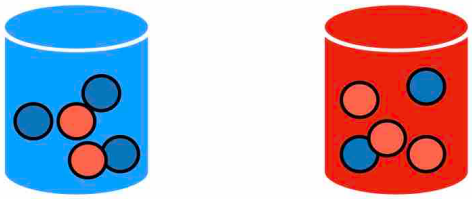
Experimental instructions

The followings are instructions and decision screens in Observe-50 condition. In Observe-80 conditions, only the explanation about the probability of being biased and unbiased advisors (Role A) are different. In Non-Observe conditions, the explanation of Role B observing a ball from the pot is removed. In Non-Observe-100 condition (Study 2), the explanation about the biased type of Role A is removed. In AI advisor condition (Study 2), the explanations are a bit different and thus are shown after the instructions decision screens of Observe-50 condition.

Instruction Page 1

First, pairs of participants are formed randomly, with one assigned Role A and the other Role B. These roles do not change during the task. The two participants will work on a task where they need to guess the color of a pot.

There are two types of pots, as shown in the diagram below.



The blue pot contains three blue balls and two red balls (the pot on the left in the diagram). Therefore, the blue pot has a higher number of blue balls, with a 60% probability of drawing a blue ball and a 40% probability of drawing a red ball.

The red pot contains three red balls and two blue balls (the pot on the right in the diagram). Thus, the red pot has a higher number of red balls, with a 60% probability of drawing a red ball and a 40% probability of drawing a blue ball.

The color of the pot is determined with a 50% probability of being blue and a 50% probability of being red. The color of the pot is decided at the start and does not change during the task.

However, you will not know the color of the pot. Your task is to look at the color of the ball drawn from the pot and guess the color of the pot.

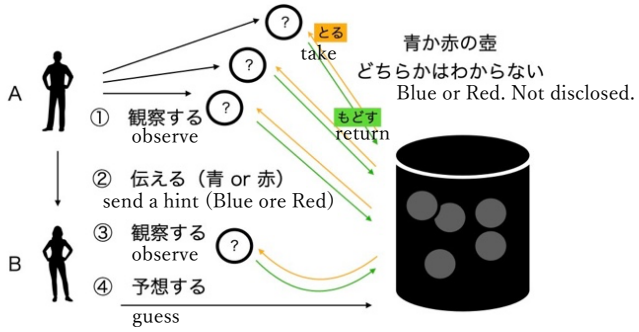
The person in Role A will draw one ball from the pot, check its color, and then return it to the pot. This process will be repeated three times. Since the ball is returned to the pot each time, the probabilities of drawing red or blue balls remain the same for all three draws. After observing the colors of the three balls, Role A will provide a hint to Role B regarding the color of the pot. The hint will be either blue or red.

The person in Role B will first check the hint from Role A. Then, they will draw one ball from the pot, check its color, and return it. After that, they will guess the color of the pot, which can be either blue or red.

To summarize, the sequence of actions is as follows:

Role A observes the color of the ball three times.
Role A communicates a hint to Role B.
Role B observes the color of the ball once.
Role B guesses the color of the pot.

This entire sequence constitutes one transaction, which can be illustrated as shown in the diagram below.



After each transaction, the choices (the hint and the guess) made by both participants will be

disclosed to each other. However, the color of the pot will not be revealed, so it will remain unknown whether the hint or the guess was correct.

This transaction will be repeated 10 times. The color of the pot does not change during this process. The color of the pot will remain the same for rounds 1 to 10.

On the next page, we will explain the additional rewards you can earn.

Instruction Page 2

As previously described, the person in Role A will observe the color of the balls three times and then send a hint to the person in Role B regarding the color of the pot.

There are three types of Role A (Blue, Red, White), and the rules for earning rewards differ by type.

For Type Blue:
In this case, if Role B predicts Blue, Role A earns 10 points; otherwise, they earn 0 points. Since there are 10 decisions, the maximum points Role A can earn is 100.

For Type Red:
In this case, if Role B predicts Red, Role A earns 10 points; otherwise, they earn 0 points. Again, with 10 decisions, the maximum points Role A can earn is 100.

For Type White:
In this case, if Role B predicts the correct pot, Role A earns 10 points; otherwise, they earn 0 points. With 10 decisions, the maximum points Role A can earn is 100.

The type of Role A will be notified at the time of role assignment. The probability of being Type Blue is 25%, Type Red is 25%, and Type White is 50%. The type does not change during the process. Additionally, Role B will not be able to know Role A's type.

Role B will confirm the hint from Role A and then make a prediction about the color of the pot.

The reward rules for Role B are as follows:

If Role B predicts the correct pot, they earn 10 points; if they choose the wrong pot, they earn 0 points. Since there are 10 decisions, the maximum points Role B can earn is 100.

After the 10 exchanges, you will draw a lottery to potentially earn a bonus of 500 yen. The score you earn will determine your probability of winning the 500 yen bonus. For example, if your score is 50 points, your probability of winning the 500 yen is 50%.

The quiz will begin on the next page.

Confirmation Quiz

We will now conduct a pre-quiz consisting of four questions to assess your understanding of the rules. You will receive an additional 50 yen for each correct answer, so please take your time to answer carefully. If needed, you can refer back to the explanation of the experiment at the bottom of the page.

Quiz 1: You two will be divided into Role A and Role B, and you will repeatedly engage in the task of guessing the color of the pot. Please choose one incorrect option from the following statements.

Option 1: You will repeat the task of guessing the pot's color 10 times. (Correct)
Option 2: The roles will not change during the task. (Correct)
Option 3: The color of the pot changes randomly to blue or red each time. (Wrong)

Quiz 2: Role A will take one ball from the pot, check its color, and return it to the pot. This process will be repeated three times. Assuming the pot is blue, choose the correct statement regarding the probabilities of the ball colors.

Option 1: The probability of the ball being blue is 60%. This remains constant regardless of the number of draws. (Correct)
Option 2: The probability of the ball being blue is 80%. This remains constant regardless of the number of draws. (Wrong)
Option 3: The probability of the ball being blue changes with each draw. The probability for the first draw is 80%, the second is 60%, and the third is 40%. (Wrong)

Quiz 3: The scoring rules differ between Role A and Role B. Choose one incorrect option regarding the explanations of each scoring rule.

Option 1: There are multiple types of Role A, and the scoring rules differ for each type. (Correct)
Option 2: Role B earns 10 points for each correct prediction of the pot. (Correct)
Option 3: Role B cannot know the type of Role A (blue, red, white). (Correct)

Option 4: The probability of Role A being of type blue, red, or white is 33.3% for each. (Wrong)

Quiz 4: Select the correct option regarding the scores you will earn.

Option 1: If your score after 10 transactions is 70 points, you will earn a bonus of 700 yen. (Wrong)
Option 2: If your score after 10 transactions is 50 points, the probability of earning a bonus of 500 yen is 50%. (Correct)
Option 3: If your score after 10 transactions is 100 points, you will earn 1000 yen as a reward for answering all questions correctly. (Wrong)

Experimental Implementation Screen

The following screens will repeat every period:

- *Role Notification*
- *Hint Provision (Advisor's Decision Screen)*
- *Guess the color of pot (Guesser's Decision Screen)*
- *Display of the choice result (Feedback Screen)*

Role Notification

Either of the following two are displayed:

--- Role A of Type Red Biased
You are Role A.
Your type is Red. Therefore, you earn 10 points each time B predicts Red. *(This part will be changed according to the actual type of Role A. Hereafter, the explanation will be done for the case of Type Red Advisor)*

Your task is to observe the colors of the balls three times and send a hint about the color of the pot to Role B. However, your screen will only display the counts of blue and red balls you observed.
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or

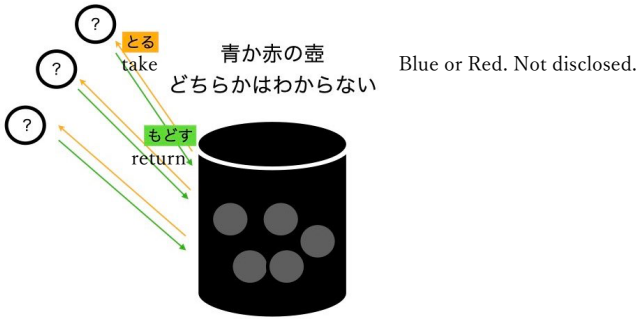
You are Role B.
You earn 10 points each time you correctly predict the pot.

Your task is to confirm the hint from A and the colors of the balls once, then make a prediction about the color of the pot. The hint will only show information indicating either Blue or Red.

Hint Provision

Your type is Red. Therefore, you earn 10 points every time B predicts Red.

You have performed the action of "taking one ball out of the pot, checking the color of that ball, and putting it back into the pot" three times.



As a result, you observed:
1 blue ball and 2 red balls.
Please send a hint to B.

Send Hint
Blue
Red

Next

Guess the Color of the Pot

You received a hint from A indicating Red.

You took out one ball from the pot. The color of the ball was red.

Please guess the color of the pot.

Send Answer

Blue
Red

Next

Display of Choice Result

Role A sent the hint "Red."
Role B predicted "Red."

Proceeding to the next round.

Next

Instruction Page 2 of AI condition

Explanations about the Role A's type is replaced by the following.

Role A will be performed by AI (computer).

The AI will consider all the colors of the balls it has observed so far in this experiment and inform you of the color of the pot that is more probable at that point. If the probabilities are the same, it will randomly choose either blue or red. However, there is a 10% chance that it will send the opposite color from what it originally intended (if it intended Blue, it will send Red, and vice versa).