

Supplementary Materials

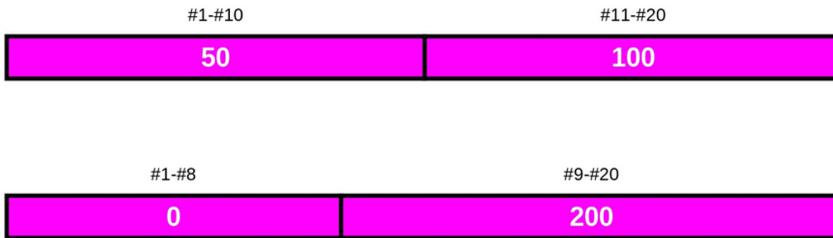
Supplementary Items for Experiment 1

The Risky Choice Experiment

Welcome to the risky choice experiment.

In this experiment you will be asked to choose between pairs of lotteries. Each lottery offers a set of tickets. You need to choose which lottery you'd rather play.

These pictures tell you about each lottery.



The top picture represents a lottery with 20 tickets. In the top lottery, 10 tickets (tickets numbered #1–#10) each have a prize of \$50 and 10 tickets (numbered #11–#20) each have a prize of \$100. The bottom lottery also has 20 tickets. In the bottom lottery, 8 tickets (tickets numbered #1–#8) each have a prize of \$0 and 12 tickets (tickets numbered #9–#20) each have a prize of \$200.

To play the lottery you draw one of the tickets from the bag at random without looking. You win whatever is on the ticket you draw. Think about which lottery would you rather play?

As well as paying you for taking part, we are going to select one person to play out their choice for real. Whichever lottery they choose, we will draw them a ticket here at the University and pay them whatever is written on the ticket. It could be you, and it could be a lot of money, so choose carefully.

As in all psychology experiments, you can withdraw from this study at any time for any reason. Just close your browser window!

Click Start when you are ready to see your first choice. The whole experiment will only take a few minutes.

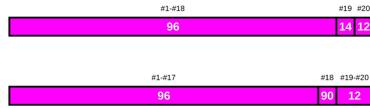
Start

Figure S1: Participant Instructions for Experiment 1

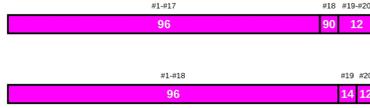
Table S1: Experiment 1: Choice Problem Sequence Across Conditions

Coalesced-Identical Condition

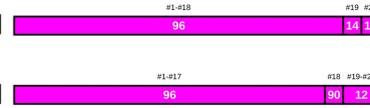
Trial 1: G^+ vs. G^-



Training: G^+ vs. G^-



Trial 2: G^+ vs. G^-



Click the gamble you prefer

Before you make more choices, we'd like to point something out. The "Toggle" button splits up some of rectangles representing tickets with the same prize into rectangles for single tickets. This doesn't change the lotteries, but it makes it much easier to compare the two lotteries. When the lotteries are split, see how one lottery matches or is better on every ticket. This lottery is better. You should toggle quite a few times, so you can see what is going on.

Click the gamble you prefer

Toggle

When you have finished toggling, click the gamble you prefer

Coalesced-Different Condition

Trial 1: F^+ vs. F^-



Training: F^+ vs. F^-



Trial 2: G^+ vs. G^-



Click the gamble you prefer

Before you make more choices, we'd like to point something out. The "Toggle" button splits up some of rectangles representing tickets with the same prize into rectangles for single tickets. This doesn't change the lotteries, but it makes it much easier to compare the two lotteries. When the lotteries are split, see how one lottery matches or is better on every ticket. This lottery is better. You should toggle quite a few times, so you can see what is going on.

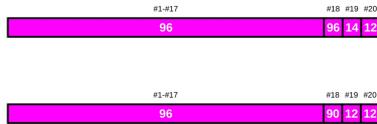
Click the gamble you prefer

Toggle

When you have finished toggling, click the gamble you prefer

Transparent Condition

Trial 1: GS^+ vs. GS^-



Click the gamble you prefer

Note: The table outlines the sequence of choice problems in each condition of Experiment 1. In each trial presentation, gambles were randomly allocated to the top and the bottom positions.

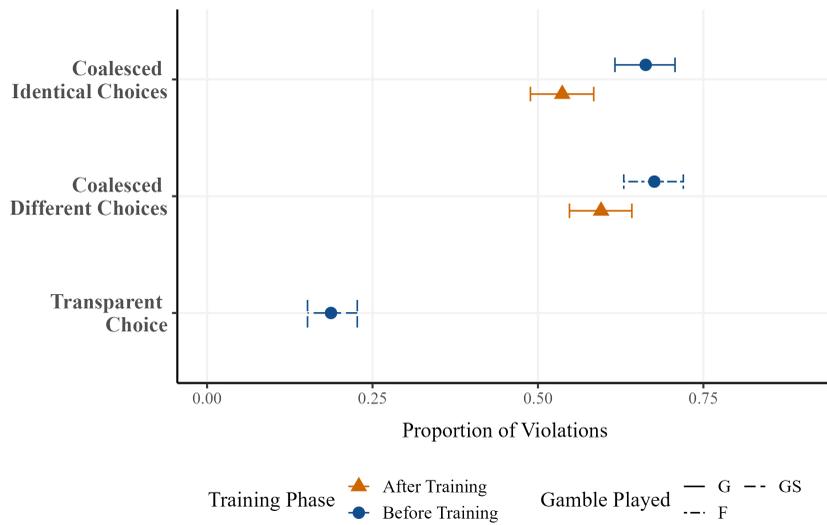


Figure S2: Rates of Violations of Stochastic Dominance in Experiment 1 (Including Outliers)

Note: Error bars represent 95% confidence intervals.

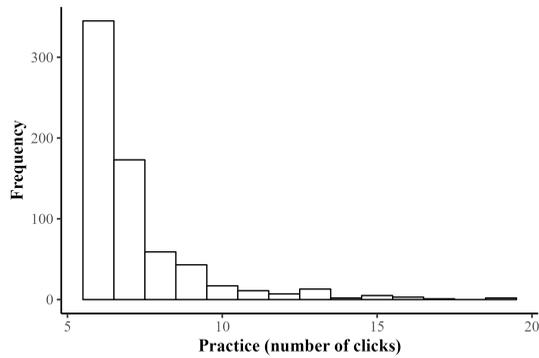


Figure S3: Participant Clicks for Toggling Gamble Branches During Training in Experiment 1

Note: Histogram of the number of clicks participants made to toggle (split or coalesce) gamble branches during training, excluding the top 1% of frequencies (over 19 clicks).

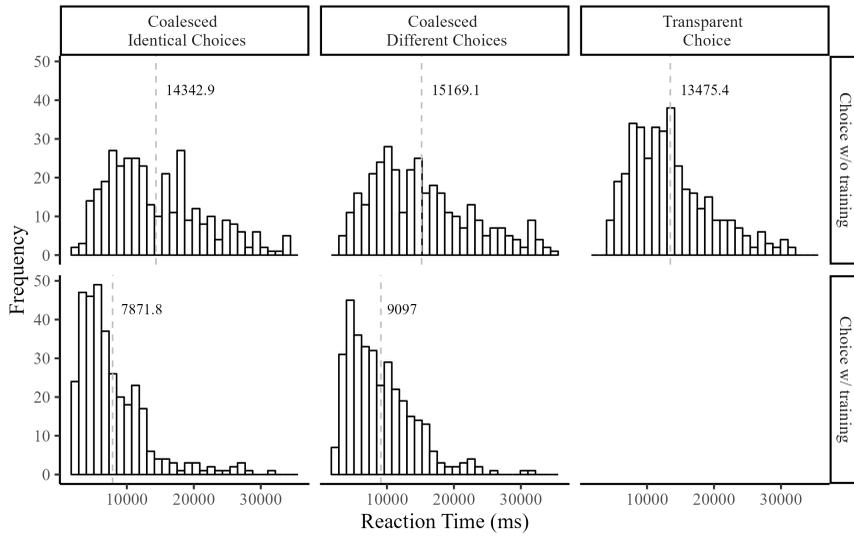


Figure S4: Histogram of Reaction Times Across Conditions in Experiment 1

Note: Dashed lines represent the mean reaction times for each condition before and after training.

Supplementary Items for Experiment 2

The Risky Choice Experiment

In this experiment, you'll be asked to choose between pairs of lotteries. Each lottery offers a set of tickets, and you'll need to decide which lottery you'd prefer to play. These images represent each lottery.

First lottery:



Second lottery:



The first image represents a lottery with 20 tickets. In this lottery, 10 tickets (numbered **#1 to #10**) each have a prize of **\$50**, and the remaining 10 tickets (numbered **#11 to #20**) each have a prize of **\$100**. The second image represents another lottery, also with 20 tickets. In this lottery, 8 tickets (numbered **#1 to #8**) each have a prize of **\$0**, and the remaining 12 tickets (numbered **#9 to #20**) each have a prize of **\$200**.

To play the lottery, you'll draw one ticket from a bag at random without looking. You'll win the amount written on the ticket you draw. Think about which lottery you'd prefer to play.

Remember that in addition to paying you for your participation, we'll select one participant to play their chosen lottery for real. We'll draw a ticket at the University for the chosen lottery, and the participant will win the amount written on the ticket. This could be you, so choose carefully!

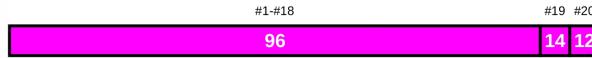
Figure S5: Participant Instructions for Experiment 2

(a) Gamble in coalesced form

Before you make more choices, we want you to consider the tickets in the boxes. The **Toggle** button divides some of the rectangles representing tickets with the same prize into individual tickets. This does not change the lotteries, but it makes it much easier to compare the two lotteries. For example, even after the split, the top lottery still has tickets numbered **#1 to #17** offering **\$96** and the bottom lottery also has tickets numbered **#1 to #17** offering **\$96**. Once the lotteries are split, try to observe how one lottery matches or is better on every ticket. This lottery is better.

You should toggle quite a few times, so you can see what is going on. After a number of toggles, the option to select your preferred gamble will appear.

Gamble A:



Gamble B:



Toggle

When you have finished toggling, select the option you prefer:

(Once you have made your selection, click on the arrow (→) at the bottom right corner to continue)

Gamble A

Gamble B

(b) Gamble in split form

Before you make more choices, we want you to consider the tickets in the boxes. The **Toggle** button divides some of the rectangles representing tickets with the same prize into individual tickets. This does not change the lotteries, but it makes it much easier to compare the two lotteries. For example, even after the split, the top lottery still has tickets numbered **#1 to #17** offering **\$96** and the bottom lottery also has tickets numbered **#1 to #17** offering **\$96**. Once the lotteries are split, try to observe how one lottery matches or is better on every ticket. This lottery is better.

You should toggle quite a few times, so you can see what is going on. After a number of toggles, the option to select your preferred gamble will appear.

Gamble A:



Gamble B:



Toggle

When you have finished toggling, select the option you prefer:

(Once you have made your selection, click on the arrow (→) at the bottom right corner to continue)

Gamble A

Gamble B

Figure S6: Training Illustration: Splitting Gambles in Experiment 2

Note: This screenshot is from the training phase, illustrating a choice where G^+ is the top gamble and G^- is the bottom gamble. During the training phase, participants could toggle between two views. As they toggled, solid vertical lines appeared and faded, highlighting the splitting and coalescing of the gamble branches.

Table S2: Experiment 2: Choice Problem Sequence in the Control Condition

Control Condition		Brief Pause		
<p>Trial 1: G^+ vs. G^-</p> <p>Gamble A: #1-#18 96 #19 #20 14 12</p> <p>Gamble B: #1-#17 96 #18 #19-#20 90 12</p> <p>Select the option you prefer: (Once you have made your selection, click on the arrow (→) at the bottom right corner to continue)</p> <p><input type="radio"/> Gamble A</p> <p><input type="radio"/> Gamble B</p>		<p>Please wait a moment for the next set of choices to appear</p>	<p>Trial 2: G^+ vs. G^-</p> <p>Gamble A: #1-#18 96 #19 #20 14 12</p> <p>Gamble B: #1-#17 96 #18 #19-#20 90 12</p> <p>Select the option you prefer: (Once you have made your selection, click on the arrow (→) at the bottom right corner to continue)</p> <p><input type="radio"/> Gamble A</p> <p><input type="radio"/> Gamble B</p>	
<p>Trial 3: F^- vs. F^+</p> <p>Gamble A: #1-#22 98 #23 #24-#25 92 4</p> <p>Gamble B: #1-#23 98 #24 #25 8 4</p> <p>Select the option you prefer: (Once you have made your selection, click on the arrow (→) at the bottom right corner to continue)</p> <p><input type="radio"/> Gamble A</p> <p><input type="radio"/> Gamble B</p>		<p>Trial 4: G^- vs. G^+</p> <p>Gamble A: #1-#17 96 #18 #19-#20 90 12</p> <p>Gamble B: #1-#18 96 #19 #20 14 12</p> <p>Select the option you prefer: (Once you have made your selection, click on the arrow (→) at the bottom right corner to continue)</p> <p><input type="radio"/> Gamble A</p> <p><input type="radio"/> Gamble B</p>		<p>Trial 5: F^+ vs. F^-</p> <p>Gamble A: #1-#23 98 #24 #25 8 4</p> <p>Gamble B: #1-#22 98 #23 #24-#25 92 4</p> <p>Select the option you prefer: (Once you have made your selection, click on the arrow (→) at the bottom right corner to continue)</p> <p><input type="radio"/> Gamble A</p> <p><input type="radio"/> Gamble B</p>

Note: The table outlines the sequence of choice problems for the Control Condition in Experiment 2. In this condition, participants received no training. They were presented with gambles G^+ and G^- , and asked to select their preferred option. After the selection, a 20-second pause followed, during which the screen displayed the message: “Please wait a moment for the next set of choices to appear,” before the next trial began. In each trial presentation, gambles were randomly allocated to the top and the bottom positions.

Table S3: Experiment 2: Choice Problem Sequence in the Condition 1: Standard Setup

Condition 1: Standard Setup

Trial 1: G^+ vs. G^-

Gamble A: #1-#17 #18 #19-#20

Gamble B: #1-#18 #19 #20

Select the option you prefer:
 (Once you have made your selection, click on the arrow (→) at the bottom right corner to continue)

Gamble A
 Gamble B

Training: G^+ vs. G^-

Before you make more choices, we want you to consider the tickets in the boxes. This **Toggle** button divides some of the rectangles representing tickets with the same prize into individual tickets. This does not change the lotteries, but it makes it much easier to compare the two lotteries. For example, even after the split, the top lottery still has tickets numbered #1 to #17 offering \$96 and the bottom lottery also has tickets numbered #1 to #17 offering \$96. Once the lotteries are split, try to observe how one lottery matches or is better on every ticket. This lottery is better.

You should toggle quite a few times, so you can see what is going on. After a number of toggles, the option to select your preferred gamble will appear.

Gamble A: #1-#18 #19 #20

Gamble B: #1-#17 #18 #19-#20

Toggle

When you have finished toggling, select the option you prefer:
 (Once you have made your selection, click on the arrow (→) at the bottom right corner to continue)

Gamble A
 Gamble B

Trial 2: G^+ vs. G^-

Gamble A: #1-#17 #18 #19-#20

Gamble B: #1-#18 #19 #20

Select the option you prefer:
 (Once you have made your selection, click on the arrow (→) at the bottom right corner to continue)

Gamble A
 Gamble B

Trial 3: F^- vs. G^+

Gamble A: #1-#23 #24 #25

Gamble B: #1-#22 #23 #24-#25

Select the option you prefer:
 (Once you have made your selection, click on the arrow (→) at the bottom right corner to continue)

Gamble A
 Gamble B

Trial 4: G^- vs. G^+

Gamble A: #1-#18 #19 #20

Gamble B: #1-#17 #18 #19-#20

Select the option you prefer:
 (Once you have made your selection, click on the arrow (→) at the bottom right corner to continue)

Gamble A
 Gamble B

Trial 5: F^+ vs. G^-

Gamble A: #1-#22 #23 #24-#25

Gamble B: #1-#23 #24 #25

Select the option you prefer:
 (Once you have made your selection, click on the arrow (→) at the bottom right corner to continue)

Gamble A
 Gamble B

Note: The table outlines the sequence of choice problems for Condition 1 in Experiment 2. During the training phase, participants were always asked “Select the option you prefer”, with two response options. In each trial presentation, gambles were randomly allocated to the top and the bottom positions.

Table S4: Experiment 2: Choice Problem Sequence in Condition 2: Probability Focus

Condition 2: Probability Focus

Trial 1: CR vs. DR

Gamble A: #1-#4 #5-#12 #13-#20

98	40	32
----	----	----

Gamble B: #1-#4 #5-#12 #13-#20

58	44	34
----	----	----

Select the option you prefer:

Gamble A
 Gamble B

Which is more likely to yield a better outcome:
(Once you have made your selection, click on the arrow (→) at the bottom right corner to continue.)

Gamble A
 Gamble B

Trial 2: ER vs. FR

Gamble A: #1-#4 #5-#12 #13-#20

98	40	34
----	----	----

Gamble B: #1-#4 #5-#12 #13-#20

58	44	32
----	----	----

Select the option you prefer:

Gamble A
 Gamble B

Which is more likely to yield a better outcome:
(Once you have made your selection, click on the arrow (→) at the bottom right corner to continue.)

Gamble A
 Gamble B

Trial 3: G⁺ vs. G⁻

Gamble A: #1-#17 #18 #19-#20

96	90 12
----	-------

Gamble B: #1-#18 #19 #20

96	14 12
----	-------

Select the option you prefer:

Gamble A
 Gamble B

Which is more likely to yield a better outcome:
(Once you have made your selection, click on the arrow (→) at the bottom right corner to continue.)

Gamble A
 Gamble B

Training: G⁺ vs. G⁻

Before you make more choices, we want you to consider the tickets in the boxes. The **Toggle** button divides some of the rectangles representing tickets with the same prize into individual tickets. This does not change the lotteries, but it makes it much easier to compare the two lotteries. For example, even after the split, the top lottery still has tickets numbered #1 to #17 offering \$96 and the bottom lottery also has tickets numbered #1 to #17 offering \$96. Once the lotteries are split, try to observe how one lottery matches or is better on every ticket. This lottery is better.

You should toggle quite a few times, so you can see what is going on. After a number of toggles, the option to select your preferred gamble will appear.

Gamble A: #1-#18 #19 #20

96	14 12
----	-------

Gamble B: #1-#17 #18 #19-#20

96	90 12
----	-------

Toggle

When you have finished toggling, select the option you prefer:
(Once you have made your selection, click on the arrow (→) at the bottom right corner to continue.)

Gamble A
 Gamble B

Trial 4: G⁺ vs. G⁻

Gamble A: #1-#17 #18 #19-#20

96	90 12
----	-------

Gamble B: #1-#18 #19 #20

96	14 12
----	-------

Select the option you prefer:

Gamble A
 Gamble B

Which is more likely to yield a better outcome:
(Once you have made your selection, click on the arrow (→) at the bottom right corner to continue.)

Gamble A
 Gamble B

Trial 5: CR vs. DR

Gamble A: #1-#4 #5-#12 #13-#20

58	44	34
----	----	----

Gamble B: #1-#4 #5-#12 #13-#20

98	40	32
----	----	----

Select the option you prefer:

Gamble A
 Gamble B

Which is more likely to yield a better outcome:
(Once you have made your selection, click on the arrow (→) at the bottom right corner to continue.)

Gamble A
 Gamble B

Trial 6: ER vs. FR

Gamble A: #1-#4 #5-#12 #13-#20

98	40	34
----	----	----

Gamble B: #1-#4 #5-#12 #13-#20

58	44	32
----	----	----

Select the option you prefer:

Gamble A
 Gamble B

Which is more likely to yield a better outcome:
(Once you have made your selection, click on the arrow (→) at the bottom right corner to continue.)

Gamble A
 Gamble B

Note: The table outlines the sequence of choice problems for Condition 2 in Experiment 2. During the training phase, participants were always asked “Select the option you prefer”, with two response options. In each trial presentation, gambles were randomly allocated to the top and the bottom positions.

Table S5: Experiment 2: Choice Problem Sequence in the Condition 3: Indifference & Equivalence

Condition 3: Indifference & Equivalence

Trial 1: CR vs. DR

Trial 2: ER vs. FR

Trial 3: G⁺ vs. G⁻

Trial 4: G⁺ vs. GS⁺

Training: G⁺ vs. G⁻

Gamble A: #1, #4, #10

Gamble B: #2, #4, #6

Select the option you prefer:

Which is more likely to yield a better outcome:

Gamble A: #1, #4, #10

Gamble B: #2, #4, #6

Select the option you prefer:

Which is more likely to yield a better outcome:

Gamble A: #1, #17, #19, #20

Gamble B: #2, #18, #19, #20

Select the option you prefer:

Which is more likely to yield a better outcome:

Gamble A: #1, #17, #19, #20

Gamble B: #2, #18, #19, #20

Select the option you prefer:

Which is more likely to yield a better outcome:

Before you make more choices, we want you to consider the tickets in the boxes. The **Toggle** button divides some of the rectangles representing tickets with the same price into individual tickets. This does not change the gambles, but it makes it much easier to compare the two gambles. For example, even after the split, the top lottery still has tickets numbered #1 to #17 offering \$16 and the bottom lottery also has tickets numbered #1 to #17 offering \$16. Once the tickets are split, try to observe how one lottery matches or is better on every ticket. This lottery is better.

You should toggle quite a few times, so you can see what is going on. After a number of toggles, the option to select your preferred gamble will appear.

When you have finished toggling, select the option you prefer:

Trial 5: G⁺ vs. G⁻

Trial 6: G⁺ vs. GS⁺

Trial 7: CR vs. DR

Trial 8: ER vs. FR

Gamble A: #1, #18, #19, #20

Gamble B: #2, #17, #19, #20

Select the option you prefer:

Which is more likely to yield a better outcome:

Gamble A: #1, #18, #19, #20

Gamble B: #2, #17, #19, #20

Select the option you prefer:

Which is more likely to yield a better outcome:

Gamble A: #1, #4, #10, #12

Gamble B: #2, #4, #10, #12

Select the option you prefer:

Which is more likely to yield a better outcome:

Gamble A: #1, #4, #10, #12

Gamble B: #2, #4, #10, #12

Select the option you prefer:

Which is more likely to yield a better outcome:

Note: The table outlines the sequence of choice problems for Condition 3 in Experiment 2. During the training phase, participants were always asked “Select the option you prefer”, with two response options. In each trial presentation, gambles were randomly allocated to the top and the bottom positions.

Table S6: Experiment 2: Choice Problem Sequence in the Condition 4: Upfront Training

Condition 4: Upfront Training

Training: G^+ vs. G^-

Before you make more choices, we want you to consider the tickets in the boxes. The **Toggle** button divides some of the rectangles representing tickets with the same prize into individual tickets. This does not change the lotteries, but it makes it much easier to compare the two lotteries. For example, even after the split, the top lottery still has tickets numbered #1 to #17 offering \$96 and the bottom lottery also has tickets numbered #1 to #17 offering \$96. Once the lotteries are split, try to observe how one lottery matches or is better on every ticket. This lottery is better.

You should toggle quite a few times, so you can see what is going on. After a number of toggles, the option to select your preferred gamble will appear.

Gamble A:

#1-#18	#19 #20
96	14 12

Gamble B:

#1-#17	#18 #19-#20
96	90 12

Toggle

When you have finished toggling, select the option you prefer:
 (Once you have made your selection, click on the arrow (→) at the bottom right corner to continue)

Gamble A

Gamble B

Trial 1: G^+ vs. G^-

Gamble A:

#1-#17	#18 #19-#20
96	90 12

Gamble B:

#1-#18	#19 #20
96	14 12

Select the option you prefer:
 (Once you have made your selection, click on the arrow (→) at the bottom right corner to continue)

Gamble A

Gamble B

Note: The table outlines the sequence of choice problems for Condition 4 in Experiment 2. During the training phase, participants were always asked “Select the option you prefer”, with two response options. In each trial presentation, gambles were randomly allocated to the top and the bottom positions.