\$3.25	\$2.50	\$8.50	\$0.00	\$5.50
10	\$2.00	\$3.25	\$3.75	\$9.25	\$7.75	\$2.00
11	\$4.50	\$4.50	\$8.75	\$8.50	\$0.75	\$1.25

#### Limited Condition

Row	If the die falls on 1, you receive	If the die falls on 2, you receive	If the die falls on 3, you receive	If the die falls on 4, you receive	If the die falls on 5, you receive	If the die falls on 6, you receive
1	\$1.00	\$2.00	\$6.75	\$7.50	\$5.75	\$4.75
2	\$0.00	\$0.00	\$0.00	\$10.00	\$10.00	\$10.00
3	\$5.50	\$7.50	\$0.75	\$6.75	\$1.00	\$6.50

### Intertemporal Choices about Real Effort (Study 1)

We also administered a task in which participants made intertemporal choices over real effort. Specifically, they were asked to choose in a multiple “time” list whether they would prefer to complete a 30 minutes survey at a later date or a shorter survey at an earlier date. Subjects were asked to make ten of these choices, in which we varied the length of the sooner survey (15, 18, 21, 24, or 27 minutes) and the deadline of the shorter sooner survey (5 days or 90 days). The difference between the deadline of the shorter-sooner and longer-later surveys were always held constant at 30 days.

In one multiple “time” list participants were presented with five binary choices, a 30-minute survey completed within 35 days vs. a shorter survey completed within 5 days.

Please make your decision carefully. This may be the module you will have to answer to win your \$50 Amazon gift certificate.

The first 5 modules can either be answered in **the next 5 days (short module)** or in **the next 35 days (long module)**

	Short Module Before 11/16/2013	OR	Long Module Before 12/16/2013
Choice #1	<input checked="" type="radio"/> 15 minutes		<input type="radio"/> 30 minutes
Choice #2	<input type="radio"/> 18 minutes		<input type="radio"/> 30 minutes
Choice #3	<input type="radio"/> 21 minutes		<input type="radio"/> 30 minutes
Choice #4	<input type="radio"/> 24 minutes		<input type="radio"/> 30 minutes
Choice #5	<input type="radio"/> 27 minutes		<input type="radio"/> 30 minutes

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In the second multiple “time” list, the shorter survey lengths were the same but the deadlines were then shifted back to 90 days and 120 days.

Please make your decision carefully. This may be the module you will have to answer to win your \$50 Amazon gift certificate.

The last 5 modules can either be answered in **the next 90 days (short module)** or in **the next 120 days (long module)**

	<b>Short Module Before 02/09/2014</b>	<b>OR</b>	<b>Long Module Before 03/11/2014</b>
Choice #6	<input type="radio"/> 15 minutes		<input type="radio"/> 30 minutes
Choice #7	<input type="radio"/> 18 minutes		<input type="radio"/> 30 minutes
Choice #8	<input type="radio"/> 21 minutes		<input type="radio"/> 30 minutes
Choice #9	<input type="radio"/> 24 minutes		<input type="radio"/> 30 minutes
Choice #10	<input type="radio"/> 27 minutes		<input type="radio"/> 30 minutes

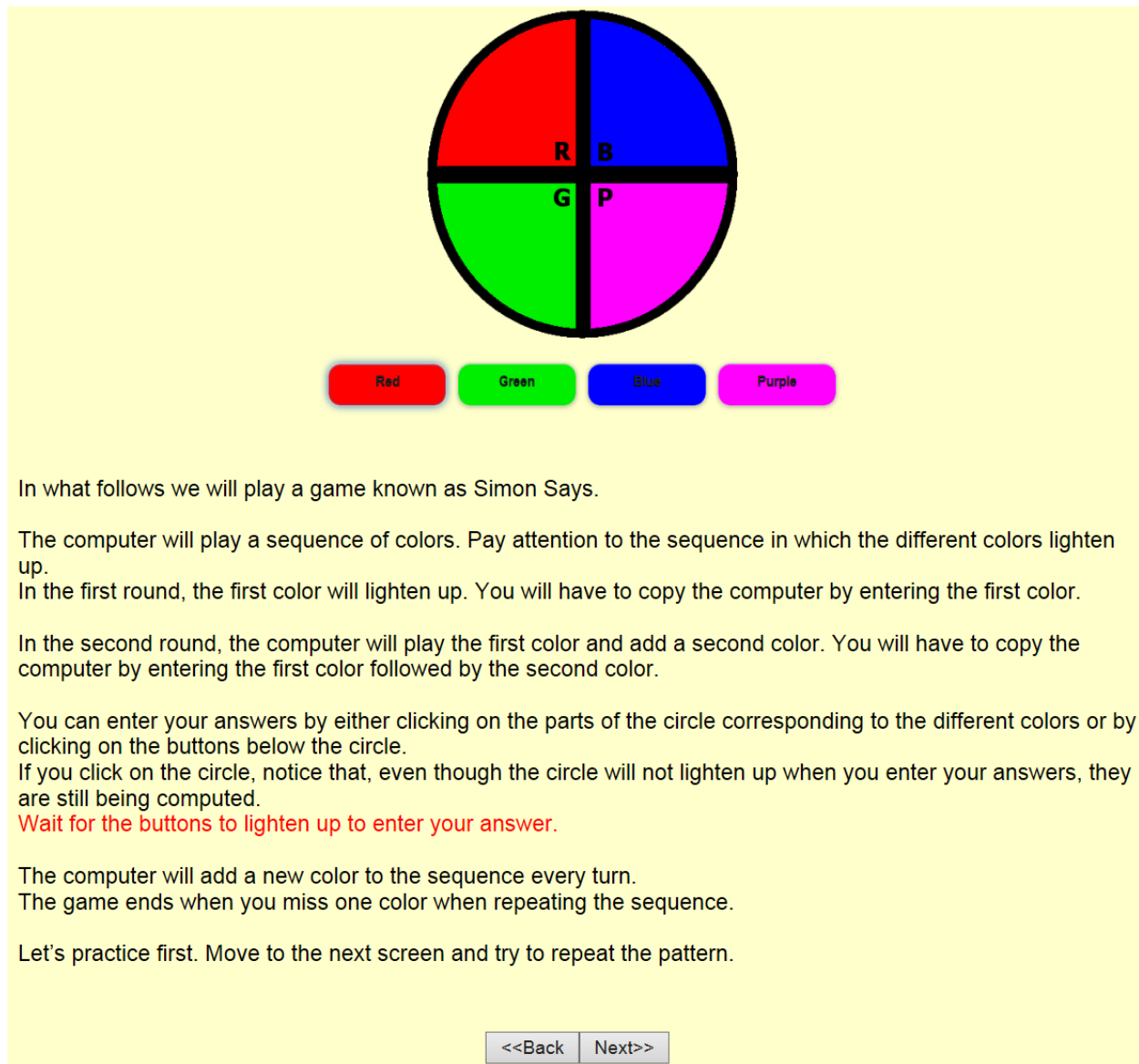
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Approximately one percent of participants were selected at random to have their choices implemented (one among the participant’s ten choices was randomly selected for implementation). “Implementation surveys” were sent to those selected participants. If they completed them before the deadline, they received a \$50 Amazon gift card and \$20 was added to the quarterly check they regularly receive for participating in ALP surveys. The dates of these payments were fixed and thus did not depend on when respondents finished the implementation surveys (as long as they completed before the deadline).

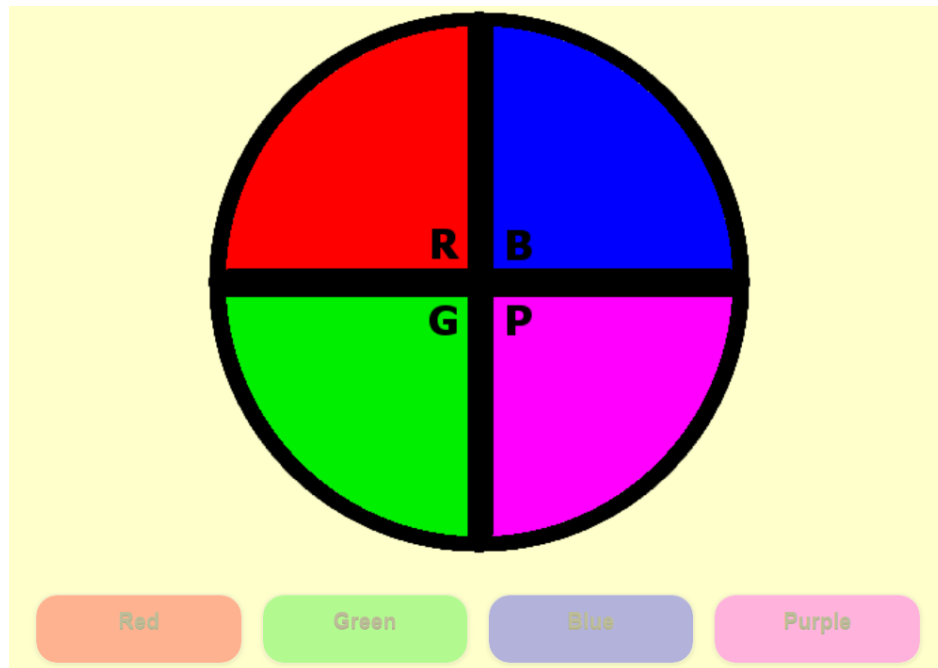


## Working Memory - Simon (Study 1)

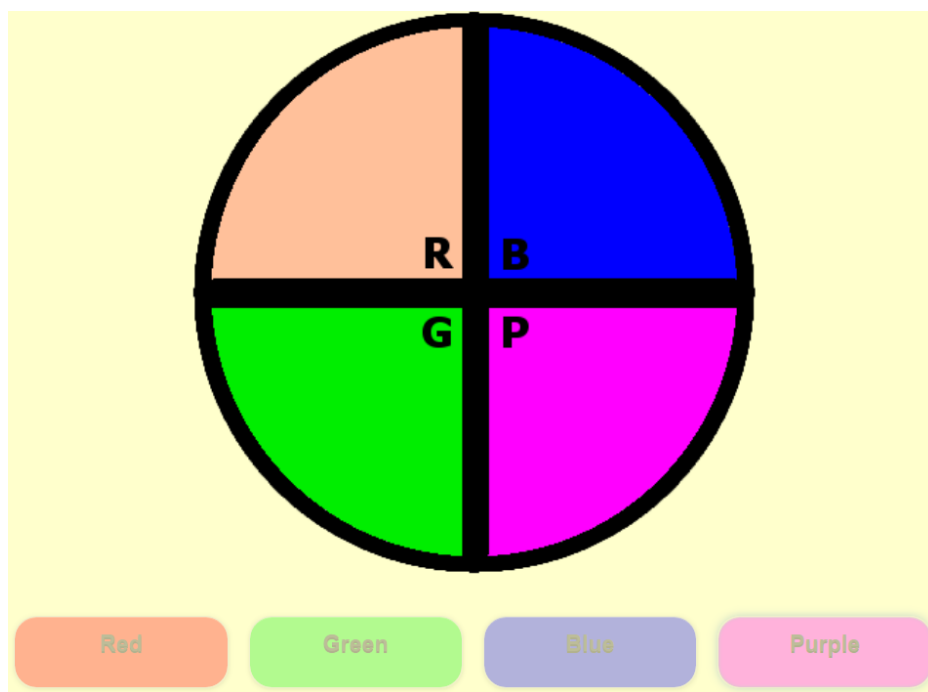
We adapted the memory game *Simon* made by Milton Bradley for our web-based survey: [http://en.wikipedia.org/wiki/Simon\\_%28game%29](http://en.wikipedia.org/wiki/Simon_%28game%29). Participants were first given instructions about what they were supposed to do in the task and how to use the interface to enter their answers.



The instructions were followed by a practice trial with a three-color sequence.

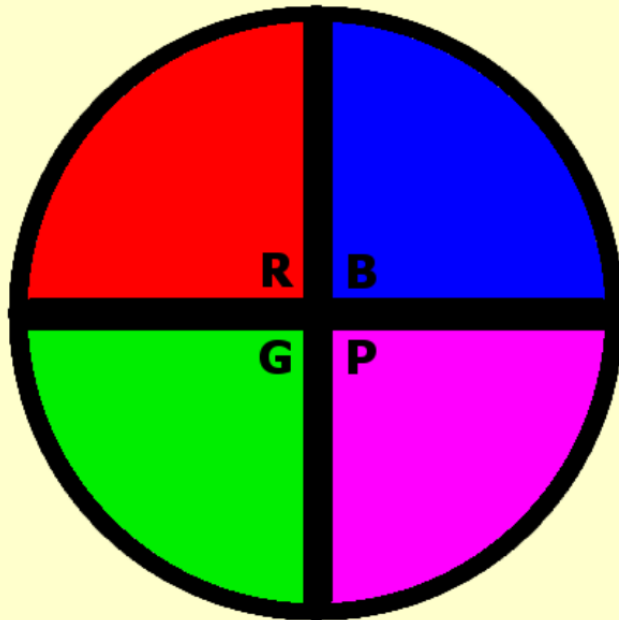


The figure above shows the circle at its default mode.  
The one below shows the circle with its red quadrant lit up.



During the practice trials participants were given feedback about their responses.

You clicked on PURPLE but the correct was RED. Try again from the beginning.



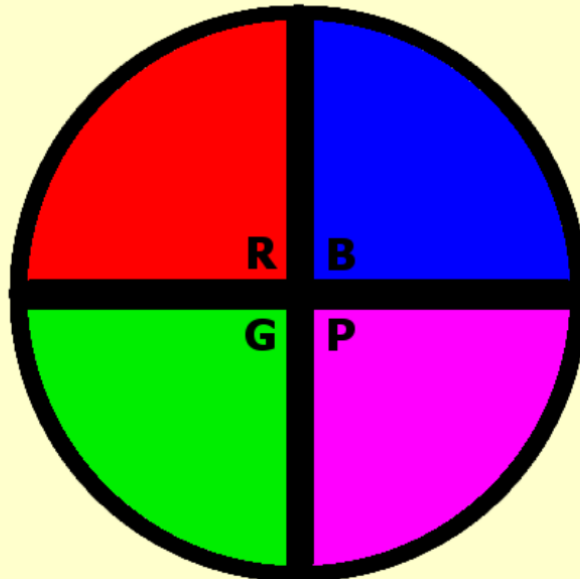
Red

Green

Blue

Purple

Good job! You correctly repeated the patterns.



Red

Green

Blue

Purple

### **Gambler's Fallacy (Toplak et al. 2011) (Study 1)**

“Gambler’s Fallacy” is the incorrect belief that after one particular realization of a random variable the next realization of the random variable will be different (e.g., the chances of a coin coming up heads in the next toss are higher than 50 percent because the coin came up tails in the previous three tosses). This behavior derives from the failure to understand the probability concept of independence.

We measured subjects’ tendency to believe in the gambler’s fallacy by using a test proposed by Toplak et al. (2011):

When playing slot machines, people win something about 1 in every 10 times. Julie, however, has just won on her first three plays. What are her chances of winning the next time she plays?

out of

The subject was identified as believing in the Gambler’s Fallacy if s/he gave an answer different from 1 out of 10 (or 10 out of 100, etc.).

### **Framing (Tversky and Kahneman 1981) (Study 1)**

Sensitivity to framing was measured using the “disease problem” proposed by Tversky and Kahneman (1981). In this problem the subject is asked to choose between two programs. Half of the participants were randomly assigned to Frame #1, which frames the effects of the two programs in terms of number of lives saved. The other half was assigned to Frame #2, which frames the effects in terms of number of deaths.

The introduction to the problems was the same for the two frames.

Imagine that the United States is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

#### **Frame #1**

- If Program A is adopted, 200 people will be saved.
- If Program B is adopted, there is a 1 in 3 chance that 600 people will be saved, and a 2 in 3 chance that no people will be saved.

#### **Frame #2**

- If Program A is adopted 400 people will die.
- If Program B is adopted there is a 1 in 3 chance that nobody will die, and a 2 in 3 chance that 600 people will die.

Which of the two programs would you favor?

- ☒ Program A  
☐ Program B

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### Financial Circumstances (Study 1)

1. About how much did you and your household **spend on everything** in the **last 7 days**? Please think about all bills such as rent, mortgage loan payments, utility and other bills, as well as all expenses such as food, clothing, transportation, entertainment and any other expenses you and your household may have.
2. Now I am going to ask about **expenses for food, beverages and other items** you and/or your household purchased in the **last 7 days**. What was your or your household expense for **grocery shopping** in the **last 7 days**?
3. What was your or your household's expense in the **last 7 days** for **meals or snacks from restaurants, fast food places, cafeterias, carryouts** or other such places?
4. We'd also like you to provide your best estimate of your household spending in the last 7 days for the following categories.
  - **Eggs & Dairy Products** (butter, cream, cheese, ice cream, skim milk, powdered milk, etc.)
  - **Fruits & Fruit Juices** (apples, bananas, cranberry juice, oranges, orange juice, etc.)
  - **Vegetables & Vegetable juices** (beans, corn, lettuce, potatoes, tomatoes, tomato juice, etc.)
  - **Entertainment/Amusements & Sports/Recreation** (admissions to movies, clubs, sporting & cultural events, camping, CDs, concert tickets, hunting, sports & exercise equipment, tapes, toys, TVs, video/stereo equipment, video purchase/rental, etc.)
  - **Gasoline and other fuels** (including gasohol)
5. About how much **cash** do you and other members of your household have in your wallet, purse, and/or pocket, elsewhere in your home, car, office, etc?
6. Do you or anyone in your family living here have any checking or savings accounts?
7. How much money do you and your family have in these accounts?

### Subjective Perception of Scarcity (Study 1)

How hard do you think it will be to cover expenses you expect to have in the next 5 days with the money you have now? [From 1 to 5, 1 meaning very hard and 5 meaning very easy]

- ☐ 1 Very Hard
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 Very Easy

Suppose you had only one week to raise \$2,000 for an emergency. Which of the following best describes how hard it would be for you to get the money?

- ☒ I could easily raise the money
- ☐ I could raise the money, but it would involve some sacrifices
- ☐ I would have to do something drastic to raise the money
- ☐ I don't think I could raise the money

How satisfied are you with the current financial situation of your household? [From 1 to 5, 1 meaning completely dissatisfied and 5 meaning completely satisfied]

- ☒ 1 Completely dissatisfied
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 Completely satisfied

How stressed do you feel about your personal finances? [From 1 to 5, 1 meaning overwhelmingly stressed and 5 meaning not stressed at all]

- ☒ 1 Overwhelmingly stressed
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 Not stressed at all

**Cognitive Reflection Test (Frederick 2005) (Study 1)**

(1) A bat and a ball cost \$1.10 in total. The bat costs \$1.00 more than the ball. How much does the ball cost?

(2) If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?

(3) In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?



### Subjective Well-Being (Study 1)

Now, we would like to learn about how you felt **yesterday**.

***How did you feel?*** Please rate each feeling on the scale given.

A rating of 0 means that you did not experience that feeling at all. A rating of 6 means that this feeling was a very important part of the experience. Please mark the number between 0 and 6 that best describes how you felt **yesterday**.

Happy.....	0	1	2	3	4	5	6
Frustrated/annoyed.....	0	1	2	3	4	5	6
Depressed/blue.....	0	1	2	3	4	5	6
Worried/anxious.....	0	1	2	3	4	5	6
Enjoying myself.....	0	1	2	3	4	5	6
Tired.....	0	1	2	3	4	5	6

### Psychological Stress (Study 1)

We used the Perceived Stress Scale (PSS) (Cohen et al. 1988) to measure psychological stress:

The questions in this scale ask you about your feelings and thoughts during the **last couple of days**. In each case, please indicate with a check how often you felt or thought a certain way.

1. In the **last couple of days**, how often have you been upset because of something that happened unexpectedly?
2. In the **last couple of days**, how often have you felt that you were unable to control the important things in your life?
3. In the **last couple of days**, how often have you felt nervous and "stressed"?
4. In the **last couple of days**, how often have you felt confident about your ability to handle your personal problems?
5. In the **last couple of days**, how often have you felt that things were going your way?
6. In the **last couple of days**, how often have you found that you could not cope with all the things that you had to do?
7. In the **last couple of days**, how often have you been able to control irritations in your life?
8. In the **last couple of days**, how often have you felt that you were on top of things?
9. In the **last couple of days**, how often have you been angered because of things that were outside of your control?
10. In the **last couple of days**, how often have you felt difficulties were piling up so high that you could not overcome them?

\_\_\_0=never \_\_\_1=almost never \_\_\_2=sometimes \_\_\_3=fairly often \_\_\_4=very often

Cohen, S., & Williamson, G. (1988). Perceived stress in a probability sample of the United States. In S. Spacapan & S. Oskamp (Eds.), The social psychology of health: Claremont Symposium on applied social psychology. Newbury Park, CA: Sage.

### **Credit Cards and Payday Loans (Study 1)**

Finally, the Study 1 follow-up survey included the following questions about credit cards and payday loans:

1. How many credit cards or charge cards do you or anyone in your family living here have?
2. After the last payments were made, roughly what was the total balance still owed on all these accounts?
3. What is the maximum amount you could borrow on all of these accounts; that is, what is your total credit limit?
4. What interest rate do you pay on the card where you have the largest balance?
5. Thinking only about the cards you can pay off over time, and store cards, do you almost always, sometimes, or hardly ever pay off the total balance owed on the account each month?
  - Always or almost always
  - Sometimes
  - Hardly ever
6. What is your most recent credit rating, as measured by a FICO score?
  - Below 600
  - 600–649
  - 650–699
  - 700–749
  - 750–800
  - Above 800
  - I don't know
7. How many times in the last 12 months did you or anyone in your household use payday loan or payday advance services? In answering this question, please count a rollover of a payday loan as a new loan and also count using a new payday loan to pay off an old one, as a separate new loan.  
\_\_\_\_\_ times in a year
8. What is the main reason for using payday loan or payday advance services rather than a bank?
  - The payday loan service is more convenient
  - It is easier to get a payday loan than to qualify for a bank loan
  - A payday loan service feels more comfortable than using a bank
  - Don't qualify for a bank loan
  - Other (Specify)

# Appendix B2.

## Follow-up Survey (Study 2)

Because of budget limitations, we could not afford to administer all the questions we wanted to field to all respondents. We decided therefore to design three different surveys and to randomly assign participants to one of the three surveys. Participants were assigned to group I with probability 45%, to group II with probability 10%, and to group III with probability 45%.

The table below shows the structure of the survey administered to participants assigned to groups I, II, and III.

<b>Group I</b>	<b>Group II</b>	<b>Group III</b>
Numerical Stroop	Priming	Numerical Stroop
Financial Circumstances	Numerical Stroop	Financial Circumstances
	Financial Circumstances	Risk Choice Task
Purchases of Durable Goods		
Food Consumption		
Subjective Perception of Scarcity		

## Numerical Stroop (Study 2)

In the Numerical Stroop task, participants were presented with a number, e.g. 888, where a digit is repeated a number of times. The participant must identify the number of times the digit is repeated, i.e. 3, rather than name the digit itself. We follow as closely as possible the protocol used in Mani et al. (2013). The initial instructions gave an example for illustrative purposes.

Now we want to ask you to complete a game to measure your concentration. Your task is to identify the **number of digits** shown on the screen. Do not name the digit itself.

In this example the correct answer is 4 because 4 digits are shown. Ignore that the digit 3 is shown.

**3333**

You will use the blue buttons below to enter your answers.

0 1 2 3 4 5 6 7 8 9

Next you will have the opportunity to practice.

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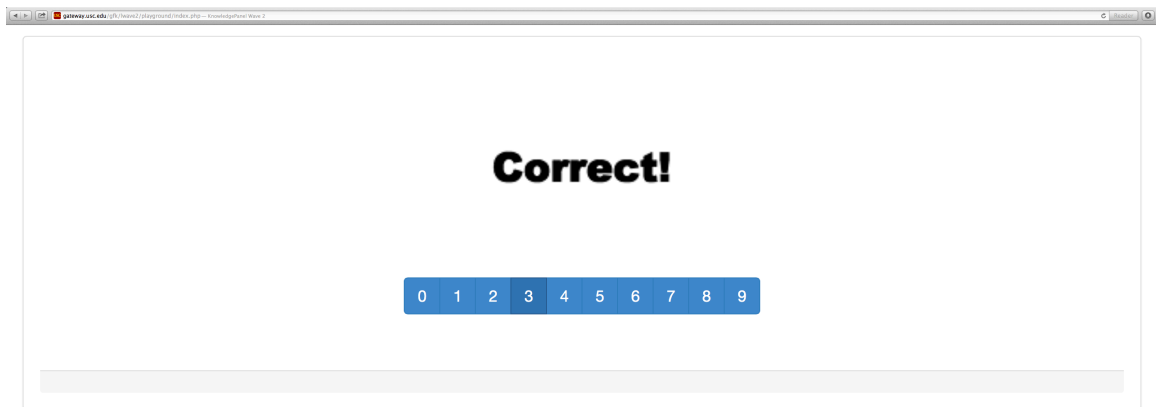
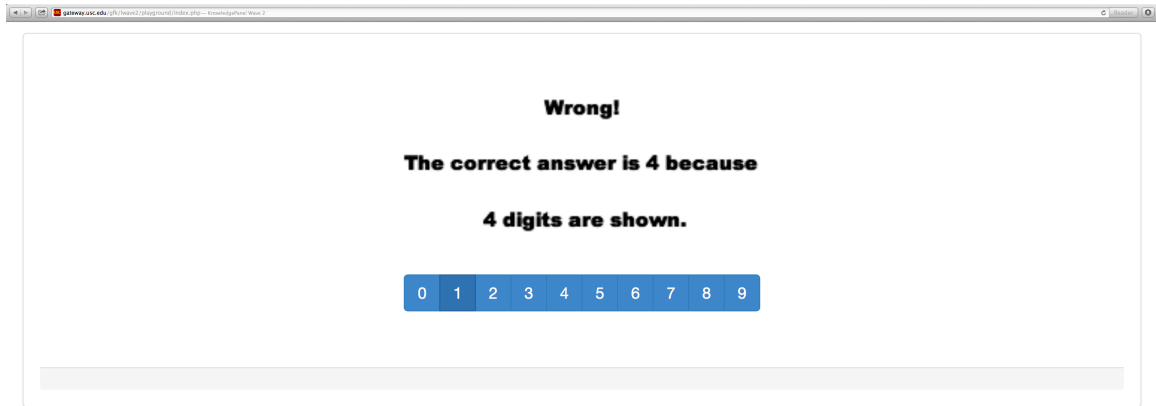
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There were two practice trials.

5555

0 1 2 3 4 5 6 7 8 9

Participants were given feedback during the practice trials.



One screen marked the end of the practice trials.

Now you are ready. Let's play.

A plus sign will be shown before each set of digits. Keep your eyes on the plus sign.

**Please answer as quickly as possible without making mistakes.** If you make a mistake, just keep going.  
We will be timing your response and keeping track of your mistakes.

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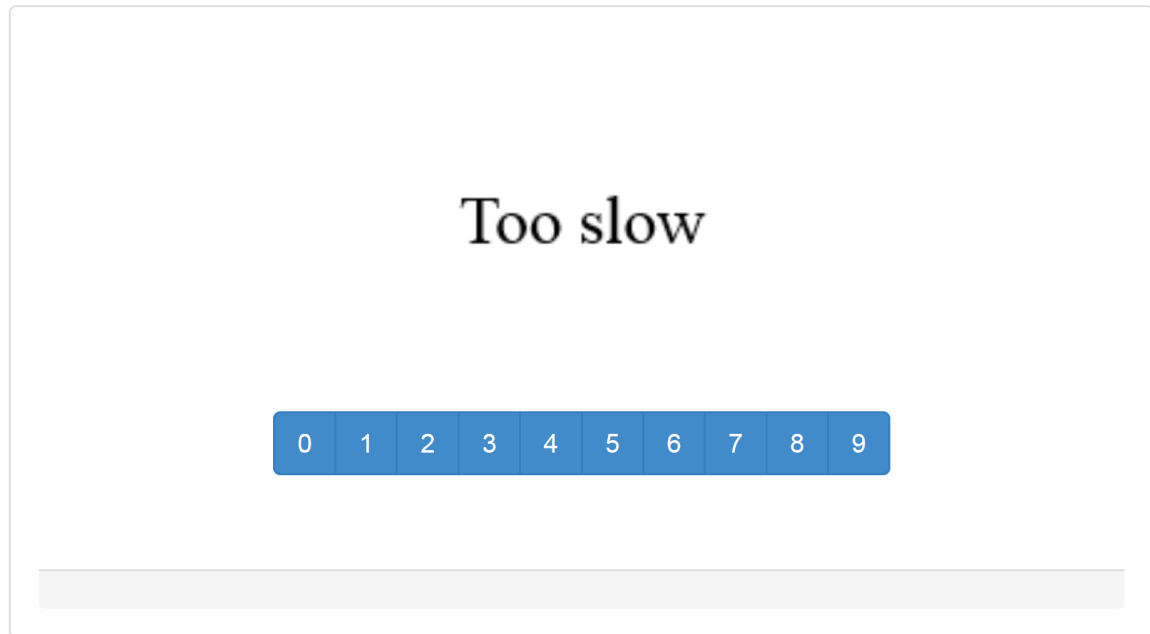
The plus sign marked the transition between trials.

+

0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---



Participants had 5 seconds to respond in each trial. If they did not, they were shown the sign “Too slow.” In the analysis the response time is right censored at 5,000 milliseconds (these answers were coded as incorrect when constructing the measures of accuracy).



Participants were administered 48 trials, the subgroup of the 72 trials conducted by Mani et al. (2013) that excluded repeats.

## **Priming (Study 2)**

We adapted the priming questions used in Mani et al (2013)'s New Jersey study to turn them into non-open-ended questions.

The economy is going through difficult times; suppose your employer needs to make substantial budget cuts. Imagine a scenario in which you received a 15% cut in your salary. Given your situation,

	Yes	No
...would you be able to maintain roughly your same lifestyle under those new circumstances?	<input type="radio"/>	<input type="radio"/>
...would it impact your leisure, housing, or travel plans?	<input type="radio"/>	<input type="radio"/>

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Imagine that an unforeseen event requires of you an immediate \$2,000 expense.

	Yes	No
Are there ways in which you may be able to come up with that amount of money on a very short notice?	<input type="radio"/>	<input type="radio"/>
Would it cause you long-lasting financial hardship?	<input type="radio"/>	<input type="radio"/>
Would it require you to make sacrifices that have long-term consequences?	<input type="radio"/>	<input checked="" type="radio"/>

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Imagine that your car is having some trouble, and requires a \$1,500 service. Unfortunately, your auto insurance will cover only 10% of this cost. Which would you choose?

- ☐ Pay the full amount in cash.
- ☐ Take out a loan, which you can pay back in monthly installments. A typical such loan may require monthly payments of roughly \$150 a month for 12 months, which would amount to about \$1800 total.
- ☐ Take a chance, forego the service, and hope that the car lasts for a while longer. Of course, this leaves open the possibility of breakdown, or even greater expenses in the long run.

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Suppose you have reached the point where you must replace your old refrigerator. The model you plan to buy offers two alternative financing options. Make your choice:

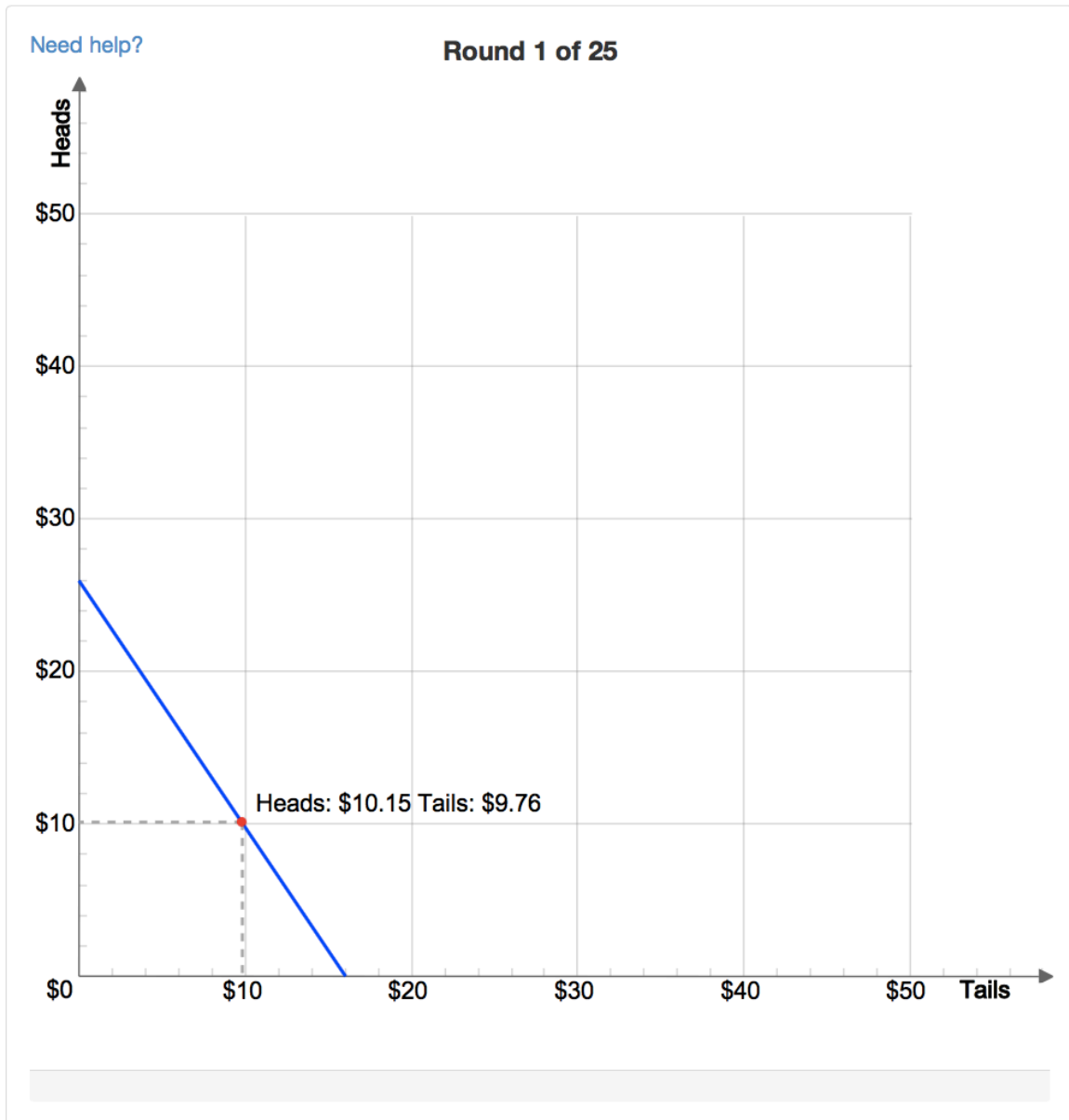
- ☐ You can pay the full amount in cash, which will cost you \$999.
- ☐ You can pay in 12 monthly payments, of \$100 each, which would amount to a total of \$1200.

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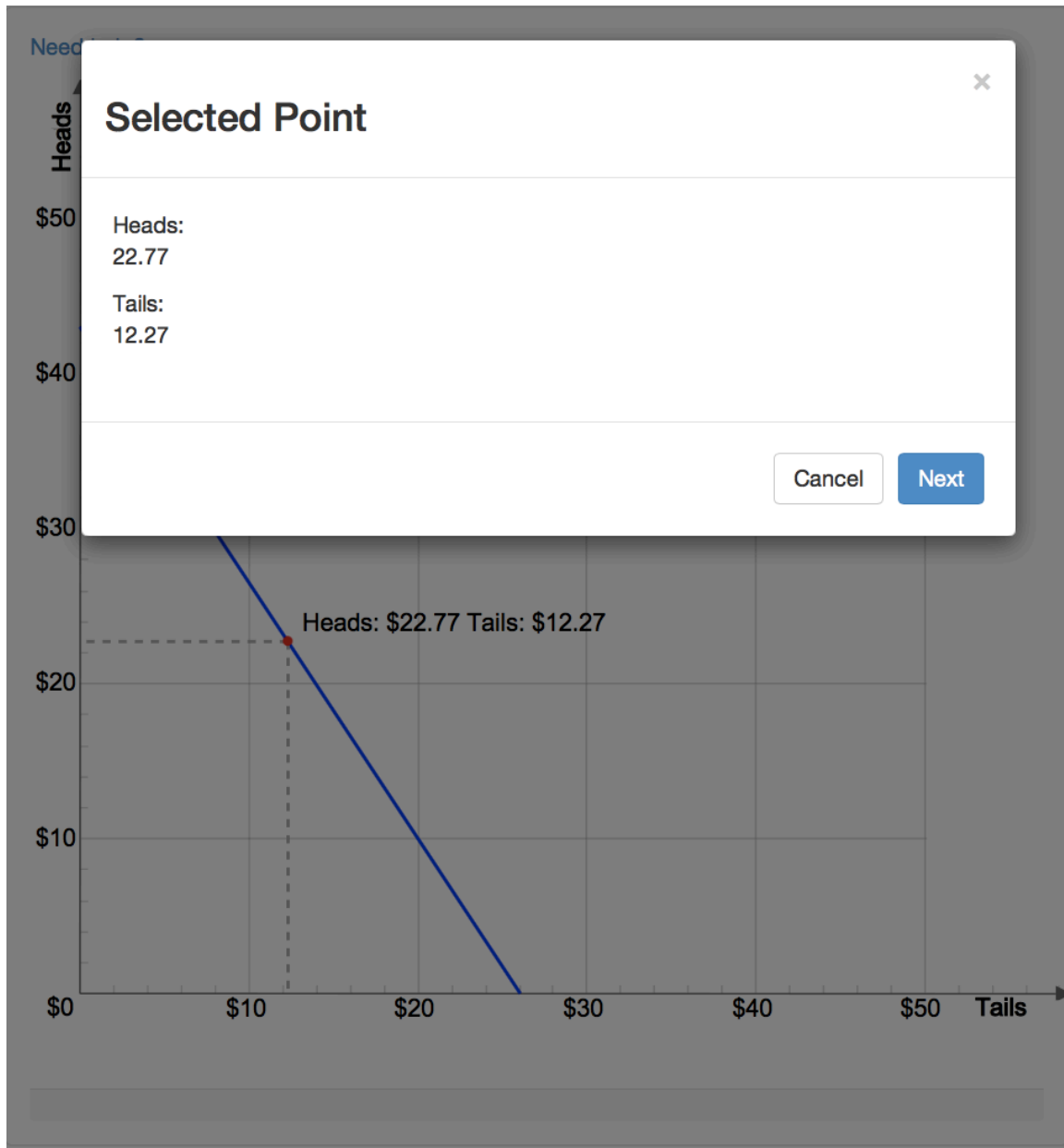
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### Risk Choice Task (Choi et al. 2014) (Study 2)

In Study 2, we measured the willingness to take risks using the risk choice task from Choi et al. (2014). In this task, subjects are asked to invest an experimental endowment in two securities whose payoffs depend on the outcome of a coin toss. In practice, subjects are asked to choose a point along a budget constraint, where the y-axis corresponds to the payoff if the coin comes up heads and the x-axis to the payoff if the coin comes up tails.



The participant could move the cursor along the budget constraint to try different allocations and get a feel for the trade-off involved. When she identified her preferred allocation, she had to click on it. A window popped up where the participant had to confirm her choice.



Participants were given detailed instructions (see Appendix K) on how to use the interface and had the opportunity to practice during two practice trials.

## Financial Circumstances (Study 2)

About how much did you **spend on everything** in the **last 7 days**? Please think about all bills such as rent, mortgage loan payments, utility and other bills, as well as all expenses such as food, clothing, transportation, entertainment and any other expenses you may have.

\$  .00

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About how much **cash** do you have in your wallet, purse, and/or pocket, elsewhere in your home, car, office, etc?

\$  .00

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Do you have any checking or savings accounts?

☐ Yes

☐ No

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Next >>

How much money do you have in these checking and savings accounts?

\$  .00

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### Purchases of Durable Goods (Study 2)

Did you purchase any of the following items in the **last 7 days**? Please check all that apply.

- ☐ Automobile or truck
- ☐ Furniture
- ☐ Refrigerator
- ☐ Stove and/or oven
- ☐ Washing machine and/or dryer
- ☐ Dishwasher
- ☐ Television
- ☐ Computer
- ☐ Tablet or smartphone
- ☐ None of the above

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## Food Consumption (Study 2)

Have you eaten any of the following foods in the **LAST 24 HOURS**?

Please check the **number of portions** consumed for every row.

	0	1	2	3	4+
<b>Fresh fruits</b> (do not count juices)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Fried potatoes</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Fresh vegetables</b> (e.g. salad, tomatoes, carrots, broccoli, green beans, onions, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Regular soda/pop</b> that contains sugar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Fast food</b> (eaten at work, at home, at fast-food restaurants, carryout or drive through)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Desserts</b> (e.g. cakes, candy, chocolate, ice cream, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Any type of meat</b> (e.g. beef/steak, pork, chicken, deli meats, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Any type of seafood</b> (e.g. fish, shrimp, crab, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Alcohol</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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## Subjective Perception of Scarcity (Study 2)

The following questions ask you about your feelings and thoughts in the **LAST 24 HOURS**. In each case, please indicate with a check how often you felt or thought a certain way.

In the **LAST 24 HOURS**, how often...


	Never	Rarely	Sometimes	Fairly Often	Very Often
...were you troubled about coping with ordinary bills?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...did you worry about having enough money to make ends meet?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...did you think about future expenses, some of which may be unexpected?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...were you preoccupied with thoughts about your personal finances?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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We are interested in understanding if people's concerns about having enough money to make ends meet change over the month. Relative to other days this month, how concerned were you in the **LAST 24 HOURS** about having less money than you need to make ends meet?

Enter your answer by clicking on a point in the scale or by dragging the blue dot.

  
Much less concerned    Less concerned    About the same    More concerned    Much more concerned

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# Appendix C.

## Socioeconomic Status

Table C1. Distribution of Annual Household Income

Annual Household Income	<i>Study 1</i>	<i>Study 2</i>
Less than \$5,000	0.0%	5.1%
Between \$5,000 and \$10,000	20.6%	10.3%
Between \$10,000 and \$15,000	13.9%	14.1%
Between \$15,000 and \$20,000	10.4%	11.5%
Between \$20,000 and \$25,000	15.7%	14.6%
Between \$25,000 and \$30,000	13.6%	14.3%
Between \$30,000 and \$35,000	14.0%	14.4%
Between \$35,000 and \$40,000	11.7%	15.9%
<i>N</i>	1,091	2,723

*Notes:* The table shows the distribution of annual household income at baseline. In Study 1 there were 7 study participants who reported their household income around the time the original sample was selected (we needed these data to restrict the sample to panel members living in households with an annual income of \$40,000 or less) but did not report their household income at the time of the baseline survey.

Table C2. Distribution of Wealth (Study 1)

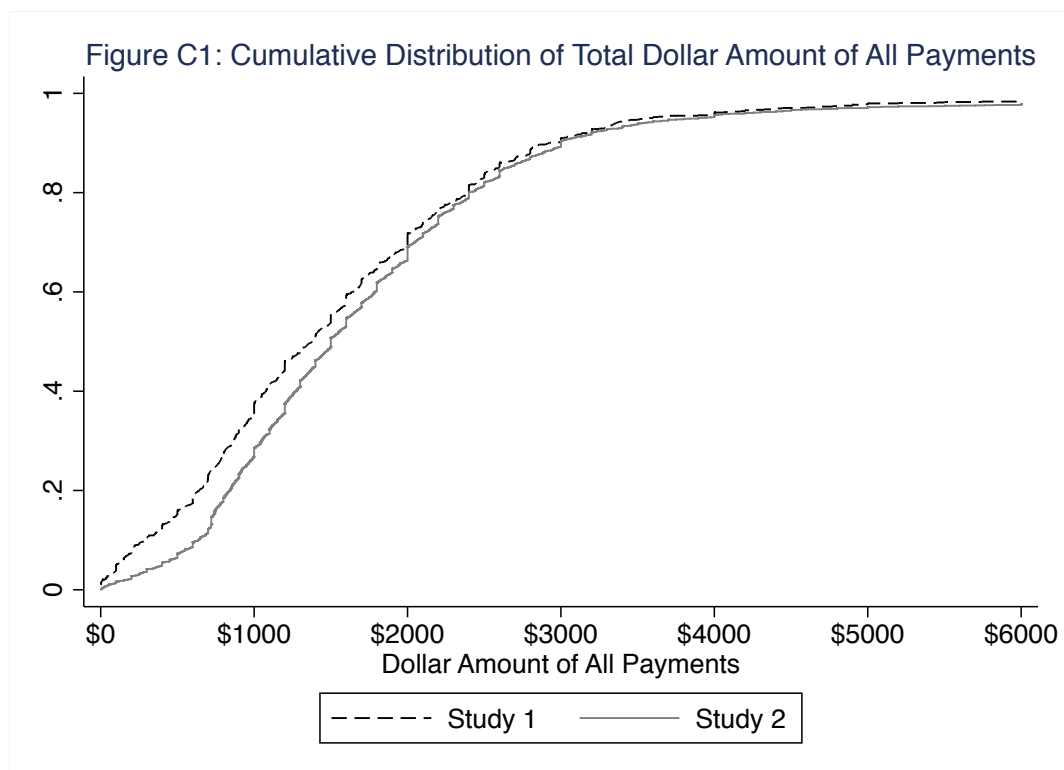
<i>Wealth Measure</i>	<i>Percentile</i>				
	10th	25th	Median	75th	90th
Net Value of Real Estate (excl. Primary Residence)	\$0	\$0	\$0	\$0	\$0
Net Value of Vehicles	\$0	\$0	\$2,000	\$8,000	\$16,000
Net Value of Business	\$0	\$0	\$0	\$0	\$0
Net Value of IRA and Keogh	\$0	\$0	\$0	\$0	\$19,000
Net Value of Stocks & Mutual Funds	\$0	\$0	\$0	\$0	\$0
Value of Checking, Savings & Money Market	\$0	\$0	\$0	\$1,500	\$11,000
Value of CD, Savings Bonds, and T-bills	\$0	\$0	\$0	\$0	\$0
Net value of Bonds and Bond Funds	\$0	\$0	\$0	\$0	\$0
Net Value of All Other Savings	\$0	\$0	\$0	\$0	\$0
Value of Other Debt	\$0	\$0	\$150	\$8,000	\$20,000
Value of Primary Residence	\$0	\$0	\$0	\$80,000	\$160,000
Value of All Mortgages (Primary Residence)	\$0	\$0	\$0	\$0	\$60,000
Value of Other Home Loans (Primary Residence)	\$0	\$0	\$0	\$0	\$0
Total Non-Housing Wealth	-\$14,925	-\$2,000	\$850	\$18,800	\$100,000
Total Housing Wealth	\$0	\$0	\$0	\$43,000	\$121,000
Total Wealth	-\$19,400	-\$1,868	\$2,300	\$59,400	\$225,000

*Notes:* The table shows selected percentiles of the wealth distribution for different wealth measures. The wealth measures were calculated using the RAND Health and Retirement Study (HRS) methodology: <http://hrsonline.isr.umich.edu/modules/meta/rand/randhrsk/randhrsk.pdf>. Various sections of the 2008 HRS Wave have been administered to ALP members through a series of ALP modules, which are known as the ALP HRS (<https://mmicdata.rand.org/alp/index.php?page=hrs>). Section Q on Income and Assets was administered on a continuous basis through ALP ms62: <https://mmicdata.rand.org/alp/index.php?page=data&p=showsurvey&syid=62>. Because ALP module ms62 continued to be administered to new panel members as they progressively joined the panel, different respondents completed it in different years: Roughly 36% completed it in 2009; 6% in 2010; 25% in 2011; and roughly a third in 2012. Total non-housing wealth is the sum of net value of real estate (excluding primary residency); plus net value of vehicles; plus net value of business; plus net value of IRA and Keogh accounts; plus net value of stocks, mutual funds and trust funds; plus value of checking, savings and money market accounts; plus value of CD, savings bonds, and T-bills; plus net value of bonds and bond funds; plus net value of all other savings; *minus* value of other debt. Total housing wealth is equal to value of primary residence; *minus* value of all mortgages (for primary residence only); *minus* value of other home loans (for primary residence only). Total wealth is equal to total non-housing wealth plus total housing wealth.  $N = 1,067$ .

Table C3. Distribution of Wealth (Study 2)

<i>Wealth Measure</i>	<i>Percentile</i>				
	10th	25th	Median	75th	90th
Assets (cash, checking & savings accounts, stocks, bonds, mutual funds, CDs, T-bills and gov't bonds)	\$0	\$100	\$1,500	\$23,000	\$140,000
Debt (credit card balances, medical debts, payday loans, student loans, and loans from relatives)	\$0	\$0	\$1,200	\$9,000	\$30,000
Wealth	-\$25,000	-\$5,000	\$0	\$17,650	\$130,000

*Notes:* The table shows selected percentiles of the wealth distribution. Wealth was measured in Study 2 using two questions: "Consider cash, checking and savings accounts, stocks, bonds, mutual funds, certificates of deposit, and T-bills and government bonds owned by members of this household. What is the total value of these assets at this time?" and "Consider credit card balances, medical debts, payday loans, student loans, and loans from relatives owed by members of this household. What is the total value of these debts at this time?"  $N = 2,677$ .



*Notes:* The figure shows the cumulative distribution of the dollar amount of all payments the respondent (and the spouse) expected to receive during the reference period. The calculation excludes participants who failed to report the dollar amount of at least one of their payments.  $N = 1,086$  (Study 1), 2,556 (Study 2).

Table C4. Financial Hardship

Over the past 12 months have any of the following happened to you because of a shortage of money?	<i>Study 1</i>	<i>Study 2</i>
Could not pay electricity, gas or phone bills	29.8%	17.7%
Could not pay for car registration or insurance	12.9%	8.6%
Pawned or sold something	18.4%	12.5%
Went without meals	14.0%	13.5%
Unable to heat home	5.1%	4.0%
Sought assistance from welfare/community organizations	14.9%	11.9%
Sought financial help from friends or family	23.8%	19.7%
Took a loan from a payday lender	8.5%	4.7%
At least one of the above	51.5%	40.3%
Overdrew any of your bank accounts	-	13.5%
<i>N</i>	1,097	2,720

*Notes:* The table shows the fraction of participants who reported having experienced financial hardship in the 12 months preceding the baseline survey.

# Appendix D.

## Payments

Table D1. Number of Payments by Source of Income (Study 1)

<i>Source of Income</i>	Number of Payments					
	0	1	2	3	4	≥ 5
Wages and Salaries	56.3%	6.8%	32.5%	3.1%	1.3%	-
Self-Employment	92.0%	4.2%	2.7%	0.6%	0.5%	-
Unemployment Compensation	97.6%	0.8%	1.4%	0.2%	0.0%	-
Social Security or Disability	58.8%	36.2%	4.5%	0.5%	0.0%	-
Public Assistance or Welfare	93.4%	5.4%	0.9%	0.1%	0.2%	-
Retirement Income	88.1%	10.0%	1.8%	0.0%	0.1%	-
Other Income	85.3%	12.8%	1.4%	0.5%	0.1%	-
All	-	38.0%	41.7%	13.8%	5.6%	0.8%

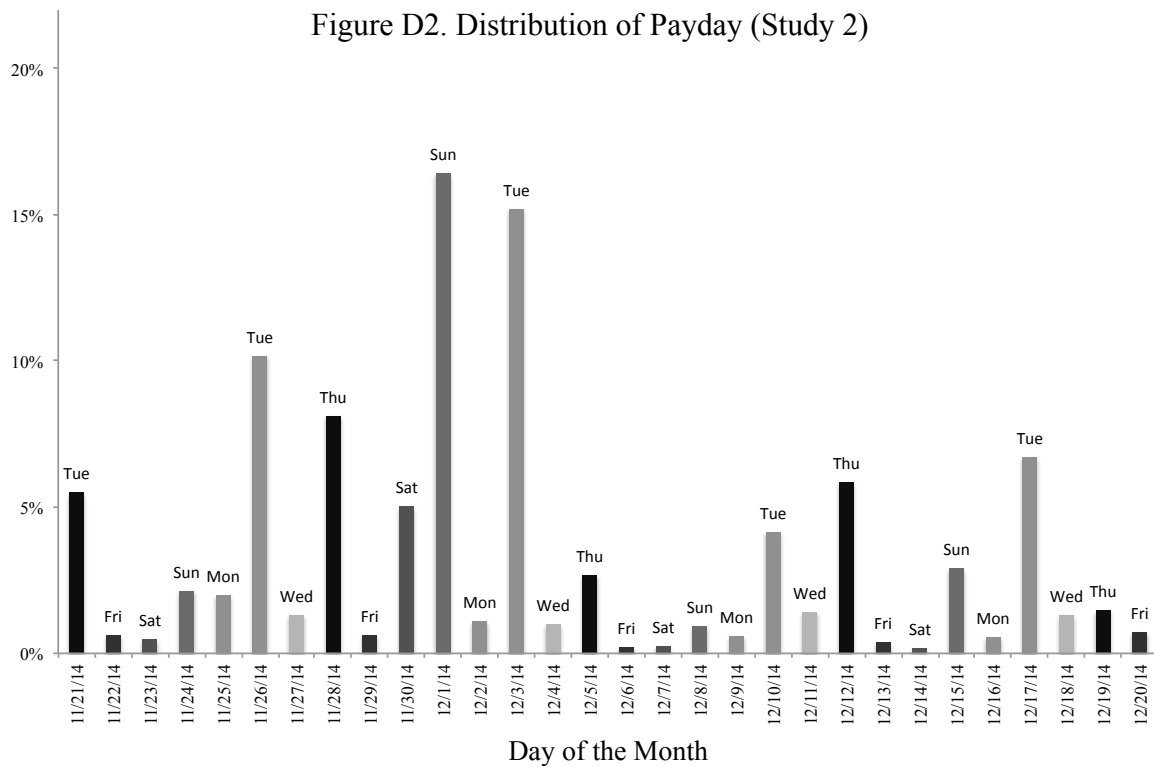
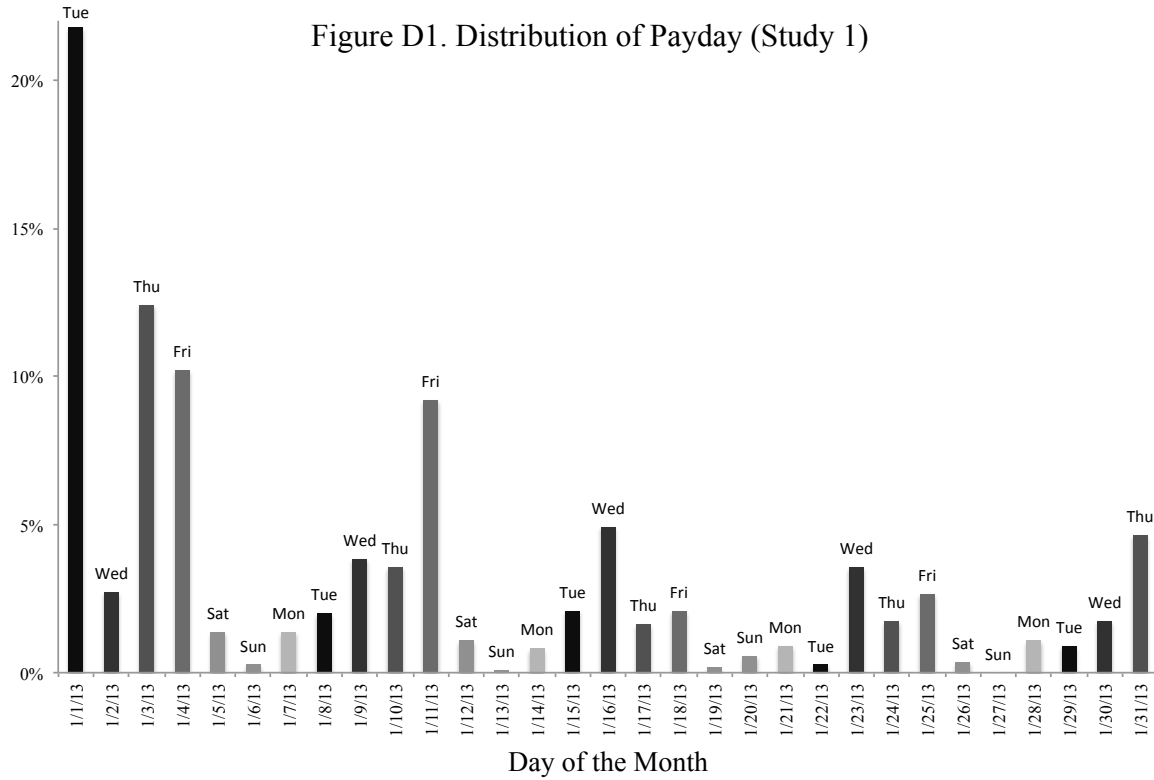
*Notes:* The table shows the distribution of the number of payments participants expected to receive in January 2013, separately by source of income.  $N = 1,098$ .

Table D2. Number of Payments by Source of Income (Study 2)

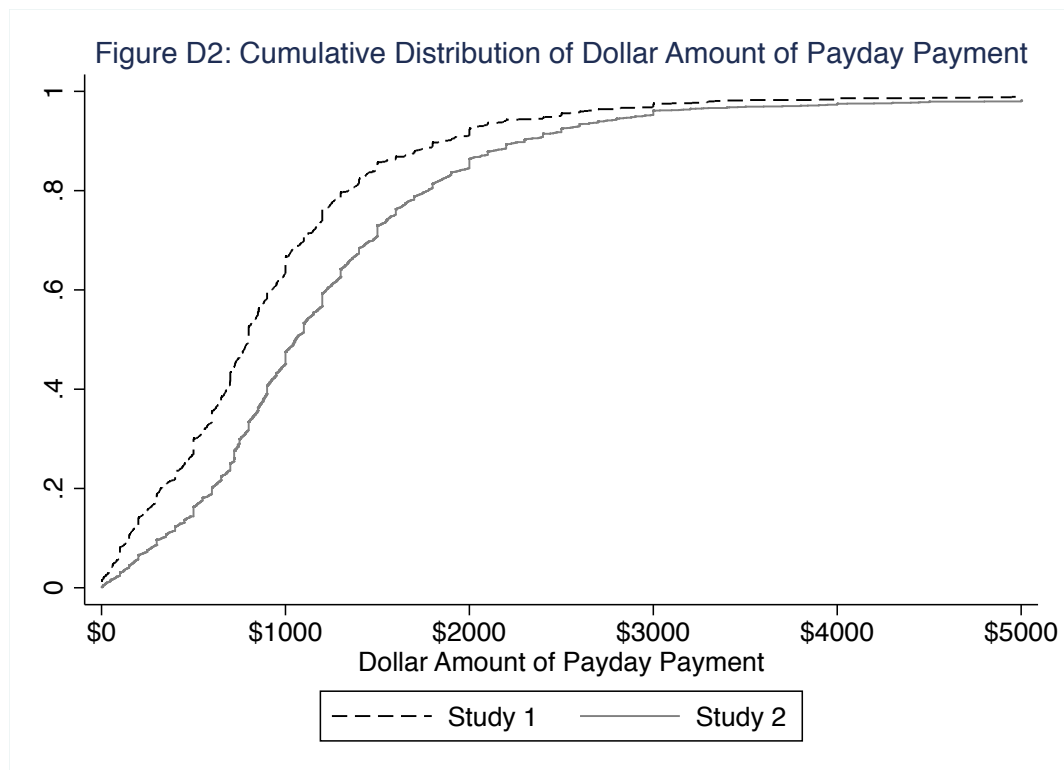
<i>Source of Income</i>	Number of Payments					
	0	1	2	3	4	≥ 5
Wages and Salaries	69.9%	6.2%	23.9%	-	-	-
Self-Employment	95.7%	2.4%	2.0%	-	-	-
Unemployment Compensation	99.7%	0.1%	0.3%	-	-	-
Social Security or Disability	41.3%	53.7%	5.1%	-	-	-
Public Assistance or Welfare	97.4%	2.3%	0.3%	-	-	-
Retirement Income	76.2%	22.2%	1.5%	-	-	-
Other Income	92.2%	6.7%	1.1%	-	-	-
All	-	42.9%	53.4%	2.8%	0.9%	0.0%

*Notes:* The table shows the distribution of the number of payments participants expected to receive between Nov 21<sup>st</sup> 2014 and Dec 20<sup>th</sup> 2014, separately by source of income.  $N = 2,797$ .

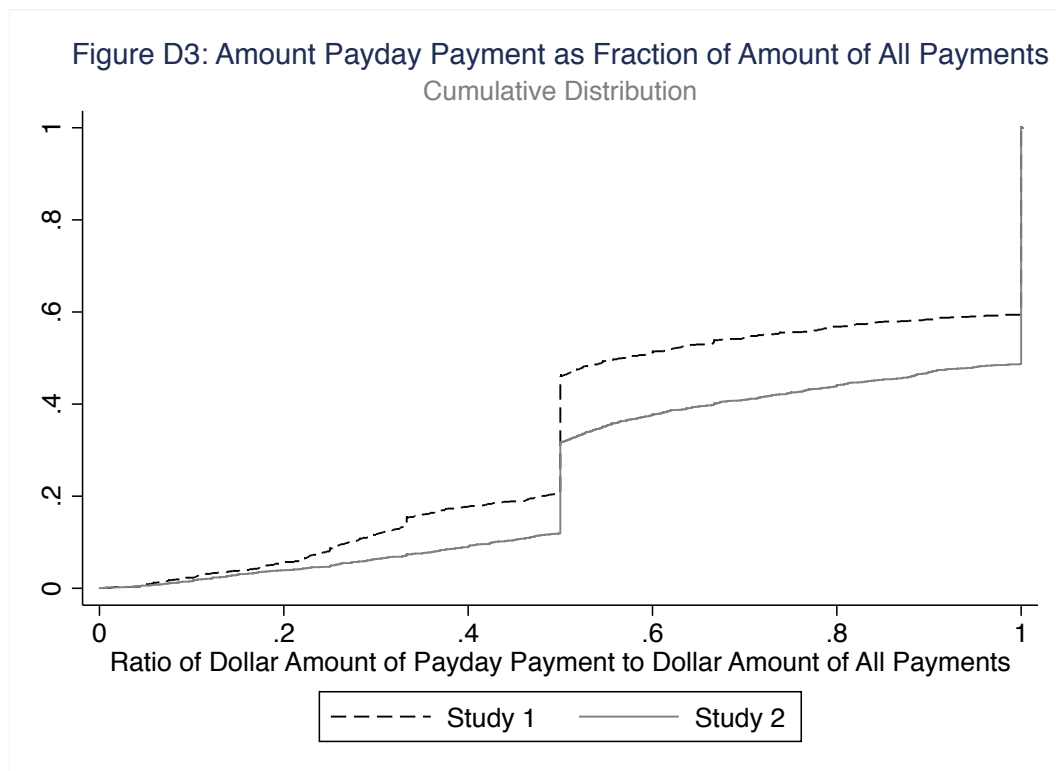




*Notes:* The figure shows the distribution of “payday” used to determine when the survey was made available to the study participant. For example payday fell on Wednesday January 16<sup>th</sup> for roughly 5% of the Study 1 sample. Approximately half of them, 2.5% of the entire sample, were assigned to the before-payday group and the follow-up survey was made available to them on Tuesday January 9<sup>th</sup> (and on Wednesday January 23<sup>rd</sup> for the other half assigned to the after-payday group).  $N = 1,098$  (Study 1), 2,723 (Study 2).



*Notes:* The figure shows the cumulative distribution of the dollar amount of the “payday payment.”  $N = 1,086$  (Study 1), 2,561 (Study 2). The calculation excludes participants who failed to report the dollar amount of at least one payment.



*Notes:* The figure shows the cumulative distribution of the dollar amount of the “payday payment” as a fraction of the total dollar amount of all payments the participant (and his/her spouse) expected to receive during the reference period.  $N = 1,086$  (Study 1), 2,556 (Study 2). The calculation excludes participants who failed to report the dollar amount of at least one payment.

Table D3. Method of Payment by Source of Income (Study 1)

<i>Source of Income</i>	<i>Method of Payment</i>				
	Check in the mail	Check in person	Direct Deposit	Cash	Other
Wages and Salaries	5.0%	25.2%	65.8%	3.5%	0.4%
Self-Employment	19.3%	29.5%	15.9%	31.8%	3.4%
Unemployment Compensation	11.5%	3.8%	69.2%	7.7%	7.7%
Social Security or Disability	6.0%	0.0%	92.9%	0.0%	1.1%
Public Assistance or Welfare	7.0%	0.0%	50.7%	5.6%	36.6%
Retirement Income	10.0%	0.0%	90.0%	0.0%	0.0%
Other Income	26.3%	10.6%	36.3%	15.6%	11.3%

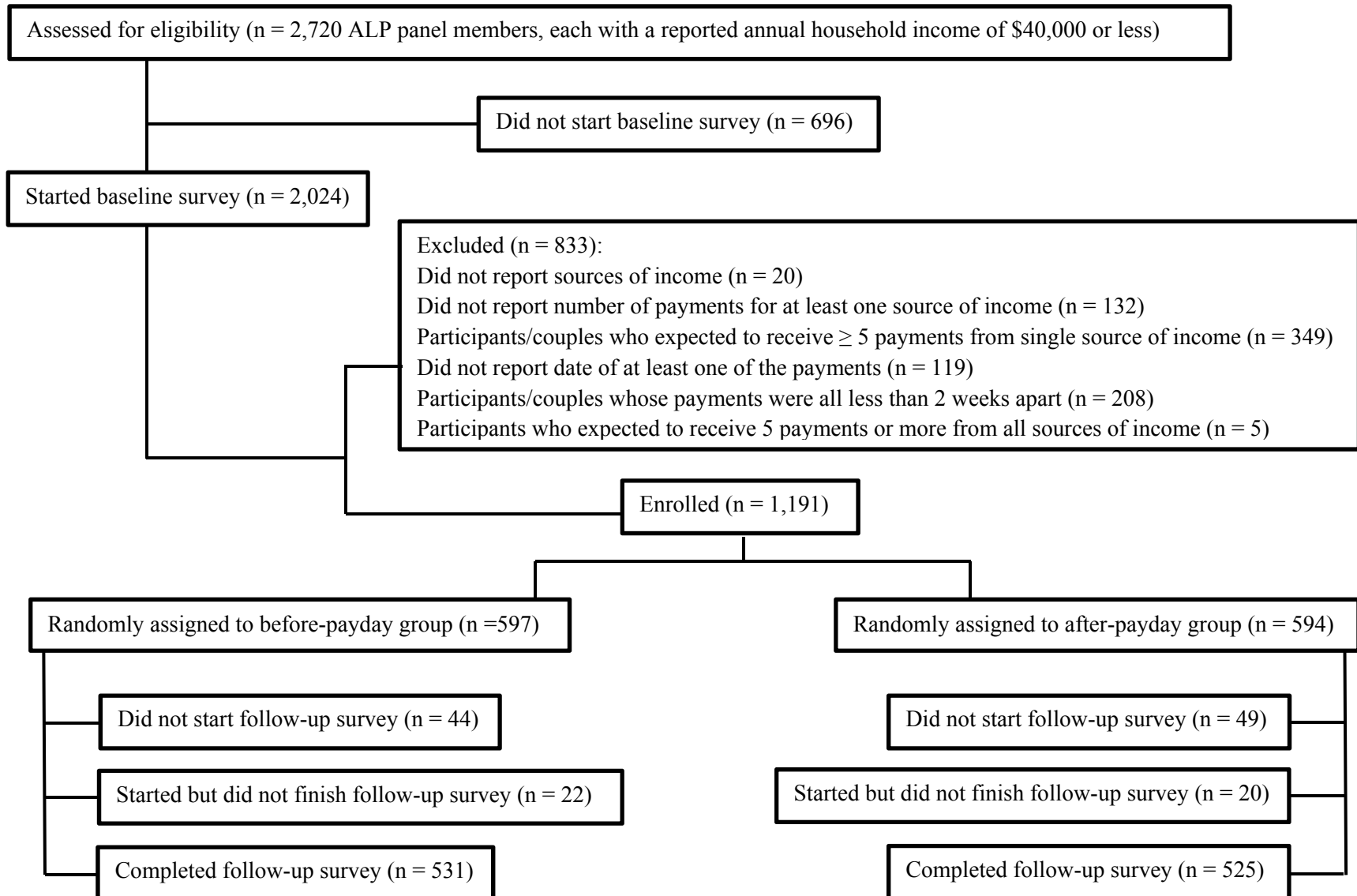
Notes: The table shows the most common methods of payments for each source of income. It reports the fraction *among those participants receiving that source of income* who received a check in the mail, who received a check in person, who were paid through direct deposit, and who were paid in cash.  $N = 480$  (wages and salaries); 88 (self-employment); 26 (unemployment compensation); 451 (social security or disability insurance); 71 (public assistance or welfare payments); 130 (retirement income); and 160 (other income). These numbers add to more than 1,098 because some participants received income from multiple sources.

Data on the method of payment were not collected in Study 2.

# Appendix E.

Sample Restrictions, Survey Nonresponse  
and Item Nonresponse

### Sample Breakdown for Study 1



## Sample Breakdown for Study 2

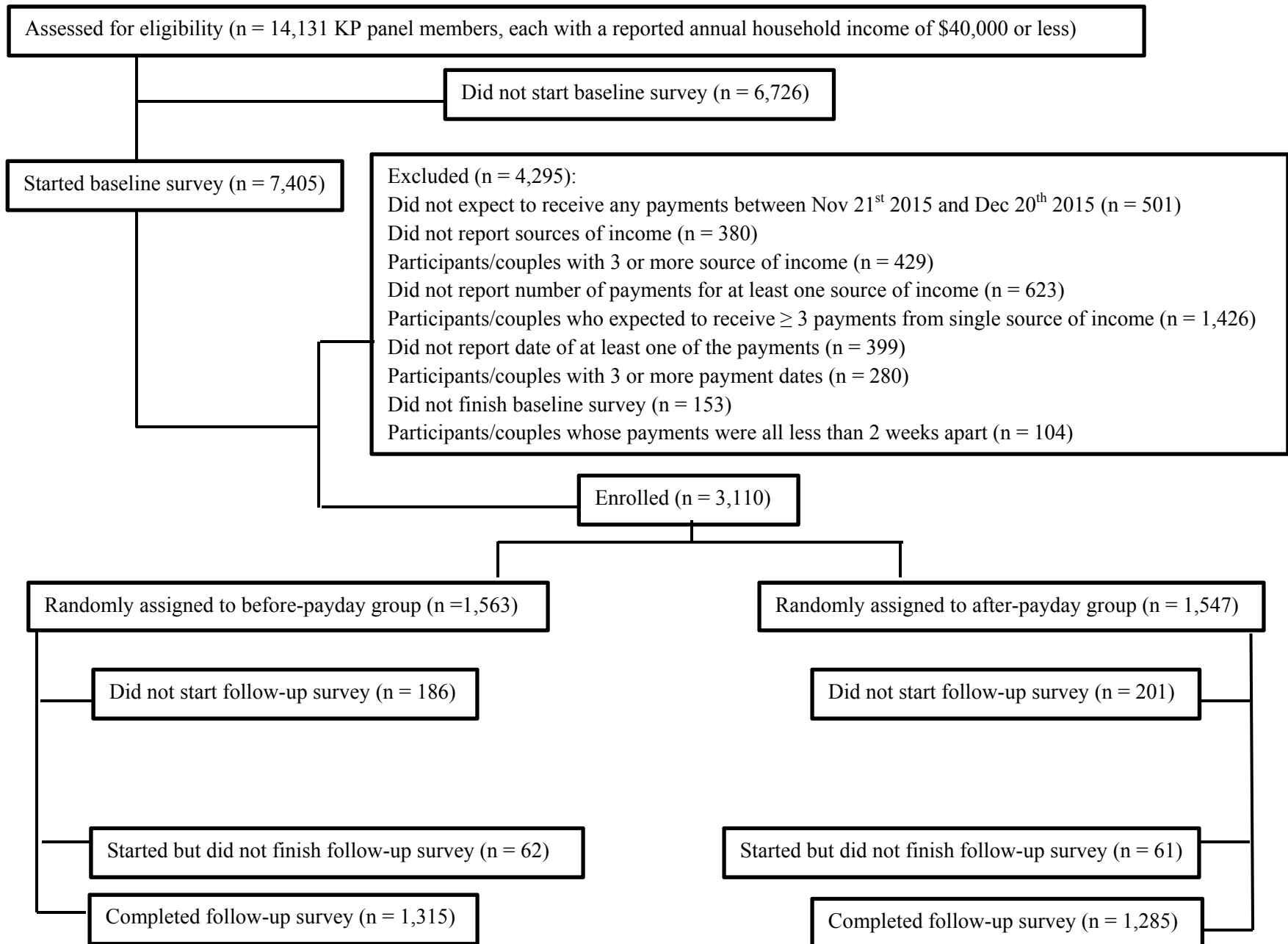


Table E1. Survey Nonresponse

	<i>{Started Follow-up}</i>		<i>{Completed Follow-up}</i>	
	Study 1	Study 2	Study 1	Study 2
{Before Payday}	0.01 [0.016]	0.01 [0.012]	0.01 [0.018]	0.01 [0.013]
Constant	0.92 [0.011]***	0.87 [0.008]***	0.88 [0.013]***	0.83 [0.009]***

*Notes:* The table investigates whether the before-payday group was more likely than the after-payday group to start or to complete the follow-up survey.  $N = 1,191$  (Study 1), 3,110 (Study 2). Robust standard errors in brackets.



Table E2. Item Nonresponse

Outcome of Interest with Missing Value	Independent Variables			
	<i>Mean for After-payday</i>	<i>{Before Payday} Coefficient</i>	P-value	
<u>Study 1</u>				
Cash	0.04	0.00	0.72	
Checking and Savings Accounts Balance	0.03	-0.01	0.24	
Expenditures	0.04	0.00	0.72	
# of Missing Choices in Monetary Intertemporal Choice Task	0.23	0.09	0.35	
# of Missing Choices in Non-Monetary Intertemporal Choice Task	0.45	0.14	0.28	
Risk Choice	0.02	0.02	0.09*	
# of Missing Choices in Loss Aversion Task	0.30	0.03	0.66	
Simplicity Seeking	0.03	0.01	0.29	
Gambler's Fallacy	0.04	0.00	0.68	
Framing	0.04	0.00	0.83	
# of Missing Trials in Flanker Task	1.22	0.11	0.59	
Simon (Working Memory)	0.06	-0.02	0.17	
Cognitive Reflection Test	0.05	0.00	0.85	
Subjective Perception of Scarcity	0.04	-0.01	0.50	
<u>Study 2</u>				
Cash	0.08	0.00	0.75	
Checking and Savings Accounts Balance	0.04	0.00	0.92	
Expenditures	0.08	0.00	0.98	
# of Missing Trials in Numerical Stroop Task	0.23	0.03	0.79	
Fewer than 25 Risk Choices	0.10	0.00	0.84	
Purchase of Durable Goods	0.00	0.00	1.00	
Food Consumption	0.04	-0.01	0.37	
Subjective Perception of Scarcity	0.02	0.00	0.82	

*Notes:* The table investigates whether – conditional on starting the survey – the before-payday group was more likely to leave a survey item unanswered than the after-payday group (that includes nonresponse because the survey was not completed). Each row corresponds to a separate regression. The dependent variable is either an indicator variable for a missing survey item or the number of missing choices/trials in a task. In Study 2 the risk choice task and the questions about purchase of durable goods, food consumption, and subjective perception of scarcity were administered to just a subsample of the overall sample. In this case we investigate nonresponse among the subsample who had been assigned to receive a given survey item. Similarly, in both studies we analyze nonresponse about the balance in the checking and savings account only among those participants who had a checking or savings account.  $N = 1,098$  (Study 1), 2,723 (Study 2).

# Appendix F.

## Randomization and Balance Check

### **Stratification and Re-randomization Procedure**

The study participants were randomized into the before-payday and after-payday groups using a stratified sample and a re-randomization procedure.

#### **Study 1**

Sixteen strata were created based on the combinations of the following four dichotomous categories: 1) whether respondent had college education; 2) whether respondent (and spouse) expected to receive one payment only during January 2013; 3) whether at baseline participant reported to strongly agree with the statement “I live from paycheck to paycheck” and 4) whether the payday was after Jan 7<sup>th</sup> 2013. Within each stratum, half of participants were assigned to the before-payday group.

The re-randomization procedure was as follows. We selected to balance the following 21 control variables across the before-payday and after-payday groups (all variables are categorical variables except for the ones with asterisks): age\*; male; working; unemployed; retired; disabled; annual household income between \$5,000 and \$10,000; annual household income between \$10,000 and \$15,000; annual household income between \$15,000 and \$20,000; annual household income between \$20,000 and \$25,000; annual household income between \$25,000 and \$30,000; annual household income between \$30,000 and \$35,000; annual household income between \$35,000 and \$40,000; whether payday payment was also largest monthly payment, number of days without payments before payday payment\*; dollar amount of payday payment\*; whether reported spouse’s payments; paid with a check in the mail; paid with a check in person; paid through direct deposit; and paid with cash.

For each one of the controls, we ran a separate regression of the control variable on the before-payday dummy, a constant, and dummies for each stratum. The randomization was re-done until the t-statistics on the before-payday dummy in all regressions (i.e., for all 21 control variables) were all smaller than 1.4 (in absolute value).

#### **Study 2**

Thirty-two strata were created based on the combinations of the following five dichotomous categories: 1) whether the respondents had an annual household income of \$20,000 or less; 2) whether respondent (and spouse) expected to receive one payment only between 11/21/2014 and 12/20/2014; 3) whether the participant was above the median in terms of his agreement with the statement “I live from paycheck to paycheck”; 4) whether participant was above the median in terms of his agreement with the statement “Money starts to run out before the next payment arrives and we are forced to cut the size of meals, skip meals, or eat more low cost foods to make ends meet”; and 5) whether the participant answered that s/he would not be able to raise \$2,000 in one week for an emergency or that s/he would have to do something drastic to raise the amount. Within each stratum, participants were sorted by a random number and assigned to one of six cells according to the proportions shown in the table below (where groups I, II, and III refer to the different surveys discussed in Appendix Section B2).

	Before-payday	After-payday
Group I	22.5%	22.5%
Group II	5%	5%
Group	22.5%	22.5%

The re-randomization procedure was as follows. We selected to balance the following 28 control variables across the before-payday and after-payday groups (all variables are categorical variables except for the ones with asterisks): age\*; male; working; self-employed; temporarily laid off; unemployed; retired; disabled; other employment status; less than high school degree; high school graduate; some college; college graduate; annual household income below \$5,000; annual household income between \$5,000 and \$10,000; annual household income between \$5,000 and \$10,000; annual household income between \$10,000 and \$15,000; annual household income between \$15,000 and \$20,000; annual household income between \$20,000 and \$25,000; annual household income between \$25,000 and \$30,000; annual household income between \$30,000 and \$35,000; annual household income between \$35,000 and \$40,000; number of household members ages 0-1\*; number of household members ages 2-5\*; number of household members ages 6-12\*; number of household members ages 13-17\*; number of household members ages 18 and over\*; date of payday payment\*; and whether reported spouse's payments.

For each one of the controls, we ran a separate regression of the control variable on the before-payday dummy, a constant, and dummies for each stratum. The randomization was re-done until the t-statistics on the before-payday dummy in all regressions (i.e., for all 28 control variables) were all smaller than 1.4 (in absolute value).

## Balance Check

The table below investigates whether control variables – some of which were used in the re-randomization procedure and others that were not – were balanced across the before-payday and after-payday groups.

Table F1. Summary Statistics and Balance Check

<b>Dependent Variable</b>	<b>Independent Variables</b>					
	<i>Mean for</i> <i>After-payday</i>		<i>Coefficient on</i> <i>{Before Payday}</i>		<i>P-value on</i> <i>{Before Payday}</i>	
	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2
<u><i>Individual Characteristics</i></u>						
Age	49.0	56.3	-0.6	-0.4	0.55	0.59
Male	0.34	0.33	-0.01	0.00	0.77	0.85
White	0.70	0.74	-0.01	0.02	0.65	0.22
Black	0.15	0.12	0.03	-0.02	0.15	0.07*
Hispanic	0.25	0.09	-0.03	-0.01	0.18	0.42
<u><i>Family Characteristics</i></u>						
Married	0.39	0.33	-0.02	0.02	0.42	0.27
Divorced	0.24	0.28	0.04	0.00	0.17	0.78
Widowed	0.08	0.14	0.00	0.00	0.77	0.71
Household Size	2.3	1.9	0.0	0.0	0.99	0.87
<u><i>Employment Status</i></u>						
Working	0.37	0.24	0.03	0.01	0.37	0.47
Unemployed	0.18	0.06	-0.02	-0.01	0.42	0.38
Retired	0.23	0.40	0.00	-0.01	0.97	0.61
Disabled	0.20	0.19	-0.03	0.02	0.27	0.31
<u><i>Education</i></u>						
College Graduate	0.33	0.28	-0.04	-0.02	0.11	0.31
Some College	0.29	0.42	0.04	-0.01	0.18	0.76
High School Graduate	0.25	0.24	0.01	0.01	0.58	0.37
<u><i>Annual Household Income</i></u>						
Less than \$5,000	-	0.05	-	0.00	-	0.97
Between \$5,000 and \$10,000	0.19	0.10	0.03	0.01	0.25	0.38
Between \$10,000 and \$15,000	0.15	0.13	-0.03	0.02	0.19	0.23
Between \$15,000 and \$20,000	0.09	0.12	0.02	-0.02	0.27	0.16
Between \$20,000 and \$25,000	0.16	0.14	0.00	0.00	0.98	0.89
Between \$25,000 and \$30,000	0.14	0.14	-0.02	0.00	0.42	0.81
Between \$30,000 and \$35,000	0.13	0.14	0.03	0.00	0.23	0.85
Between \$35,000 and \$40,000	0.13	0.16	-0.03	-0.01	0.16	0.72

*Notes:* Columns (1)-(2) show means for the after-payday group. Columns (3)-(4) show differences in means between the before-payday and after-payday groups. The last two columns report p-values of tests that the differences in means are equal to zero. The sample is restricted to participants who started the follow-up survey.  $N = 1,191$  (Study 1), 2,723 (Study 2). The p-value of a hypothesis test that the variables listed in the rows jointly predict assignment into the before-payday group is 0.63 (Study 1), 0.67 (Study 2).

# Appendix G1.

## Additional Results (Study 1)

Table G1. Choices in Loss Aversion Task

<i>Dependent Variable: 1 if Chose 50-50 Gamble of Winning \$6 or Losing X</i>						
	<i>X = Dollar Amount of Loss</i>					
	\$2	\$3	\$4	\$5	\$6	\$7
{Before Payday}	-0.02 [0.024]	0.03 [0.029]	-0.01 [0.031]	0.05 [0.030]*	0.02 [0.030]	0.02 [0.028]
Constant	0.82 [0.017]***	0.65 [0.021]***	0.46 [0.022]***	0.35 [0.021]***	0.36 [0.021]***	0.27 [0.020]***

*Notes:* The table reports choices from a loss aversion task in which subjects had to make 6 similar decisions. In each decision they had to choose between \$0 and a 50-50 gamble of winning \$6 or losing \$X, where X was gradually increased from \$2 to \$7. Each column corresponds to a separate regression in which the dependent variable is equal to 1 if the subject chose the gamble when the potential loss, i.e., X, was equal to the dollar amount listed in the column.  $N = 1,038$ . Robust standard errors.

Table G2. Simplicity Seeking

<i>Independent Variables</i>	<i>Dependent Variable</i> {All-or-nothing Gamble}
{Before Payday} * {11 Options}	0.01 [0.054]
{Before Payday}	0.00 [0.040]
{11 Options}	-0.12 [0.038]***
Constant	0.32 [0.029]***

*Notes:* Participants were randomly assigned to choose either among 11 lotteries or among 3 lotteries. The payoff of each lottery depended on the roll of a dice. Both choice sets included an all-or-nothing gamble that paid \$0 if the dice landed on 1, 2 or 3, and \$10 otherwise. The task was designed to identify whether subjects are more likely to choose the all-or-nothing gamble when they have to choose among a larger number of options (Iyengar and Kamenica 2010).  $N = 1,057$ . Robust standard errors.

Table G3. Gambler's Fallacy

<i>Independent Variables</i>	<i>Dependent Variable</i> {Belief in Gambler's Fallacy}
{Before Payday}	0.00 [0.027]
Constant	0.73 [0.019]***

*Notes:* Participants were asked the following question from Toplak et al. 2011: "When playing slot machines, people win something about 1 in every 10 times. Julie, however, has just won on her first three plays. What are her chances of winning the next time she plays? \_\_\_\_ out of \_\_\_\_." Participants were classified as believing in the gambler's fallacy unless they answered "1 out of 10" (or 10 out of 100, etc.).  $N = 1,053$ . Robust standard errors.

Table G4. Framing  
Disease Problem (Kahneman and Tversky 1981)

<i>Independent Variables</i>	<i>Dependent Variable</i> {Choice of Program B}
{Before Payday} * {Negative Frame}	-0.02 [0.057]
{Before Payday}	-0.04 [0.039]
{Negative Frame}	0.37 [0.041]***
Constant	0.29 [0.028]***

*Notes:* Susceptibility to framing was measured using the "disease problem" (Kahneman and Tversky 1981) in which two policy options are either framed in terms of number of lives saved or the number of lives lost.  $N = 1,059$ . Robust standard errors.



# Appendix G2.

## Additional Results (Study 2)

Table G5. Purchase of Durable Goods (Study 2)

<b>Dependent Variable</b>	<b>Independent Variables</b>		
	<i>Mean for After-Payday</i>	<i>{Before Payday} Coefficient</i>	<i>P-value</i>
<i>Did you or your household purchase any of the following items in the last 7 days?</i>			
<u>Multivariate Regression</u>			
Automobile or Truck	0.015	-0.013	0.01
Furniture	0.010	0.003	0.59
Refrigerator	0.000	0.003	0.16
Stove and/or Oven	0.007	-0.005	0.18
Washing Machine and/or Dryer	0.003	0.002	0.66
Dishwasher	0.002	-0.002	0.32
Television	0.025	-0.021	0.00
Computer	0.010	0.000	1.00
Tablet or Smartphone	0.033	-0.002	0.87
Joint Test			0.01
<u>Univariate Regression</u>			
One or more of the items listed above	0.084	-0.028	0.06

*Notes:* The table examines if the after-payday group was more likely to purchase durable goods than the after-payday group. It reports the results from a multivariate regression where the dependent variables listed on the row are jointly regressed on the before-payday dummy and a constant.  $N = 1,213$ .

Table G6. Total Expenditures Excluding Respondents who Purchased Durable Goods (Study 2)

	<i>Total Expenditures</i>			
	OLS	Median	OLS	Median
	<i>All</i>		<i>Excluding respondents who purchased durable goods</i>	
{Before Payday}	-\$1,250 [716]*	-\$300 [38]***	-\$1,298 [775]*	-\$300 [37]***
Constant	\$1,868 [715]***	\$600 [27]***	\$1,899 [774]**	\$600 [26]***
P-value Wilcoxon	0.00		0.00	
<i>N Observations</i>	1,176	1,176	1,096	1,096

*Notes:* The table examines if the before-after differences in the purchase of durable goods can explain the before-after differences in total expenditures. The last two columns exclude from the sample respondents who had purchased durable goods. The sample is restricted to participants who received the questions about purchase of durable goods (about 45% of the sample).

Table G7. Food Consumption (Study 2)

	<i>Fresh Fruits</i>	<i>Fried Potatoes</i>	<i>Fresh Vegetables</i>	<i>Soda</i>	<i>Fast Food</i>
{Before Payday}	-0.07 [0.068]	0.01 [0.042]	-0.04 [0.069]	0.06 [0.062]	0.01 [0.045]
Constant	1.17 [0.049]***	0.35 [0.029]***	1.46 [0.048]***	0.64 [0.043]***	0.41 [0.031]***
<i>N Observations</i>	1,190	1,186	1,198	1,190	1,195

	<i>Desserts</i>	<i>Meat</i>	<i>Seafood</i>	<i>Alcohol</i>
{Before Payday}	0.00 [0.060]	-0.05 [0.062]	-0.01 [0.039]	-0.05 [0.053]
Constant	1.19 [0.042]***	1.58 [0.044]***	0.32 [0.027]***	0.43 [0.040]***
<i>N Observations</i>	1,195	1,196	1,195	1,193

*Notes:* The table examines if there are differences in the food consumption of the before-payday and after-payday groups. The dependent variable is the number of portions the participant consumed in the previous 24 hours of the items listed on the columns. Robust standard errors in brackets.

Table G8. Subjective Perception of Scarcity

	<i>Mean for After-Payday</i>	<i>{Before Payday} Coefficient</i>	<i>S.E.</i>
<b>Study 1 (N = 1,056)</b>			
<i>How hard will it be to cover expenses you expect to have in the next 5 days?</i>	2.94	-0.06	0.090
<i>How hard would it be for you to raise \$2,000 in a week for an emergency?</i>	2.80	0.05	0.068
<i>How satisfied are you with the current financial situation of your household?</i>	2.41	0.06	0.068
<i>How stressed do you feel about your personal finances?</i>	3.33	-0.10	0.075
P-value Joint Test		0.39	
<b>Study 2 (N = 1,158)</b>			
<i>In the last 24 hours, how often...</i>			
<i>...were you troubled about coping with ordinary bills?</i>	2.45	0.09	0.076
<i>...did you worry about having enough money to make ends meet?</i>	2.62	0.20	0.080**
<i>...did you think about future expenses, some of which may be unexpected?</i>	3.03	0.07	0.074
<i>...were you preoccupied with thoughts about your personal finances?</i>	2.66	0.14	0.075*
<i>Relative to other days this month, how concerned were you in the last 24 hours about having less money than you need to make ends meet?</i>	0.52	0.01	0.013
P-value Joint Test		0.07	

*Notes:* The table investigates before-after payday differences in the subjective perception of scarcity. It reports results from multivariate regressions where the dependent variables listed on the rows are jointly regressed on the before-payday dummy and a constant. The top panel shows results for measures collected in Study 1. The bottom panel shows results for measures collected in Study 2. With the exception of the question “How hard would it be pay for you to raise \$2,000 in a week for an emergency?”, participants answered Study 1’s questions by choosing a number in a 1 to 5 scale. The possible answers to the question “How hard would it be pay for you to raise \$2,000 in a week for an emergency?” were: “I could easily raise the money”; “I could raise the money, but it would involve some sacrifices”; “I would have to do something drastic to raise the money”; and “I don’t think I could raise the money.” With the exception of the question “Relative to other days this month, how concerned were you...”, participants answered Study 2’s questions by choosing among the options “Never”; “Rarely”; “Sometimes”; “Fairly Often”; and “Very Often”, which were converted to a 1 to 5 scale. Participants answered the question “Relative to other days this month, how concerned were you...” by choosing a point along a continuous scale, which was normalized to range from 0 to 1. We obtain similar results if we estimate ordered probit models.

# Appendix H.

## More Strained Subgroups

Table H1. Intertemporal Choices about Money

Independent Variables	Dependent Variable: <i>\$ Amount Sooner Reward</i>			
	Subgroup			
	<i>One Payment</i>	<i>Financial Hardship</i>	<i>Paycheck to Paycheck</i>	<i>Income ≤ \$20,000</i>
{Before Payday} * {Immediate Rewards}	10.26 [6.081]*	11.30 [5.186]**	12.78 [5.297]**	12.31 [6.029]**
{Before Payday} * Interest rate	6.34 [4.998]	4.09 [4.194]	3.90 [4.007]	-0.07 [4.422]
{Before Payday} * Delay Time	-0.24 [1.687]	-1.28 [1.453]	-0.72 [1.373]	0.55 [1.591]
{Before Payday}	-19.92 [15.638]	-2.47 [13.673]	-8.03 [13.222]	-27.83 [14.721]*
{Immediate Rewards}	-4.45 [4.644]	-4.75 [3.597]	-4.42 [4.055]	-5.50 [4.442]
Interest rate	-44.08 [3.677]***	-42.10 [3.058]***	-39.87 [2.944]***	-33.55 [3.182]***
Delay Time	-0.85 [1.106]	-1.01 [0.956]	-0.88 [0.918]	-2.59 [1.060]**
Constant	[10.839]***	[9.343]***	[9.122]***	[10.109]***
<i>N Observations</i>	5,100	6,588	6,732	5,652

*Notes:* This table reports results from an OLS regression where the dependent variable is the dollar amount of the sooner payment. “Immediate Rewards” is an indicator variable that is 1 if the mailing date of the sooner payment is today. “Delay Time” is the time interval between the sooner and later payments. The sample is restricted to subjects who made all 12 choices in the task with monetary rewards. Standard errors clustered at the individual level in brackets.

Table H2. Intertemporal Choices about Real Effort

<i>Independent Variables</i>	<i>Dependent Variable: Monthly Discount Rate</i>			
	<b>Subgroup</b>			
	<i>One Payment</i>	<i>Financial Hardship</i>	<i>Paycheck to Paycheck</i>	<i>Income ≤ \$20,000</i>
{Before Payday} * {Immediate Task}	-0.04 [0.040]	-0.04 [0.032]	-0.05 [0.035]	-0.04 [0.037]
{Before Payday}	0.04 [0.045]	0.02 [0.035]	0.04 [0.039]	0.05 [0.040]
{Immediate Task}	0.09 [0.027]***	0.09 [0.023]***	0.09 [0.025]***	0.08 [0.026]***
Constant	0.30 [0.031]***	0.28 [0.024]***	0.31 [0.027]***	0.28 [0.027]***
<i>N Observations</i>	810	1,060	1,076	900

*Notes:* This table reports estimates from interval regressions where the dependent variable is the interval measure of the individual discount rate (IDR). Two IDRs are estimated for each subject; one for each time frame. “Immediate Task” is an indicator variable for the “5 days (sooner) x 35 days (later)” time frame. Standard errors clustered at the individual level in brackets. The sample is restricted to subjects who made all 10 choices in the task with non-monetary rewards.



Table H3. Risk Choices

	Subgroup					
	One Payment	Financial Hardship	Paycheck to Paycheck	Income $\leq$ \$20,000	Caloric Crunch	Liquidity Constrained
<i>CRRRA Parameter (Study 1)</i>						
{Before Payday}	-0.14 [0.236]	0.00 [0.206]	0.05 [0.208]	-0.18 [0.232]	-	-
Constant	1.62 [0.176]***	1.53 [0.146]***	1.49 [0.148]***	1.65 [0.169]***	-	-
<i>N Observations</i>	432	549	563	476	-	-
<i>% Allocated to Cheapest Asset (Study 2)</i>						
{Before Payday}	0.00 [0.010]	0.00 [0.011]	-0.01 [0.010]	-0.01 [0.011]	0.00 [0.010]	0.00 [0.009]
Constant	0.61 [0.007]***	0.61 [0.008]***	0.61 [0.007]***	0.61 [0.007]***	0.61 [0.007]***	0.61 [0.007]***
<i>N Observations</i>	580	459	535	456	532	569

*Notes:* The first panel reports estimates from an interval regression where the dependent variable is the interval measure of the coefficient of relative risk aversion. The bottom panel reports results from an OLS regression where the dependent variable is the fraction allocated to the cheapest asset (Choi et al. 2014 propose this as a nonparametric measure of risk attitudes that does not require assumptions about the parametric form of the underlying utility function). Robust standard errors in brackets.

Table H4. Quality of Decision-Making

	Subgroup					
	One Payment	Financial Hardship	Paycheck to Paycheck	Income $\leq$ \$20,000	Caloric Crunch	Liquidity Constrained
Dependent Variable: <i>{Increased Later \$ Reward in Response to Interest Raise}</i> (Study 1)						
{Before Payday}	-0.03 [0.020]	-0.02 [0.018]	0.00 [0.017]	-0.01 [0.020]	-	-
Constant	0.84 [0.021]***	0.83 [0.019]***	0.82 [0.019]***	0.79 [0.022]***	-	-
<i>N Observations</i>	3,825	4,941	5,049	4,239	-	-
Dependent Variable: <i>{at Most One Switching Point}</i> (Study 1)						
{Before Payday}	-0.02 [0.029]	-0.01 [0.025]	-0.02 [0.025]	-0.02 [0.030]	-	-
Constant	0.88 [0.020]***	0.88 [0.018]***	0.88 [0.018]***	0.85 [0.022]***	-	-
<i>N Observations</i>	810	1,060	1,076	900	-	-
Dependent Variable: <i>CCEI Score - Violations of GARP</i> (Study 2)						
{Before Payday}	-0.02 [0.013]*	0.00 [0.014]	0.00 [0.014]	-0.03 [0.015]*	-0.02 [0.014]	0.01 [0.013]
Constant	0.85 [0.009]***	0.85 [0.010]***	0.84 [0.010]***	0.85 [0.010]***	0.85 [0.010]***	0.83 [0.010]***
<i>N Observations</i>	580	459	535	456	532	569
Dependent Variable: <i>CCEI Score - Violations of GARP &amp; FOSD</i> (Study 2)						
{Before Payday}	-0.03 [0.019]	0.00 [0.020]	0.00 [0.019]	-0.02 [0.021]	-0.04 [0.019]**	0.02 [0.018]
Constant	0.72 [0.013]***	0.72 [0.015]***	0.72 [0.013]***	0.72 [0.014]***	0.73 [0.013]***	0.70 [0.013]***
<i>N Observations</i>	580	459	535	456	532	569

*Notes:* The first two panels report results from OLS regressions where the dependent variable is a measure of consistency in intertemporal choices. In the first panel, which investigates consistency in intertemporal choices about monetary rewards, the dependent variable is the fraction of times in which the subject increased (or kept constant) the later reward in response to an increase in the experimental interest rate (Gine et al. 2013). In the second panel, which investigates consistency in intertemporal choices about real effort, the dependent variable is 1 if the participant had at most one switching point for each time frame (Burks et al. 2009). The last two panels report results from OLS regressions where the dependent variable is a measure of consistency in risk choices. In the third panel, which investigates violations of the General Axiom of Revealed Preference, the dependent variable is Afriat's Critical Cost Efficiency Index (CCEI). The last panel examines a unified measure of GARP violations and violations of stochastic dominance by combining the actual data from Study 2's risk choice task and the mirror image of these data (see Choi et al. 2014 for more details). Robust standard errors in brackets.

Table H5. Flanker and Numerical Stroop

	Subgroup					
	One Payment	Financial Hardship	Paycheck to Paycheck	Income $\leq$ \$20,000	Caloric Crunch	Liquidity Constrained
Dependent Variable: $\ln(\text{Time})$ in <i>Flanker</i> (Study 1)						
{Before Payday}	0.01 [0.044]	0.02 [0.040]	0.03 [0.039]	0.04 [0.045]	-	-
Constant	8.12 [0.046]***	8.06 [0.043]***	8.09 [0.041]***	8.10 [0.047]***	-	-
<i>N Observations</i>	8,225	10,473	10,748	9,028	-	-
Dependent Variable: $\ln(\text{Time})$ in <i>Numerical Stroop</i> (Study 2)						
{Before Payday}	-0.01 [0.015]	-0.01 [0.017]	-0.02 [0.015]	0.00 [0.018]	-0.01 [0.015]	-0.02 [0.016]
Constant	7.84 [0.015]***	7.76 [0.016]***	7.77 [0.015]***	7.82 [0.017]***	7.79 [0.015]***	7.79 [0.015]***
<i>N Observations</i>	67,132	52,321	62,276	53,225	60,410	65,244
Dependent Variable: {Correct} in <i>Flanker</i> (Study 1)						
{Before Payday}	-0.01 [0.017]	0.01 [0.014]	0.00 [0.014]	0.01 [0.016]	-	-
Constant	0.87 [0.019]***	0.86 [0.017]***	0.86 [0.017]***	0.85 [0.019]***	-	-
<i>N Observations</i>	8,225	10,473	10,748	9,028	-	-
Dependent Variable: {Correct} in <i>Numerical Stroop</i> (Study 2)						
{Before Payday}	0.00 [0.014]	0.00 [0.014]	0.01 [0.013]	-0.01 [0.016]	0.01 [0.014]	0.01 [0.013]
Constant	0.76 [0.013]***	0.81 [0.014]***	0.80 [0.013]***	0.76 [0.015]***	0.79 [0.014]***	0.79 [0.013]***
<i>N Observations</i>	67,132	52,321	62,276	53,225	60,410	65,244

Notes: See Section I.C for a description of the Flanker and Numerical Stroop. This table reports results from OLS regressions of the dependent variables shown in the column headings on an indicator variable for the before-payday group and a constant (the regressions also include trial-specific dummies). Response time in the Flanker and Numerical Stroop tasks were measured in milliseconds. The standard errors in brackets are clustered at the individual level.

Table H6. Working Memory and Cognitive Reflection Test

	Subgroup			
	One Payment	Financial Hardship	Paycheck to Paycheck	Income $\leq$ \$20,000
Dependent Variable: <i>Memory Span in Working Memory Task</i> (Study 1)				
{Before Payday}	0.21	0.30	-0.07	0.13
	[0.406]	[0.322]	[0.326]	[0.325]
Constant	4.40	4.85	4.86	4.43
	[0.253]***	[0.224]***	[0.240]***	[0.248]***
<i>N Observations</i>	416	532	549	459
Dependent Variable: <i>Score in Cognitive Reflection Test</i> (Study 1)				
{Before Payday}	0.02	0.02	0.01	0.01
	[0.022]	[0.018]	[0.017]	[0.019]
Constant	0.10	0.09	0.09	0.08
	[0.015]***	[0.012]***	[0.012]***	[0.013]***
<i>N Observations</i>	422	544	552	466

Notes: See Section I.C for a description of the working memory task and the cognitive reflection test. This table reports results from OLS regressions of the dependent variables shown in the column headings on an indicator variable for the before-payday group and a constant. Robust standard errors in brackets.

Table H7. Subjective Perception of Scarcity

	Subgroup					
	One Payment	Financial Hardship	Paycheck to Paycheck	Income ≤ \$20,000	Caloric Crunch	Liquidity Constrained
<i>In the last 24 hours, how often were you troubled about coping with ordinary bills?</i>						
{Before Payday}	0.07	0.13	0.10	0.19	0.14	0.18
	[0.109]	[0.118]	[0.109]	[0.120]	[0.108]	[0.109]*
Mean for After-payday	2.56	3.11	2.99	2.50	3.04	2.88
<i>In the last 24 hours, how often did you worry about having enough money to make ends meet?</i>						
{Before Payday}	0.15	0.28	0.18	0.35	0.26	0.28
	[0.114]	[0.113]**	[0.109]	[0.126]***	[0.105]**	[0.107]***
Mean for After-payday	2.80	3.39	3.29	2.80	3.34	3.23
<i>In the last 24 hours, how often did you think about future expenses, some of which may be unexpected?</i>						
{Before Payday}	0.02	0.14	0.05	0.05	0.08	0.12
	[0.105]	[0.106]	[0.103]	[0.115]	[0.102]	[0.104]
Mean for After-payday	3.11	3.57	3.51	3.19	3.52	3.43
<i>In the last 24 hours, how often were you preoccupied with thoughts about your personal finances?</i>						
{Before Payday}	0.12	0.20	0.14	0.18	0.20	0.23
	[0.105]	[0.111]*	[0.106]	[0.120]	[0.106]*	[0.107]**
Mean for After-payday	2.75	3.29	3.17	2.81	3.19	3.10
<i>Relative to other days this month, how concerned were you in the last 24 hours about having less money than you need to make ends meet?</i>						
{Before Payday}	0.00	0.02	0.02	0.02	0.03	0.02
	[0.018]	[0.019]	[0.018]	[0.020]	[0.018]	[0.017]
Mean for After-payday	0.53	0.60	0.58	0.54	0.58	0.59

*Notes:* The table examines before-after payday differences in the subjective perception of scarcity for the more financially strained subgroups. It shows results from multivariate regressions where the dependent variables shown in italics are jointly regressed on the before-payday dummy and a constant. With the exception of the question “Relative to other days this month, how concerned were you...”, participants answered the questions by choosing among the options “Never”; “Rarely”; “Sometimes”; “Fairly Often”; and “Very Often”, which were converted to a 1 to 5 scale. Participants answered the question “Relative to other days this month, how concerned were you...” by choosing a point along a continuous scale, which was normalized to range from 0 to 1.  $N = 592$  (1<sup>st</sup> column), 472 (2<sup>nd</sup> column), 571 (3<sup>rd</sup> column), 470 (4<sup>th</sup> column), 547 (5<sup>th</sup> column), and 578 (last column). Standard errors in brackets.

Table H8: Access to Credit and Total Expenditures

<i>Total Expenditures</i>			
	No Credit Card	Bottom Half Credit Limit	Credit Application Denied
<b>Study 1</b>			
{Before Payday}	-\$155 [55]***	-\$150 [52]***	-\$244 [85]***
Constant	\$500 [39]***	\$500 [37]***	\$600 [59]***
<i>N Observations</i>	474	522	251
<b>Study 2</b>			
{Before Payday}	-\$390 [49]***	-\$300 [38]***	-
Constant	\$690 [35]***	\$600 [27]***	-
<i>N Observations</i>	596	1,202	-

*Notes:* This table investigates if the before vs. after payday difference in expenditures is larger for subgroups with less access to credit. It reports results from quantile regressions (quantile 0.5) of total expenditures on the before-payday indicator variable and a constant. Robust standard errors in brackets.

Table H9: Access to Credit and Cognitive Control

	<i>Ln(Time)</i>			<i>{Correct}</i>		
	Bottom Half		Credit	Bottom Half		Credit
	No Credit Card	Credit Limit	Application Denied	No Credit Card	Credit Limit	Application Denied
<b>Study 1</b>						
{Before Payday}	-0.02 [0.046]	-0.01 [0.043]	-0.02 [0.059]	0.02 [0.016]	0.02 [0.015]	-0.02 [0.022]
Constant	8.09 [0.045]***	8.11 [0.043]***	8.12 [0.061]***	0.84 [0.019]***	0.84 [0.018]***	0.89 [0.023]***
<i>N Observations</i>	8,992	9,911	4,790	8,992	9,911	4,790
<i>N Trials</i>	8,992	9,911	4,790	8,992	9,911	4,790
<i>N Subjects</i>	475	523	253	475	523	253
<b>Study 2</b>						
{Before Payday}	0.01 [0.024]	-0.01 [0.017]	-	0.01 [0.020]	0.00 [0.014]	-
Constant	7.81 [0.021]***	7.80 [0.015]***	-	0.77 [0.020]***	0.78 [0.013]***	-
<i>N Observations</i>	32,237	63,552		32,237	63,552	
<i>N Trials</i>	32,237	63,552	-	32,237	63,552	-
<i>N Subjects</i>	675	1,331		675	1,331	

*Notes:* This table reports results from OLS regressions of log response time or an indicator variable for a correct response on an indicator variable for the before-payday group and a constant (the regressions include trial-specific dummies). Standard errors are clustered at the individual level. The number of observations is larger than in Appendix Table H8 because about 8% of the sample did not report expenditures.

# Appendix I.

## Miscellaneous



Table I1. Intertemporal Choices and Credit Card Ownership (Study 1)

	Monetary		Non-Monetary	
	\$ Amount Sooner Reward		Monthly Discount Rate	
	No Credit Card	Credit Card	No Credit Card	Credit Card
{Before Payday} * {Immediate Rewards/Task}	15.3 [5.95]***	6.6 [5.10]	-0.05 [0.037]	-0.01 [0.034]
{Before Payday} * Interest Rate	-1.1 [4.14]	5.6 [4.71]	-	-
{Before Payday} * Delay Time	-0.5 [1.56]	-2.1 [1.47]	-	-
{Before Payday}	-5.6 [14.31]	-6.5 [13.69]	0.04 [0.039]	-0.01 [0.037]
{Immediate Rewards/Task}	-5.6 [4.37]*	-3.4 [3.61]	0.08 [0.025]***	0.09 [0.025]***
Interest Rate	-32.0 [2.96]***	-59.7 [3.39]***	-	-
Delay Time	-1.6 [1.03]	-0.3 [1.03]	-	-
Constant	294.2 [9.53]***	313.9 [9.89]***	0.28 [0.027]***	0.34 [0.027]***
<i>N Observations</i>	5,628	6,816	920	1,112
<i>N Choices</i>	5,628	6,816	4,600	5,560
<i>N Subjects</i>	469	568	460	556

*Notes:* This table re-estimates the intertemporal choice results separately for credit card owners and those without a credit card. Column ‘Monetary’ reports results from an OLS regression where the dependent variable is the dollar amount of the sooner payment. “Immediate Rewards” is an indicator variable that is 1 if the mailing date of the sooner payment is today. “Delay Time” is the time interval between the sooner and later payments. The sample is restricted to the subjects who made all 12 choices in the task with monetary rewards. Column ‘Non-Monetary’ reports estimates from an interval regression where the dependent variable is the interval measure of the individual discount rate (IDR). Two IDRs are estimated for each subject; one for each time frame. “Immediate Task” is an indicator variable for the “5 days (sooner) x 35 days (later)” time frame. Standard errors clustered at the individual level. The sample is restricted to the subjects who made all 10 choices in the non-monetary intertemporal task. Indicator variables are in curly brackets.

Table I2. Correlations between  
Performance in Cognitive Function Tasks and Cognitive Abilities (Study 1)

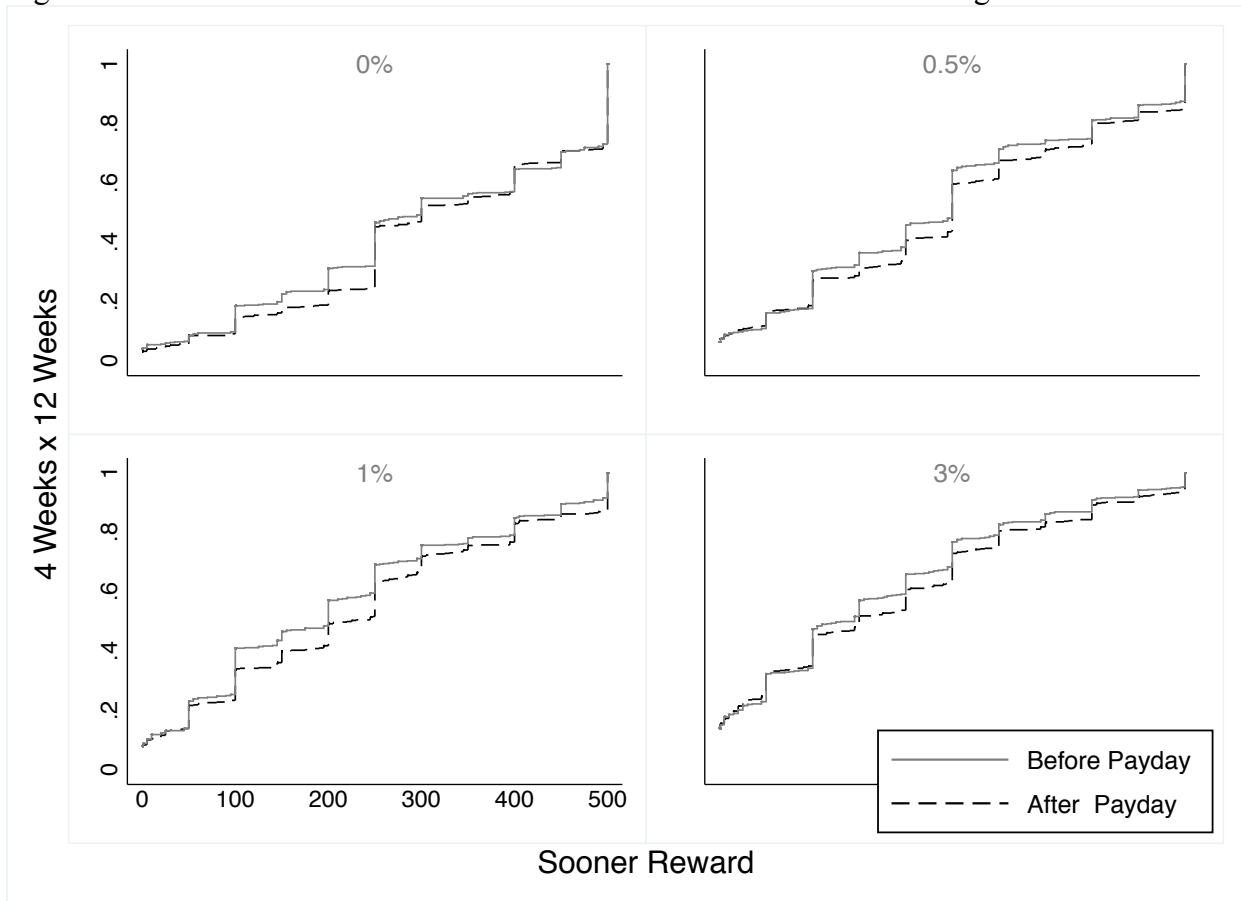
	<i>Inhibitory Control (Flanker)</i>		<i>Working Memory</i>	<i>Cog. Reflection</i>
	Ln(Time)	% Correct	Memory Span	% Correct
Abstract Reasoning - Fluid + Visual	-0.08 (1,047)**	0.22 (1,047)***	0.29 (1,012)***	0.32 (1,016)***
Antonyms - Crystallized	-0.09 (1,049)***	0.26 (1,049)***	0.16 (1,014)***	0.27 (1,018)***
Number Series - Fluid	-0.13 (996)***	0.23 (996)***	0.23 (964)***	0.34 (967)***
Picture Vocabulary - Crystallized	-0.08 (996)***	0.24 (996)***	0.12 (964)***	0.24 (967)***
Verbal Analogies - Fluid + Crystallized	-0.09 (996)***	0.22 (996)***	0.20 (964)***	0.27 (967)***

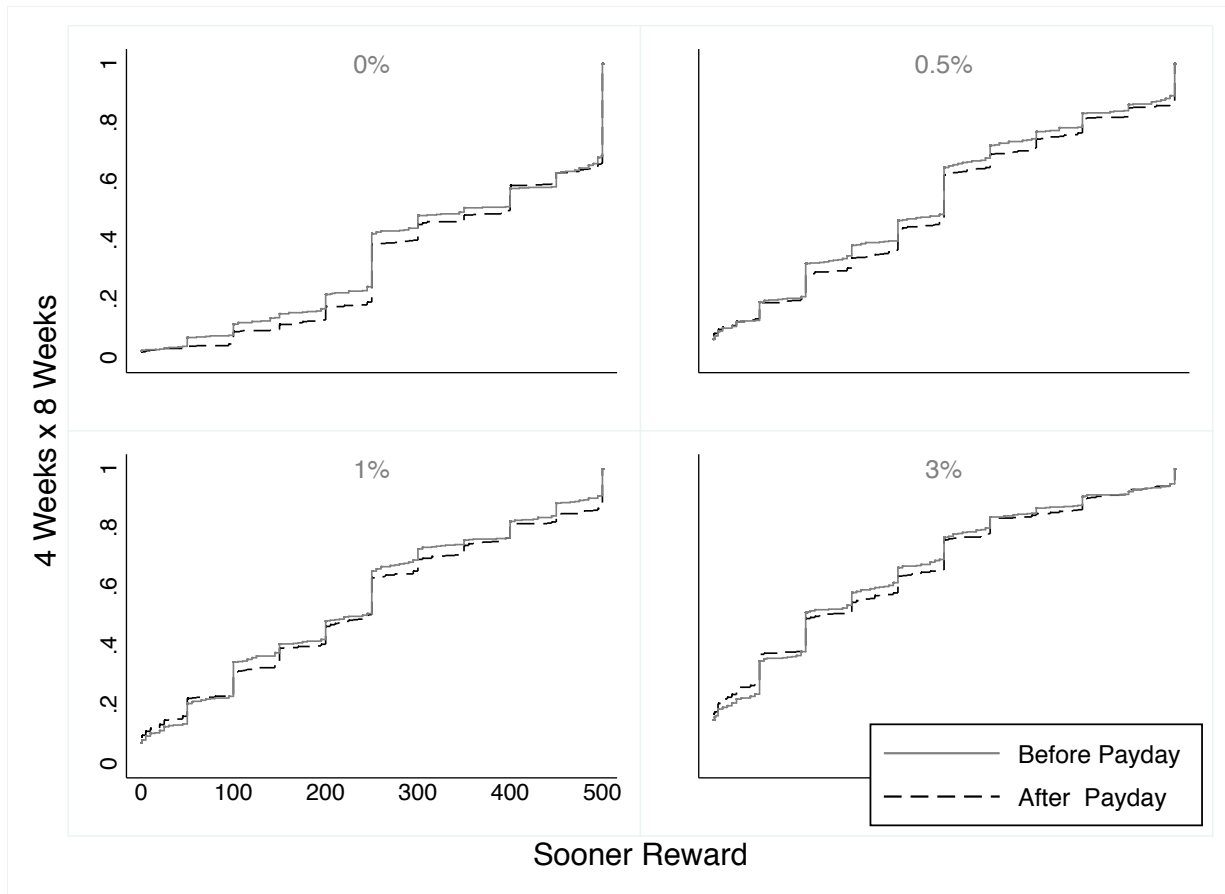
*Notes:* The table shows correlations between measures of cognitive function and measures of cognitive abilities. Numbers of observations in parentheses.

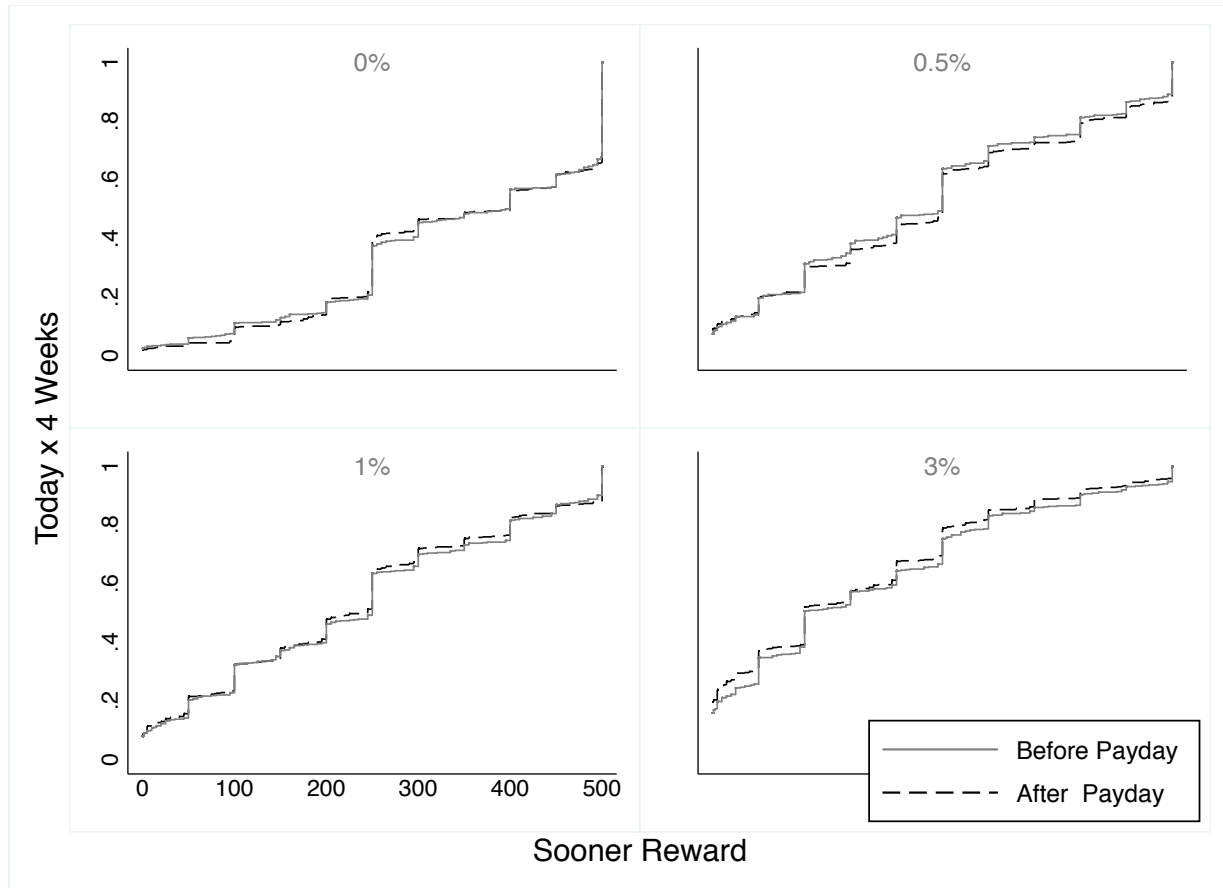
# Appendix J.

## Convex Time Budget Task

Figure J1: Cumulative Distribution of Sooner Reward in Convex Time Budget Task







*Notes:* The figures above show the cumulative distribution of choices of the sooner reward for a given time frame and experimental interest rate, separately for the before-payday and after-payday groups.  $N = 1,060$ .

The framework considers an agent with time separable utility, constant-relative-risk-aversion (CRRA) risk preferences, and quasi-hyperbolic time preferences. In the experimental task, subjects had to decide how to intertemporally allocate an endowment of \$500 between two payments. The (experimental) budget constraint they faced was:

$$(1) \quad SR + \frac{LR}{1+r} = 500 \quad \text{and} \quad 500 \geq SR \geq 0,$$

where  $SR$  is the dollar amount of the first check,  $LR$  is the dollar amount of the second check, and  $r$  is the experimental interest rate. Following Andreoni, Kuhn and Sprenger (2013), subjects are assumed to make their choices by maximizing the following:<sup>1</sup>

$$(2) \quad \max_{SR, LR} [(SR)^\alpha + \beta^I \delta^k (LR)^\alpha] / \alpha \quad \text{s.t. (1)}.$$

The parameters of interest are:  $\alpha$ , the curvature of the utility function;  $\beta$ , the present bias coefficient; and  $\delta$ , the (weekly) discount factor.  $I$  is an indicator variable that is equal to 1 if the mailing date of the first payment is today and 0 otherwise.  $k$  is the time interval (in number of weeks) between the first and second payments.

The first order is given by:

$$(3) \quad (SR)^{\alpha-1} = \beta^I \delta^k (1+r) (LR)^{\alpha-1}.$$

Taking logs and rearranging, we obtain the following estimating equation:

$$(4) \quad \ln\left(\frac{LR}{SR}\right) = \left[\frac{\ln\beta}{1-\alpha} * I\right] + \left[\frac{\ln\delta}{1-\alpha} * k\right] + \left[\frac{1}{1-\alpha} * \ln(1+r)\right].$$

The estimated results are shown in the table below.

---

<sup>1</sup> That is, additional utility parameters (e.g., Stone-Geary consumption minima, intertemporal references or background consumption) are assumed to equal zero.

Table J1: Utility-Function Parameter Estimates

<i>Parameters</i>	Coefficient	Standard Error
Before-After Difference in Curvature	-0.001	0.001
Before-After Difference in Present Bias	-0.002	0.001*
Before-After Difference in Annual Discount Rate	-0.016	0.014
Curvature After-Payday Group	0.990	0.001***
Present Bias After-Payday Group	0.996	0.001***
Annual Discount Rate After-Payday Group	0.094	0.001***

*Notes:* This table reports utility-function parameters estimated from intertemporal choices subjects made in the Convex Time Budget task. The estimation uses a two-limit Tobit estimator to correct for censoring. Risk preferences are assumed to be of the constant-relative-risk-aversion (CRRA) form and additional utility parameters (e.g., Stone-Geary consumption minima, intertemporal references or background consumption) to equal zero. Standard errors are clustered at the individual level. The sample is restricted to the 1,060 subjects who made all 12 choices in the task with monetary rewards.  $N = 12,720$ . The significance stars correspond to hypothesis tests of whether the coefficients are statistically different from zero.



# Appendix K.

## Study 2's Risk Choice Task Tutorial

This is an experiment in decision-making. Please pay careful attention to the instructions as a considerable amount of points could be at stake.

In this experiment, your payment will depend on the toss of a coin. And your task will be to decide how much you want to receive if the coin comes up heads and how much you want to receive if the coin comes up tails.

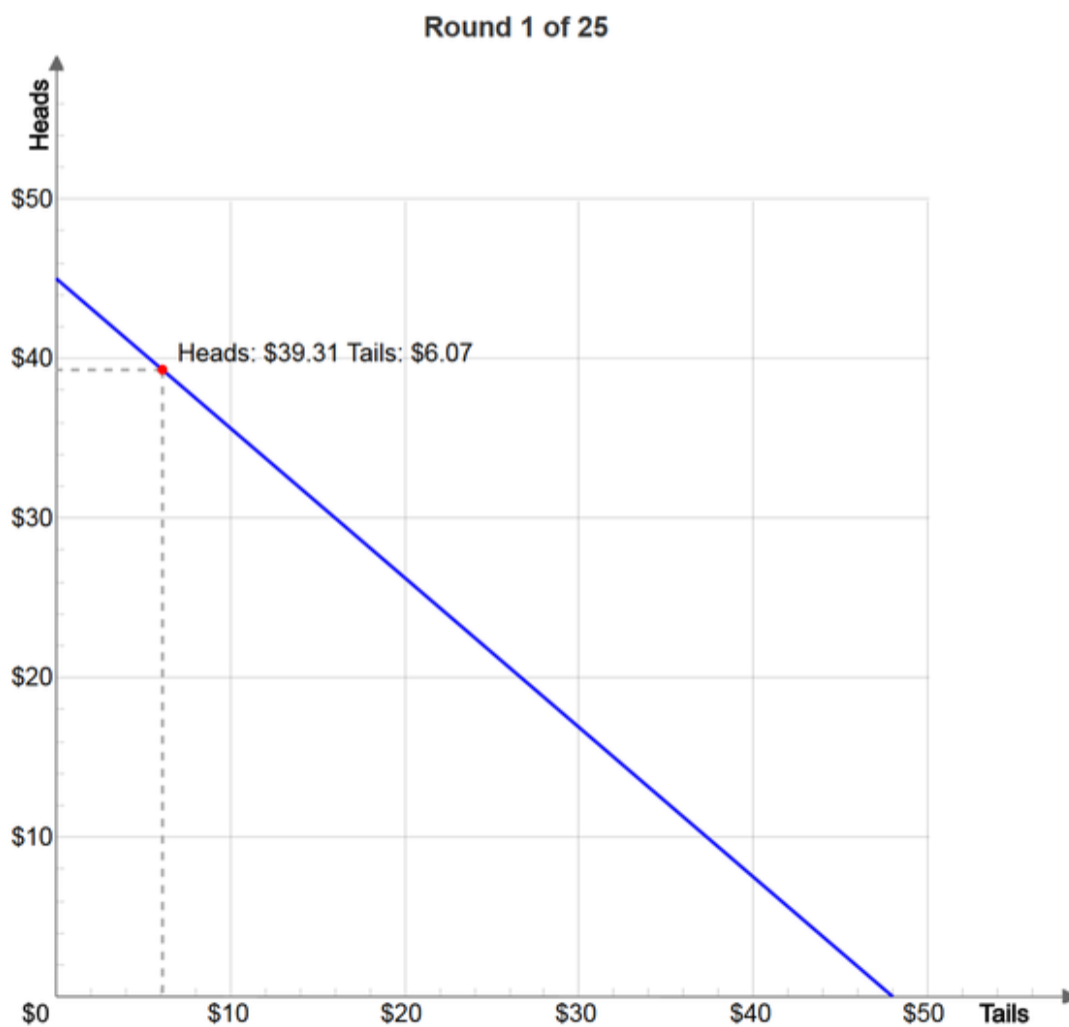
For simplicity you will make your decisions in terms of dollar amounts. The dollar amounts will be converted at the end to points using the rate 1,000 points = \$1.



Next >>

In each problem you will be asked to choose a point that is on a line like the one shown in this example. The line represents all the possible combinations of payments you can choose to receive. The vertical axis shows the dollar amount you will receive if the coin comes up heads. The horizontal axis shows the amount you will receive if the coin comes up tails.

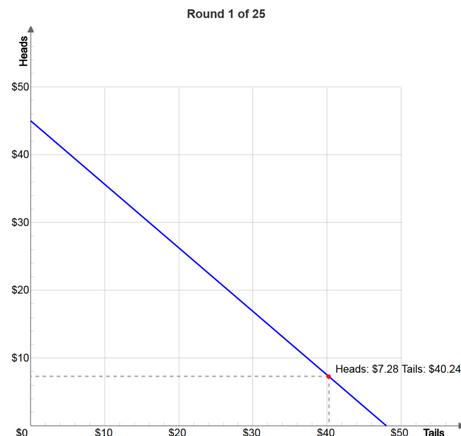
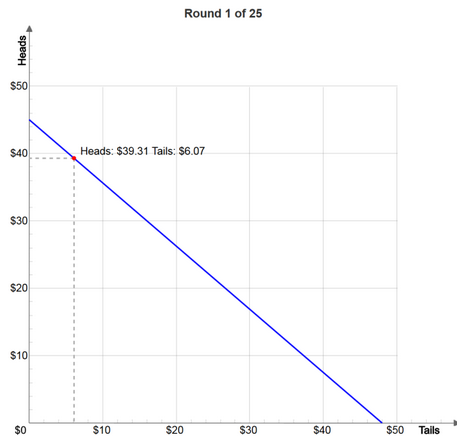
By selecting a point on the line, you are choosing how much you want to receive if the coin comes up heads and how much you want to receive if the coin comes up tails. For example, if you chose the point shown by the red marker, you would receive \$39.31 if the coin came up heads and \$6.07 if it came up tails.



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Next >>

Notice the trade-off between heads and tails. To increase the amount paid when the coin comes up heads, you have to reduce the amount paid when it comes up tails. To increase the amount paid when the coin comes up tails, you have to reduce the amount paid when it comes up heads.



The graph on the left illustrates a choice that pays more (\$39.31) when the coin comes up heads and less (\$6.07) when it comes up tails.

The graph on the right illustrates a choice that pays less (\$7.28) when the coin comes up heads and more (\$40.24) when it comes up tails.

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To select your choice, use the mouse, or your finger if you are using a touch screen, to move the pointer on the screen to the option you wish to choose, and click your mouse or trackpad once. A window like the one shown in the image below will pop up. Press “Next” to confirm your choice or “Cancel” to revise your choice. You will not be able to revise your choice after pressing “Next”.

After you click “Next”, you will be moved to the next round, where you will be asked to make a choice in a different decision problem involving a different a line and different options. In total you will be asked to make 25 decisions.

×

## Selected Point

Heads:

\$39.31

Tails:

\$6.07

Cancel

Next

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Next >>

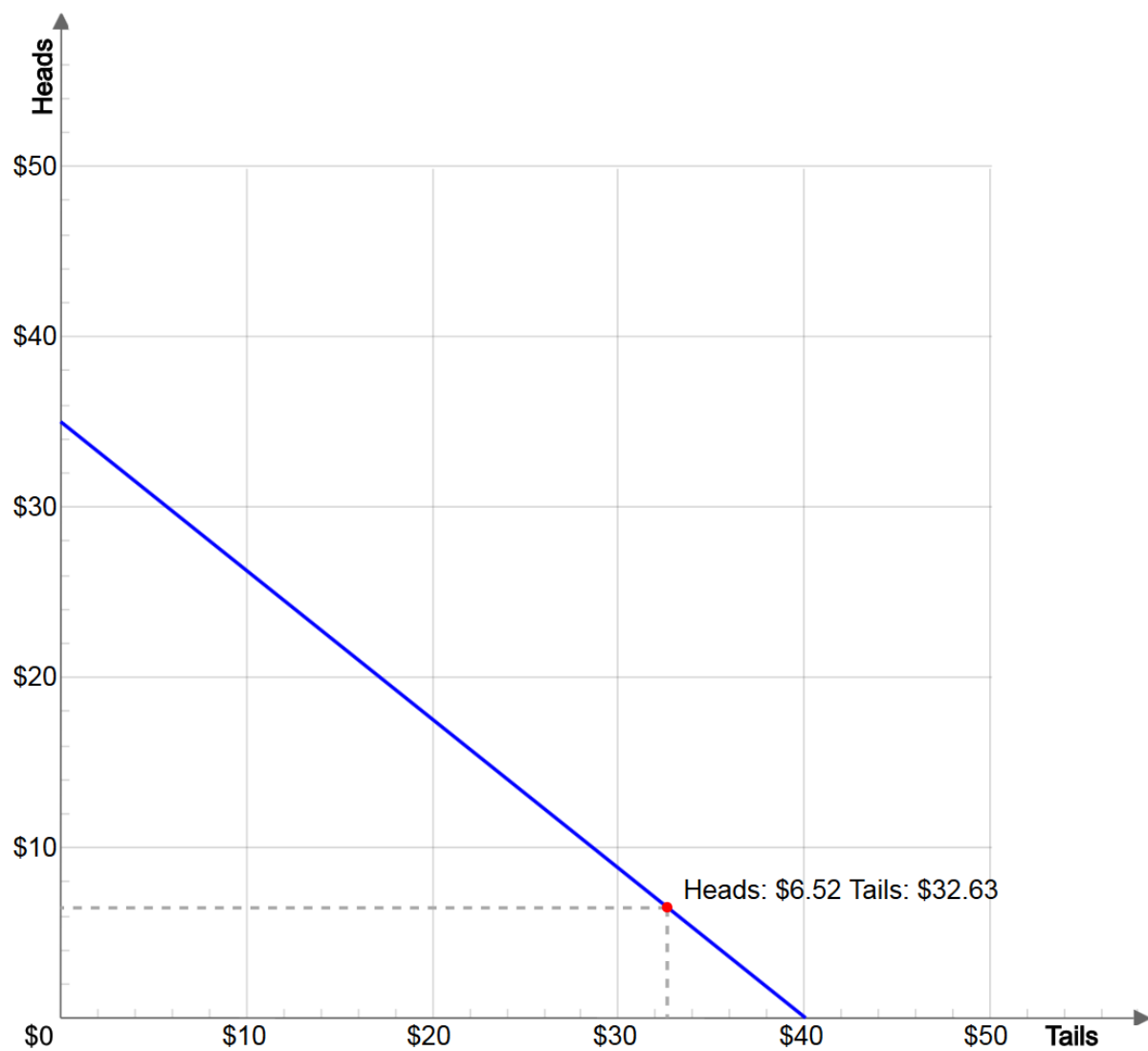
Next, you will have two practice rounds. The choices you make in these two rounds will not affect how much money you will be paid.

Remember: In each round, you have to decide how much you want to receive if the coin comes up heads and how much you want to receive if the coin comes up tails. To select your choice, use the mouse, or your finger if you are using a touch screen, to move the pointer on the screen to the option you wish to choose. When you are ready to make your decision, click to enter your chosen option. Press “Next” to confirm your choice.

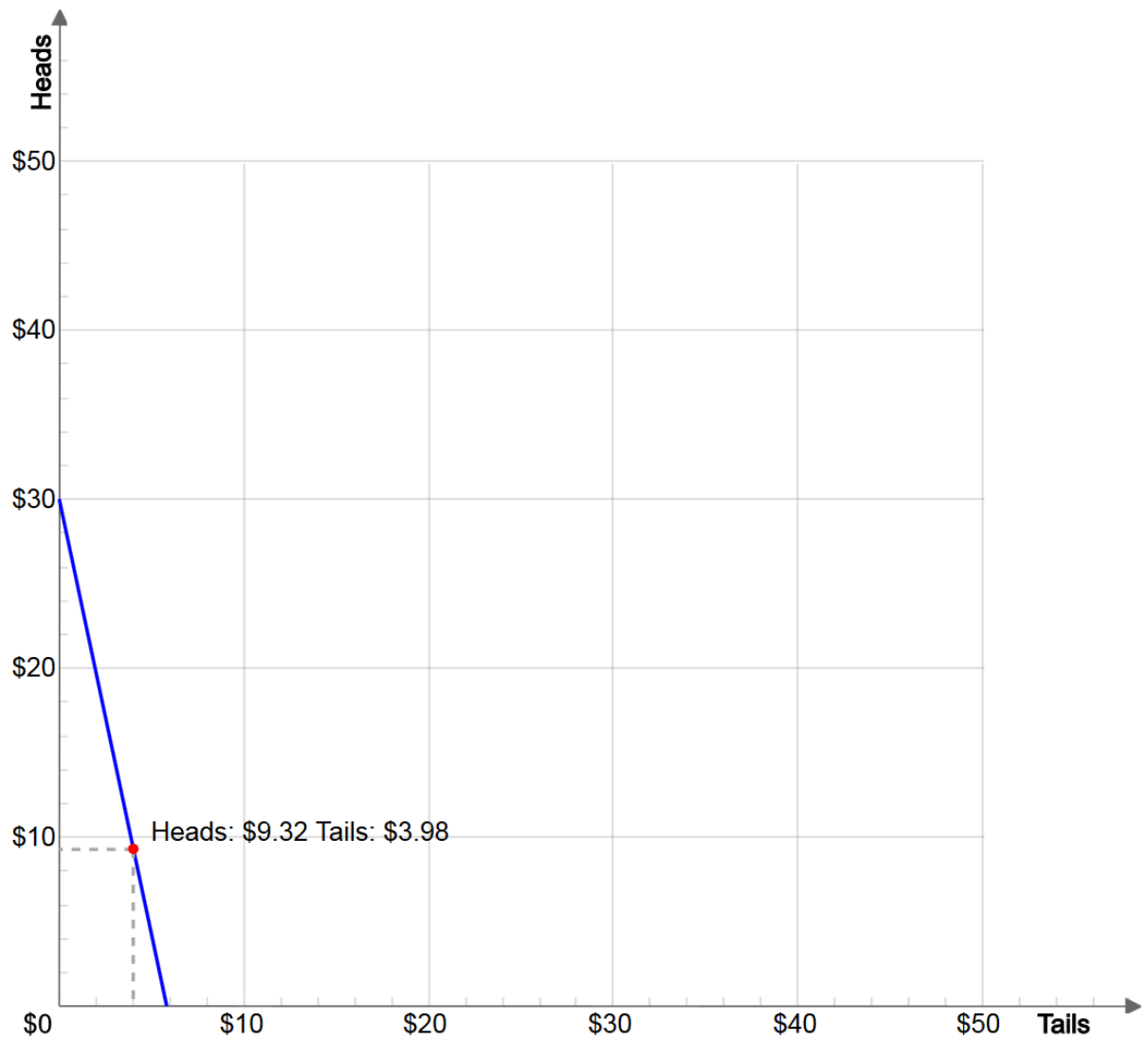
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Next >>

### Practice Round 1 of 2



### Practice Round 2 of 2





Your chances of being selected for actual payment are 1 in 10.

Around 200 out of 2,000 participants will be selected at random to earn real money based on their choices.

If you are one of them, at the end of the survey the computer will randomly select one of the 25 problems for payment and you will be paid according to the choice you made in the selected problem.

Suppose that the computer selects problem 12 for payment. Let's say that in problem 12 you chose to receive \$20 if the coin came up heads and \$40 if it came up tails. Now the computer will randomly select "heads" or "tails." If problem 12 and heads are selected, you will be paid \$20 dollars. If problem 12 and tails are selected, you will be paid \$40 dollars.

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We will now ask you to make 25 decisions similar to the one you just practiced. Think carefully about each one of these decisions because any one of them could be selected for payment.

Notice that there is no wrong or right choice. You should decide how much you want to receive if the coin comes up heads and how much you want to receive if the coin comes up tails. The chances of the coin coming up heads or tails are the same.

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