

A Simple Approach for Measuring Higher-Order Arrow-Pratt Coefficients of Risk Aversion

Cary Deck, Rachel Huang, Larry Tzeng, Lin Zhao

Supplementary Material: Subject Instructions

[Page 1 – General Instructions]

Welcome

This is a study about decision-making. You will be paid in cash based upon your choices so it is important that you understand these instructions completely before making your choices. If you have a question at any point, please raise your hand and someone will come to you to answer your question in private. Otherwise, you should not talk to anyone and you should not do anything to disrupt others. Also, please turn off and put away any cell phones or other electronic devices.

In this study, you will complete 27 tasks. After the study, one (and only one) of these tasks will be selected at random and your payment (inclusive of your \$5 participation payment) will be based on that task. All amounts you will be shown are in US dollars.

There are 3 phases with 9 tasks per phase. In each phase, you will have to decide what you want to do with each of nine 50-50 lotteries, a separate 50-50 lottery is associated with each task. More instructions will be provided before each phase, but what you do in one phase has no bearing on another phase.

50-50 Lotteries

A 50-50 lottery is where you have an equal chance of receiving one of two possible payouts. This is like a coin flip determining which of two amounts you get.

Nine 50-50 lotteries are shown on your screen as ovals, each with two possible payouts --- one in each half of the oval. One of the payouts is in **green** indicating how much money you might gain while the other payout is in **red** indicating how much money you might lose. That is, each lottery gives you a 50% chance of gaining the **green** payout on the left side of the oval and a 50% chance of losing the **red** payout on the right side of the oval.

The 1st lottery has the payouts **0** and **-8** meaning you are equally likely to gain **0** or lose **8**. Notice this means that playing the first lottery means you could lose money but you cannot gain money.

In the 2nd lottery the payoffs are **1** and **-7** meaning you are equally likely to gain **1** or lose **7**. The 2nd lottery is similar to the 1st lottery, but has had 1 added to both sides.

As you go further down the list of lotteries more and more money is added to both payouts. From one lottery to the next, the same amount is added to both payouts so the difference between them is always 8.

By the 9th lottery the payoffs are 8 and 0 meaning you are equally likely to gain 8 or lose 0. Notice this means that playing the last lottery means you could gain money but you cannot lose money.

Questions?

When you are ready, press **Continue** for the instructions for the first phase. But if you have a question at this point, please raise your hand before pressing the button.

[Page 2 – Task of Order 2 Instructions]

Phase 1

In Phase 1 you start with an endowment of 18.

For each task, you have to decide if you want to play the lottery or not.

- ➔ Selecting “Play” means that you want the outcome of the lottery to be included in your payment.
- ➔ Selecting “Decline” means that you do not want the outcome of the lottery to be included in your payment.

Looking at the 1st task (the one with a lottery that has payouts 0 and -8), if you choose to decline the lottery you will earn 18 for this task. But, if you choose to play the lottery there is a 50% chance you will earn $18+0 = 18$ and a 50% chance you will earn $18-8 = 10$ for this task.

Looking at the 2nd task (the one with payouts of 1 and -7), if you choose to decline the lottery you will earn 18 for this task. But, if you choose to play the lottery there is a 50% chance you will earn $18+1 = 19$ and a 50% chance you will earn $18-7 = 11$ for this task.

Looking at the 9th task, (the one with payouts 8 and 0) if you choose to decline the lottery you will earn 18 for this task. But, if you choose to play the lottery there is a 50% chance you will earn $18+8 = 26$ and a 50% chance you will earn $18-0 = 18$ for this task.

Reminder

Keep in mind that once all three phases of the study are complete, one (and only one) task will be *selected at random* and your payment will depend only on what you chose for that task.

- ➔ You should treat each task as if it will be the only task affecting your payment.
- ➔ Your choice for one task has no bearing on whether the task is selected.

If your payment does depend on a 50-50 lottery, we will use a spinner like you might find in a board game to determine what payout you receive.

Questions?

When you are ready, press [Continue](#) to make your nine choices for the first phase. But if you have a question at this point, please raise your hand before pressing the button.

[Response Form for Tasks of Order 2]

<p>A</p> <div style="text-align: center;"> </div> <p style="text-align: right;">18</p>	<p>Play <input type="radio"/></p>	<p>#1</p> <div style="text-align: center;"> </div> <p style="text-align: center;">←- or -></p>	<p><input checked="" type="radio"/> Decline</p>	<p>B</p> <div style="text-align: center; height: 70px;">18</div>
<p>A</p> <div style="text-align: center;"> </div> <p style="text-align: right;">18</p>	<p>Play <input type="radio"/></p>	<p>#2</p> <div style="text-align: center;"> </div> <p style="text-align: center;">←- or -></p>	<p><input checked="" type="radio"/> Decline</p>	<p>B</p> <div style="text-align: center; height: 70px;">18</div>
<p>A</p> <div style="text-align: center;"> </div> <p style="text-align: right;">18</p>	<p>Play <input type="radio"/></p>	<p>#3</p> <div style="text-align: center;"> </div> <p style="text-align: center;">←- or -></p>	<p><input checked="" type="radio"/> Decline</p>	<p>B</p> <div style="text-align: center; height: 70px;">18</div>
<p>A</p> <div style="text-align: center;"> </div> <p style="text-align: right;">18</p>	<p>Play <input type="radio"/></p>	<p>#4</p> <div style="text-align: center;"> </div> <p style="text-align: center;">←- or -></p>	<p><input checked="" type="radio"/> Decline</p>	<p>B</p> <div style="text-align: center; height: 70px;">18</div>
<p>A</p> <div style="text-align: center;"> </div> <p style="text-align: right;">18</p>	<p>Play <input type="radio"/></p>	<p>#5</p> <div style="text-align: center;"> </div> <p style="text-align: center;">←- or -></p>	<p><input checked="" type="radio"/> Decline</p>	<p>B</p> <div style="text-align: center; height: 70px;">18</div>
<p>A</p> <div style="text-align: center;"> </div> <p style="text-align: right;">18</p>	<p>Play <input type="radio"/></p>	<p>#6</p> <div style="text-align: center;"> </div> <p style="text-align: center;">←- or -></p>	<p><input checked="" type="radio"/> Decline</p>	<p>B</p> <div style="text-align: center; height: 70px;">18</div>
<p>A</p> <div style="text-align: center;"> </div> <p style="text-align: right;">18</p>	<p>Play <input checked="" type="radio"/></p>	<p>#7</p> <div style="text-align: center;"> </div> <p style="text-align: center;">←- or -></p>	<p><input type="radio"/> Decline</p>	<p>B</p> <div style="text-align: center; height: 70px;">18</div>
<p>A</p> <div style="text-align: center;"> </div> <p style="text-align: right;">18</p>	<p>Play <input checked="" type="radio"/></p>	<p>#8</p> <div style="text-align: center;"> </div> <p style="text-align: center;">←- or -></p>	<p><input type="radio"/> Decline</p>	<p>B</p> <div style="text-align: center; height: 70px;">18</div>
<p>A</p> <div style="text-align: center;"> </div> <p style="text-align: right;">18</p>	<p>Play <input type="radio"/></p>	<p>#9</p> <div style="text-align: center;"> </div> <p style="text-align: center;">←- or -></p>	<p><input type="radio"/> Decline</p>	<p>B</p> <div style="text-align: center; height: 70px;">18</div>

[Page 3 – Task of Order 3 Instructions]

Phase 2

The nine tasks in Phase 2 involve the same set of nine 50-50 lotteries as Phase 1.

What has changed is that rather than starting with an endowment of 18, you are equally likely to start with an endowment of 13 or 23. This is why there is a large oval with the amounts 13 and 23 in it.

What you have to decide is if you would rather play the lottery associated with the task when you start with an endowment of 13 or when you start with an endowment of 23. This is why the options show the 50-50 lottery associated with the task inside the bigger 50-50 lottery about the endowment being either 13 or 23.

Notice that you cannot reject a lottery in Phase 2. Rather, you have to decide if you want to play the lottery if you get the “Smaller” initial endowment or if you get the “Larger” initial endowment.

An Example

Let’s look at the 2nd task (the one with payouts of 1 and -7).

- If you choose “Smaller” there is a 50% chance that you will earn 13 + the 1 or -7 lottery & there is a 50% chance you will earn 23. This means there is
 - 25% chance you earn $13+1 = 14$
 - 25% chance you earn $13-7 = 6$
 - 50% chance you earn 23
- If you choose “Larger” there is a 50% chance that you will earn 13 & there is a 50% chance you will earn 23 + the 1 or -7 lottery. This means there is
 - 50% chance you will earn 13
 - 25% chance you earn $23+1 = 24$
 - 25% chance you earn $23-7 = 16$

Questions?

When you are ready, press **Continue** to make your nine choices for the second phase. But if you have a question at this point, please raise your hand before pressing the button.

[Response Form for Tasks of Order 3]

<p>A</p>	<p>Smaller <input type="radio"/></p>	<p>#1</p> <p><- or -></p>	<p><input checked="" type="radio"/> Larger</p>	<p>B</p>
<p>A</p>	<p>Smaller <input type="radio"/></p>	<p>#2</p> <p><- or -></p>	<p><input checked="" type="radio"/> Larger</p>	<p>B</p>
<p>A</p>	<p>Smaller <input type="radio"/></p>	<p>#3</p> <p><- or -></p>	<p><input checked="" type="radio"/> Larger</p>	<p>B</p>
<p>A</p>	<p>Smaller <input type="radio"/></p>	<p>#4</p> <p><- or -></p>	<p><input checked="" type="radio"/> Larger</p>	<p>B</p>
<p>A</p>	<p>Smaller <input type="radio"/></p>	<p>#5</p> <p><- or -></p>	<p><input checked="" type="radio"/> Larger</p>	<p>B</p>
<p>A</p>	<p>Smaller <input type="radio"/></p>	<p>#6</p> <p><- or -></p>	<p><input checked="" type="radio"/> Larger</p>	<p>B</p>
<p>A</p>	<p>Smaller <input type="radio"/></p>	<p>#7</p> <p><- or -></p>	<p><input checked="" type="radio"/> Larger</p>	<p>B</p>
<p>A</p>	<p>Smaller <input checked="" type="radio"/></p>	<p>#8</p> <p><- or -></p>	<p><input type="radio"/> Larger</p>	<p>B</p>
<p>A</p>	<p>Smaller <input type="radio"/></p>	<p>#9</p> <p><- or -></p>	<p><input type="radio"/> Larger</p>	<p>B</p>

[Page 4 – Task of Order 4 Instructions]

Phase 3

The nine tasks in Phase 3 involve the same set of nine 50-50 lotteries as Phases 1 & 2.

Like Phase 1 you will start with an initial endowment of 18. What is different is that there is a 50% chance you will play an additional 50-50 lottery in which you are equally likely to gain 5 or lose 5.

What you have to decide is if you would rather play the lottery associated with the task when you play the additional lottery or when you do not play the additional lottery. This is why the options show the 50-50 lottery associated with the task inside the bigger 50-50 lottery about the endowment and the 5 or -5 lottery.

Notice that you cannot reject the lottery associated with a task in Phase 3 nor can you reject the additional lottery. Rather, for each task you have to decide if you want these two lotteries “Together” (meaning you play both or neither) or “Separate” (meaning you play one or the other).

An Example

Let’s look at the 2nd task (the one with payouts of 1 and -7).

- If you choose “Together” there is a 50% chance that you will earn 18 + the 1 or -7 lottery + the 5 or -5 lottery & a 50% chance you will earn 18. This means there is a
- 12.5% chance you earn $18+1+5= 24$
 - 12.5% chance you earn $18-7+5= 16$
 - 12.5% chance you earn $18+1-5= 14$
 - 12.5% chance you earn $18-7-5= 6$
 - 50% chance you earn 18

If you choose “Separate” there is a 50% chance that you will earn 18 + the 1 or -7 lottery & a 50% chance you will earn 18 + the 5 or -5 lottery. This means there is a

- 25% chance you earn $18+1= 19$
- 25% chance you earn $18-7= 11$
- 25% chance you earn $18+5= 23$
- 25% chance you earn $18-5= 13$

Questions?

When you are ready, press **Continue** to make your nine choices for the third phase. But if you have a question at this point, please raise your hand before pressing the button.

[Response Form for Tasks of Order 4]

<p>A</p>	<p>Together <input checked="" type="radio"/></p>	<p>#1</p> <p><- or -></p>	<p><input type="radio"/> Separate</p>	<p>B</p>
<p>A</p>	<p>Together <input checked="" type="radio"/></p>	<p>#2</p> <p><- or -></p>	<p><input type="radio"/> Separate</p>	<p>B</p>
<p>A</p>	<p>Together <input checked="" type="radio"/></p>	<p>#3</p> <p><- or -></p>	<p><input type="radio"/> Separate</p>	<p>B</p>
<p>A</p>	<p>Together <input type="radio"/></p>	<p>#4</p> <p><- or -></p>	<p><input checked="" type="radio"/> Separate</p>	<p>B</p>
<p>A</p>	<p>Together <input type="radio"/></p>	<p>#5</p> <p><- or -></p>	<p><input checked="" type="radio"/> Separate</p>	<p>B</p>
<p>A</p>	<p>Together <input type="radio"/></p>	<p>#6</p> <p><- or -></p>	<p><input checked="" type="radio"/> Separate</p>	<p>B</p>
<p>A</p>	<p>Together <input type="radio"/></p>	<p>#7</p> <p><- or -></p>	<p><input checked="" type="radio"/> Separate</p>	<p>B</p>
<p>A</p>	<p>Together <input type="radio"/></p>	<p>#8</p> <p><- or -></p>	<p><input checked="" type="radio"/> Separate</p>	<p>B</p>
<p>A</p>	<p>Together <input type="radio"/></p>	<p>#9</p> <p><- or -></p>	<p><input type="radio"/> Separate</p>	<p>B</p>