

# Supplementary material for

DO WE FOLLOW PRIVATE INFORMATION WHEN WE SHOULD?  
LABORATORY EVIDENCE ON NAÏVE HERDING

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Appendices A and B contain translated versions of the instructions in the *Computer-Human* and *Human-Human* treatment, respectively. Instructions were originally in German.

# General Instructions

## Welcome to the experiment!

This is an experiment in decision-making. From now on, we ask you to remain seated quietly at your computer desk. Please do not talk or try to communicate with other participants during the experiment. Participants who intentionally violate this rule will be asked to leave the experiment without being financially compensated.

These instructions describe the first part of the experiment and explain how the decisions you make determine your earnings. If you have any questions during the experiment, please raise your hand and wait for an experimenter to come to you. All of your decisions will be treated in an anonymous manner.

Your earnings will depend partly on your decisions and partly on chance. The earnings from your decisions will be calculated in points. At the end of the experiment, the total amount of points you have earned will be converted to euros at the following rate:

$$\boxed{200 \text{ points} = 1 \text{ Euro}}$$

In addition to the earnings from your decisions, you will receive 2.50 Euros. This payment is to compensate you for showing up on time. At the end of the experiment the total amount of money that you have earned (= your earnings + show-up fee) will be paid to you privately in cash.

## Setting of the experiment

In the experiment, there are two roles: *observed* and *unobserved*.

**7 preprogrammed computer algorithms** will be assigned to the role of *observed*. As the name suggests, a preprogrammed computer algorithm relies on a predefined set of rules to make decisions. Consequently, each *observed* always follows the same set of rules to make decisions. You have the possibility to learn about this set of rules once the experiment is over.

Each of the 8 participants will be assigned to the role of *unobserved*. Each participant and each computer algorithm remains in the same role for the entire duration of the experiment.

The experiment consists of 4 parts. In the first part of the experiment, you will make decisions repeatedly in 3 independent rounds. Each round is conducted in the same way. Details for the first part of the experiment are presented on the next two pages. Instructions for the second, third, and fourth part of the experiment will be shown to you before each of the respective parts begins.

# Instructions for Part 1

## How a round progresses

### 1. The assistant picks either **BLUE** or **GREEN** at random

Each round begins with the assistant picking either the color **BLUE** or the color **GREEN** at random. Each participant has already been instructed about the picking procedure which is as follows:

1. An experimenter shuffles a deck of *20 cards* and lays them down on a table with the back of the cards facing the assistant. **11** cards have a **blue front** and **9** cards have a **green front**.
2. The assistant picks 1 card out of the 20 cards.

If the picked card has a **blue front** then the color picked at random is **BLUE**.

If the picked card has a **green front** then the color picked at random is **GREEN**.

In each round, your task is to guess which color has been picked at random by the assistant.

### 2. Each participant and each computer algorithm draws a colored ball

After a color has been picked at random, the assistant fills *two urns* each with 21 balls, some of them being **blue** balls and the rest being **green** balls. One urn is labeled “OBSERVED” and the other urn is labeled “UNOBSERVED”.

Each *unobserved* draws a ball from the urn labeled “UNOBSERVED”. To do the drawing, an experimenter approaches all participants at their computer desk with the respective urn. Apart from the participant who draws the ball, no other participant sees its color. *After each draw, the ball is returned to the urn before making the next draw.* The composition of the urn labeled “UNOBSERVED” depends both on the color picked at random by the assistant and the index of the round.

#### The urn labeled “UNOBSERVED” in round 1

In case the assistant picked the color **BLUE**, each *unobserved* draws a ball from an urn which contains **14 blue** balls and **7 green** balls.

In case the assistant picked the color **GREEN**, each *unobserved* draws a ball from an urn which contains **7 blue** balls and **14 green** balls.

#### The urn labeled “UNOBSERVED” in round 2

In case the assistant picked the color **BLUE**, each *unobserved* draws a ball from an urn which contains **18 blue** balls and **3 green** balls.

In case the assistant picked the color **GREEN**, each *unobserved* draws a ball from an urn which contains **3 blue** balls and **18 green** balls.

#### The urn labeled “UNOBSERVED” in round 3

In case the assistant picked the color **BLUE**, each *unobserved* draws a ball from an urn which contains **12 blue** balls and **9 green** balls.

In case the assistant picked the color **GREEN**, each *unobserved* draws a ball from an urn which contains **9 blue** balls and **12 green** balls.

While each participant draws a colored ball from the urn labeled “UNOBSERVED”, the assistant draws seven times a ball from the urn labeled “OBSERVED”. *After each draw, the ball is returned to the urn before making the next draw.* Each computer algorithm is informed about the color of one and only one of the seven balls drawn by the assistant. The composition of the urn labeled “OBSERVED” depends only on the color picked at random by the assistant.

#### The urn labeled “OBSERVED”

In case the assistant picked the color **BLUE**, the assistant draws 7 times a ball from an urn which contains **14 blue** and **7 green** balls.

In case the assistant picked the color **GREEN**, the assistant draws 7 times a ball from an urn which contains **7 blue** and **14 green** balls.

### 3. Each participant and each computer algorithm makes a guess

Each round consists of 8 guessing periods. *Observed* make their guesses in a predetermined order and these guesses will be announced by the assistant. All other *observed* will also be informed about the guess of the selected *observed* in a given period.

You also make guesses in a predetermined order, but these guesses will not be announced by the assistant and no computer algorithm will be informed about your guesses. At the beginning of each round, the assistant randomly selects the order in which you make your guesses. To do this, the assistant randomly selects one of you per period for all eight periods. Each participant has already been instructed about the random selection of the order in which you make your guesses at the beginning of the experiment.

**Period 1 to 7.** In each of the first seven periods, *observed* guess which color has been picked at random by the assistant, one per period and according to the predetermined order. In each period, the guess of the *observed* is recorded by the assistant who monitors the computer algorithms. Meanwhile, an experimenter approaches the *unobserved* who, according to the predetermined order, has to guess in the given period and records his/her guess. After the two guesses — one of the selected *observed* and one of the selected *unobserved* — have been recorded, the assistant announces the guess of the *observed*. Guesses of *unobserved* will **not** be announced. Once a computer algorithm made a guess, it does not make any further guess in the current round. Similarly, each *unobserved* makes exactly one guess per round.

**Period 8.** In the last period, an experimenter approaches and records the guess of the only participant who did not guess yet. Since this participant is an *unobserved*, the guess will not be announced.

After each participant and each computer algorithm has made one guess, the assistant informs all participants of the color that was actually picked at the beginning of the round. Once the assistant announced the picked color, the round is over.

## Earnings

In each of the 3 independent rounds, you get paid for the guess you make. If your guess matches the color picked at random by the assistant, you earn 80 points. If your guess does not match the color picked at random by the assistant, you earn 20 points.

At the end of the first part of the experiment, you receive the total amount of points earned in all 3 independent rounds.

## Final remarks

**Record sheets.** At the end of the instructions, you find three record sheets. There is one record sheet for round 1, a second record sheet for round 2 and a third record sheet for round 3. In each round, you must fill out the respective record sheet as specified in the following.

In the description field “Color of my ball” you record the color of the ball you drew. In the row labeled “Guess of the corresponding *observed*” you record the guesses made by the computer algorithms and announced by the assistant in the corresponding period. As an *unobserved* you also record your guess in the period where you were selected, but below the announced guess of the *observed*. Finally, in the description field “Color picked at random by the assistant” you record the color picked at random by the assistant as soon as it is announced at the end of the round.

After these instructions have been read aloud, the first part of the experiment will start.

# Record Sheet — Round 1

Color of my ball: .....

**Guesses:**

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
Guess of the corresponding <i>observed</i>								
Your Guess as <i>unobserved</i>								

- In the second row, record the corresponding guesses of the *observed*.
- In the third row, record your guess in the period where you were selected.

Color picked at random by the assistant: .....

# Record Sheet — Round 2

Color of my ball: .....

Guesses:

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
Guess of the corresponding <i>observed</i>								
Your Guess as <i>unobserved</i>								

- In the second row, record the corresponding guesses of the *observed*.
- In the third row, record your guess in the period where you were selected.

Color picked at random by the assistant: .....

# Record Sheet — Round 3

Color of my ball: .....

Guesses:

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
Guess of the corresponding <i>observed</i>								
Your Guess as <i>unobserved</i>								

- In the second row, record the corresponding guesses of the *observed*.
- In the third row, record your guess in the period where you were selected.

Color picked at random by the assistant: .....

As already mentioned, each participant and each computer algorithm remains in the same role for the entire duration of the experiment. Each computer algorithm remains in the role of an *observed*. Each participant remains in the role of an *unobserved*.

The second part of the experiment consists of 3 independent rounds and each round is conducted in the same way. Like in part 1 of the experiment, in each round *observed* and *unobserved* have to guess the color picked at random by the *assistant*.

The two major differences between part 1 and part 2 of the experiment are:

- 1 Apart from the picking procedure of a color by the assistant, part 2 is entirely computerized. In particular, the computer will prompt you for your guesses and it will keep track of the amount of money you earn.
- 2 In each round, each *unobserved* makes 8 guesses and an *observed* makes between 1 and 7 guesses.

Details for the second part of the experiment are presented on the next screens.



## How a round progresses

Each round begins with the assistant picking either the color **BLUE** or the color **GREEN**. The same picking procedure applies as in part 1 of the experiment.

- 1 An experimenter shuffles a deck of *20 cards* and lays them down on a table with the back of the cards facing the assistant. **11** cards have a **blue front** and **9** cards have a **green front**.
- 2 The assistant picks 1 card out of the 20 cards.

If the picked card has a **blue front** then the color picked at random is **BLUE**.

If the picked card has a **green front** then the color picked at random is **GREEN**.

## How a round progresses

Each round begins with the assistant picking either the color **BLUE** or the color **GREEN**. The same picking procedure applies as in part 1 of the experiment.

- 1 An experimenter shuffles a deck of 20 cards and lays them down on a table with the back of the cards facing the assistant. 11 cards have a **blue front** and 9 cards have a **green front**.
- 2 The assistant picks 1 card out of the 20 cards.

If the picked card has a **blue front** then the color picked at random is **BLUE**.

If the picked card has a **green front** then the color picked at random is **GREEN**.

In each round, your task is to guess which color has been picked at random by the assistant. The next screens describe the guessing procedure, first for the *observed* and then for the *unobserved*.

## Guessing procedure for the observed

Before any guess is made by a participant or a computer algorithm, each *observed* draws a ball from a *virtual urn*. Like the urn labeled "OBSERVED" in part 1 of the experiment, the composition of this virtual urn depends on the color picked at random by the assistant.

If the assistant picked the color **BLUE**, each *observed* draws a ball from a virtual urn with **14 blue** balls and **7 green** balls.

If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** balls and **14 green** balls.

## Guessing procedure for the observed

Before any guess is made by a participant or a computer algorithm, each *observed* draws a ball from a *virtual urn*. Like the urn labeled “OBSERVED” in part 1 of the experiment, the composition of this virtual urn depends on the color picked at random by the assistant.

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If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** balls and **14 green** balls.

Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *observed* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, each computer algorithm randomly selects one of the 21 balls. No computer algorithm can select more than one ball.

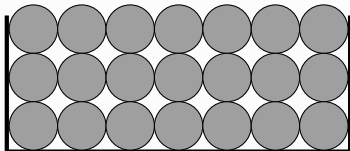
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If the assistant picked the color **BLUE**, each *observed* draws a ball from a virtual urn with **14 blue** balls and **7 green** balls.

If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** balls and **14 green** balls.

Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *observed* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, each computer algorithm randomly selects one of the 21 balls. No computer algorithm can select more than one ball.



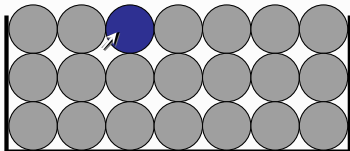
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If the assistant picked the color **BLUE**, each *observed* draws a ball from a virtual urn with **14 blue** balls and **7 green** balls.

If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** balls and **14 green** balls.

Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *observed* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, each computer algorithm randomly selects one of the 21 balls. No computer algorithm can select more than one ball.



In this case, the *observed* drew a blue ball.

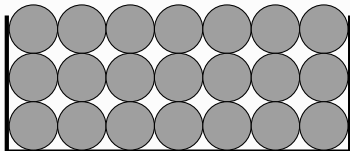
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If the assistant picked the color **BLUE**, each *observed* draws a ball from a virtual urn with **14 blue** balls and **7 green** balls.

If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** balls and **14 green** balls.

Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *observed* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, each computer algorithm randomly selects one of the 21 balls. No computer algorithm can select more than one ball.



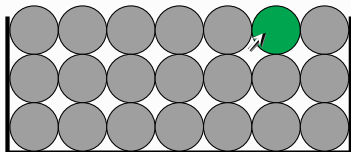
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Before any guess is made by a participant or a computer algorithm, each *observed* draws a ball from a *virtual urn*. Like the urn labeled "OBSERVED" in part 1 of the experiment, the composition of this virtual urn depends on the color picked at random by the assistant.

If the assistant picked the color **BLUE**, each *observed* draws a ball from a virtual urn with **14 blue** balls and **7 green** balls.

If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** balls and **14 green** balls.

Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *observed* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, each computer algorithm randomly selects one of the 21 balls. No computer algorithm can select more than one ball.



In this other case, the *observed* drew a green ball.



## Guessing procedure for the observed

Before any guess is made by a participant or a computer algorithm, each *observed* draws a ball from a *virtual urn*. Like the urn labeled "OBSERVED" in part 1 of the experiment, the composition of this virtual urn depends on the color picked at random by the assistant.

If the assistant picked the color **BLUE**, each *observed* draws a ball from a virtual urn with **14 blue** balls and **7 green** balls.

If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** balls and **14 green** balls.

Like in part 1 of the experiment, each computer algorithm is only informed about the color of its own drawn ball.

## Guessing procedure for the observed

Before any guess is made by a participant or a computer algorithm, each *observed* draws a ball from a *virtual urn*. Like the urn labeled "OBSERVED" in part 1 of the experiment, the composition of this virtual urn depends on the color picked at random by the assistant.

If the assistant picked the color **BLUE**, each *observed* draws a ball from a virtual urn with **14 blue** balls and **7 green** balls.

If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** balls and **14 green** balls.

After each *observed* has drawn a ball from the virtual urn, each of those computer algorithms guesses which color has been picked at random by the assistant. How often each *observed* makes a guess in each round differs from part 1 of the experiment, as explained on the next screen.

**Guessing procedure for the observed**

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

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## Guessing procedure for the observed

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

In **period 1**, all 7 *observed* are asked to guess which color has been picked at random by the assistant.

After all 7 *observed* have guessed, 1 *observed* is selected **at random** by the computer. The guess of the randomly selected *observed* in period 1 is shown to all 7 *observed* and all 8 *unobserved*. The randomly selected *observed* does not make any further guess in the given round. Therefore, there remain only 6 *observed* who can guess in the next period.

## Guessing procedure for the observed

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In **period 1**, all 7 *observed* are asked to guess which color has been picked at random by the assistant.

After all 7 *observed* have guessed, 1 *observed* is selected **at random** by the computer. The guess of the randomly selected *observed* in period 1 is shown to all 7 *observed* and all 8 *unobserved*. The randomly selected *observed* does not make any further guess in the given round. Therefore, there remain only 6 *observed* who can guess in the next period.

In **period 2**, all 6 remaining *observed* are asked again to guess which color has been picked at random by the assistant.

## Guessing procedure for the observed

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

In **period 1**, all 7 *observed* are asked to guess which color has been picked at random by the assistant.

After all 7 *observed* have guessed, 1 *observed* is selected **at random** by the computer. The guess of the randomly selected *observed* in period 1 is shown to all 7 *observed* and all 8 *unobserved*. The randomly selected *observed* does not make any further guess in the given round. Therefore, there remain only 6 *observed* who can guess in the next period.

In **period 2**, all 6 remaining *observed* are asked again to guess which color has been picked at random by the assistant.

After all 6 *observed* have guessed, 1 *observed* is selected **at random** by the computer. The guess of the randomly selected *observed* in period 2 is shown to all 7 *observed* and all 8 *unobserved*. The randomly selected *observed* does not make any further guess in the given round. Therefore, there remain only 5 *observed* who can guess in the next period.

## Guessing procedure for the observed

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

In **period 1**, all 7 *observed* are asked to guess which color has been picked at random by the assistant.

After all 7 *observed* have guessed, 1 *observed* is selected **at random** by the computer. The guess of the randomly selected *observed* in period 1 is shown to all 7 *observed* and all 8 *unobserved*. The randomly selected *observed* does not make any further guess in the given round. Therefore, there remain only 6 *observed* who can guess in the next period.

In **period 2**, all 6 remaining *observed* are asked again to guess which color has been picked at random by the assistant.

After all 6 *observed* have guessed, 1 *observed* is selected **at random** by the computer. The guess of the randomly selected *observed* in period 2 is shown to all 7 *observed* and all 8 *unobserved*. The randomly selected *observed* does not make any further guess in the given round. Therefore, there remain only 5 *observed* who can guess in the next period.

This guessing process continues until . . .



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Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

In **period 1**, all 7 *observed* are asked to guess which color has been picked at random by the assistant.

After all 7 *observed* have guessed, 1 *observed* is selected **at random** by the computer. The guess of the randomly selected *observed* in period 1 is shown to all 7 *observed* and all 8 *unobserved*. The randomly selected *observed* does not make any further guess in the given round. Therefore, there remain only 6 *observed* who can guess in the next period.

In **period 2**, all 6 remaining *observed* are asked again to guess which color has been picked at random by the assistant.

After all 6 *observed* have guessed, 1 *observed* is selected **at random** by the computer. The guess of the randomly selected *observed* in period 2 is shown to all 7 *observed* and all 8 *unobserved*. The randomly selected *observed* does not make any further guess in the given round. Therefore, there remain only 5 *observed* who can guess in the next period.

This guessing process continues until . . .

in **period 7**, the only remaining *observed* is asked to guess which color has been picked at random by the assistant. The guess of this *observed* in period 7 is shown to all 7 *observed* and all 8 *unobserved*. After that, no *observed* makes any further guess in the given round.

## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

In *round 1* the two possible compositions are

If the assistant picked the color **BLUE**, each *unobserved* draws a ball from a virtual urn with **14 blue** and **7 green** balls.

If the assistant picked the color **GREEN**, each *unobserved* draws a ball from a virtual urn with **7 blue** and **14 green** balls.

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Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

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In *round 2* the two possible compositions are

If the assistant picked the color **BLUE**, each *unobserved* draws a ball from a virtual urn with **18 blue** and **3 green** balls.

If the assistant picked the color **GREEN**, each *unobserved* draws a ball from a virtual urn with **3 blue** and **18 green** balls.

## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

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In *round 2* the two possible compositions are

If the assistant picked the color **BLUE**, each *unobserved* draws a ball from a virtual urn with **18 blue** and **3 green** balls.

If the assistant picked the color **GREEN**, each *unobserved* draws a ball from a virtual urn with **3 blue** and **18 green** balls.

In *round 3* the two possible compositions are

If the assistant picked the color **BLUE**, each *unobserved* draws a ball from a virtual urn with **12 blue** and **9 green** balls.

If the assistant picked the color **GREEN**, each *unobserved* draws a ball from a virtual urn with **9 blue** and **12 green** balls.

At the beginning of each round, each *unobserved* will be informed again how the composition of the urn depends on the color picked at random by the assistant in the given round.

## Guessing procedure for the unobserved

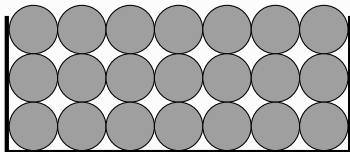
Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *unobserved* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, the *unobserved* points the mouse cursor at the ball and clicks on it. No one can select more than one ball.

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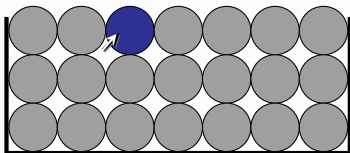
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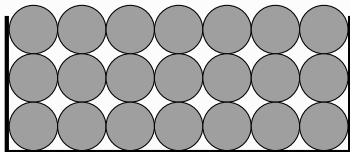
In this case, the *unobserved* drew a blue ball.



## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

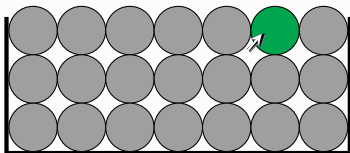
Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *unobserved* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, the *unobserved* points the mouse cursor at the ball and clicks on it. No one can select more than one ball.



## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *unobserved* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, the *unobserved* points the mouse cursor at the ball and clicks on it. No one can select more than one ball.



In this other case, the *unobserved* drew a green ball.

## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

Like in part 1 of the experiment, no participant is informed about the color of the drawn ball of any other participant. Likewise, no computer algorithm is informed about the color of the drawn ball of any participant.

## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

Like in part 1 of the experiment, no participant is informed about the color of the drawn ball of any other participant. Likewise, no computer algorithm is informed about the color of the drawn ball of any participant.

After each *unobserved* has drawn a ball from the virtual urn, each of them guesses which color has been picked at random by the assistant. How often each *unobserved* makes a guess in each round differs from part 1 of the experiment, as explained on the next screen.

## **Guessing procedure for the unobserved**

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

In **each** of the **8** periods, all **8** *unobserved* are asked to guess which color has been picked at random by the assistant.

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

So, in **period 1**, each *unobserved* makes a guess.

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.


So, in **period 1**, each *unobserved* makes a guess.

**Reminder**

If the color picked at random by the assistant is **BLUE**, you drew a ball from an urn which contains **18 blue** balls and **3 green** balls

If the color picked at random by the assistant is **GREEN**, you drew a ball from an urn which contains **3 blue** balls and **18 green** balls

You drew a **blue** ball




**Previous guesses from observed**

In period 1, no observed has guessed yet.

**Your guess**

You guess that the color picked at random by the assistant is

**BLUE**      **GREEN**

 Please click "OK" to validate your guess

**OK**

Decision screen  
in period 1



## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

So, in **period 1**, each *unobserved* makes a guess.

### Reminder

If the color picked at random by the assistant is **BLUE**, you drew a ball from an urn which contains **18 blue** balls and **3 green** balls

If the color picked at random by the assistant is **GREEN**, you drew a ball from an urn which contains **3 blue** balls and **18 green** balls

You drew a **blue** ball



### Previous guesses from observed

In period 1, no observed has guessed yet.

### Your guess

You guess that the color picked at random by the assistant is

**BLUE**

**GREEN**



Please click "OK" to validate your guess

**OK**

The *unobserved* guesses **GREEN**

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

Similarly, in **period 2**, each *unobserved* makes a guess. Note that before making her/his guess, each *unobserved* is informed about the guess made by the *observed* who has been randomly selected in period 1.

## Guessing procedure for the unobserved


Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

Similarly, in **period 2**, each *unobserved* makes a guess. Note that before making her/his guess, each *unobserved* is informed about the guess made by the *observed* who has been randomly selected in period 1.

**Reminder**

If the color picked at random by the assistant is <b>BLUE</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>18 blue</b> and <b>3 green</b> balls	If the color picked at random by the assistant is <b>GREEN</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>3 blue</b> and <b>18 green</b> balls
---	--

You drew a **blue** ball



If the color picked at random by the assistant is **BLUE**, each **observed** drew a ball from an urn which contains **14 blue** and **7 green** balls

If the color picked at random by the assistant is **GREEN**, each **observed** drew a ball from an urn which contains **7 blue** and **14 green** balls

**Previous guesses from observed**

Period 1  
**GREEN**

**Your guess**

You guess that the color picked at random by the assistant is

**BLUE**      **GREEN**

Decision screen  
in period 2




Please click "OK" to validate your guess

**OK**

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

Similarly, in **period 2**, each *unobserved* makes a guess. Note that before making her/his guess, each *unobserved* is informed about the guess made by the *observed* who has been randomly selected in period 1.

Reminder	
If the color picked at random by the assistant is <b>BLUE</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>18 blue</b> and <b>3 green</b> balls	If the color picked at random by the assistant is <b>GREEN</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>3 blue</b> and <b>18 green</b> balls
You drew a <b>blue</b> ball 	
If the color picked at random by the assistant is <b>BLUE</b> , each <b>observed</b> drew a ball from an urn which contains <b>14 blue</b> and <b>7 green</b> balls	If the color picked at random by the assistant is <b>GREEN</b> , each <b>observed</b> drew a ball from an urn which contains <b>7 blue</b> and <b>14 green</b> balls
Previous guesses from observed	
Period 1 <b>GREEN</b>	
Your guess	
You guess that the color picked at random by the assistant is	
<b>BLUE</b>	<b>GREEN</b>

The *unobserved* guesses **BLUE**

Please click "OK" to validate your guess

**OK**

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

This process continues until ...

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

This process continues until ...

in **period 8**, each *unobserved* makes a guess and, before making her/his guess, each *unobserved* is informed about the 7 guesses made by the *observed* in the previous periods.

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.


This process continues until ...

in **period 8**, each *unobserved* makes a guess and, before making her/his guess, each *unobserved* is informed about the 7 guesses made by the *observed* in the previous periods.

**Reminder**

If the color picked at random by the assistant is <b>BLUE</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>18 blue</b> and <b>3 green</b> balls	If the color picked at random by the assistant is <b>GREEN</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>3 blue</b> and <b>18 green</b> balls
---	--

You drew a **blue** ball



If the color picked at random by the assistant is <b>BLUE</b> , each <b>observed</b> drew a ball from an urn which contains <b>14 blue</b> and <b>7 green</b> balls	If the color picked at random by the assistant is <b>GREEN</b> , each <b>observed</b> drew a ball from an urn which contains <b>7 blue</b> and <b>14 green</b> balls
---	--

**Previous guesses from observed**

Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7
<b>GREEN</b>	<b>BLUE</b>	<b>GREEN</b>	<b>GREEN</b>	<b>GREEN</b>	<b>GREEN</b>	<b>BLUE</b>

**Your guess**

You guess that the color picked at random by the assistant is

<b>BLUE</b>	<b>GREEN</b>
-------------	--------------

Decision screen  
in period 8



Please click "OK" to validate your guess

OK

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.


This process continues until ...

in **period 8**, each *unobserved* makes a guess and, before making her/his guess, each *unobserved* is informed about the 7 guesses made by the *observed* in the previous periods.

**Reminder**

If the color picked at random by the assistant is <b>BLUE</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>18 blue</b> and <b>3 green</b> balls	If the color picked at random by the assistant is <b>GREEN</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>3 blue</b> and <b>18 green</b> balls
---	--

You drew a **blue** ball



If the color picked at random by the assistant is <b>BLUE</b> , each <b>observed</b> drew a ball from an urn which contains <b>14 blue</b> and <b>7 green</b> balls	If the color picked at random by the assistant is <b>GREEN</b> , each <b>observed</b> drew a ball from an urn which contains <b>7 blue</b> and <b>14 green</b> balls
---	--

**Previous guesses from observed**

Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7
<b>GREEN</b>	<b>BLUE</b>	<b>GREEN</b>	<b>GREEN</b>	<b>GREEN</b>	<b>GREEN</b>	<b>BLUE</b>

**Your guess**

You guess that the color picked at random by the assistant is

BLUE

GREEN

The *unobserved* guesses **GREEN**

Please click "OK" to validate your guess

OK



## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

This process continues until ...

in **period 8**, each *unobserved* makes a guess and, before making her/his guess, each *unobserved* is informed about the 7 guesses made by the *observed* in the previous periods.

**None** of the guesses made by an *unobserved* is revealed to another participant nor a computer algorithm.

**Guessing procedure for the unobserved**

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

To summarize . . .

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

In **each** of the **8** periods, all **8** *unobserved* are asked to guess which color has been picked at random by the assistant.

So, in **period 1**, each *unobserved* makes a guess.

Similarly, in **period 2**, each *unobserved* makes a guess. Note that before making her/his guess, each *unobserved* is informed about the guess made by the *observed* who has been randomly selected in period 1.

This process continues until . . .

in **period 8**, each *unobserved* makes a guess and, before making her/his guess, each *unobserved* is informed about the 7 guesses made by the *observed* in the previous periods.

**None** of the guesses made by an *unobserved* is revealed to another participant nor a computer algorithm.

The round is over after all 8 participants and all 7 computer algorithms have made all their guesses. Once the round is over, participants are informed about their earnings. Earnings are determined as follows:

The round is over after all 8 participants and all 7 computer algorithms have made all their guesses. Once the round is over, participants are informed about their earnings. Earnings are determined as follows:

### **Earnings in each round**

Each participant gets paid only for **one** guess per round. If the guess matches the color picked at random by the assistant, the participant earns 80 points. If the guess does not match the color picked at random by the assistant, the participant earns 20 points.

The round is over after all 8 participants and all 7 computer algorithms have made all their guesses. Once the round is over, participants are informed about their earnings. Earnings are determined as follows:

### **Earnings in each round**

Each participant gets paid only for **one** guess per round. If the guess matches the color picked at random by the assistant, the participant earns 80 points. If the guess does not match the color picked at random by the assistant, the participant earns 20 points.

Once the round is over, each participant is assigned a period number from 1 to 8. One participant is assigned to period 1, another participant is assigned to period 2, ..., and another participant is assigned to period 8. The assignment of the period numbers is completely random and will be done after each round again. Your guesses do not at all influence the period numbers assigned to you. Each participant gets paid only for the guess made in the assigned period.

The round is over after all 8 participants and all 7 computer algorithms have made all their guesses. Once the round is over, participants are informed about their earnings. Earnings are determined as follows:

### Earnings in each round

Each participant gets paid only for **one** guess per round. If the guess matches the color picked at random by the assistant, the participant earns 80 points. If the guess does not match the color picked at random by the assistant, the participant earns 20 points.

Once the round is over, each participant is assigned a period number from 1 to 8. One participant is assigned to period 1, another participant is assigned to period 2, ..., and another participant is assigned to period 8. The assignment of the period numbers is completely random and will be done after each round again. Your guesses do not at all influence the period numbers assigned to you. Each participant gets paid only for the guess made in the assigned period.

Example 1: Assume that you were assigned to period 4. So, you get paid only for your guess made in period 4.

The round is over after all 8 participants and all 7 computer algorithms have made all their guesses. Once the round is over, participants are informed about their earnings. Earnings are determined as follows:

### Earnings in each round

Each participant gets paid only for **one** guess per round. If the guess matches the color picked at random by the assistant, the participant earns 80 points. If the guess does not match the color picked at random by the assistant, the participant earns 20 points.

Once the round is over, each participant is assigned a period number from 1 to 8. One participant is assigned to period 1, another participant is assigned to period 2, ..., and another participant is assigned to period 8. The assignment of the period numbers is completely random and will be done after each round again. Your guesses do not at all influence the period numbers assigned to you. Each participant gets paid only for the guess made in the assigned period.

Example 2: Assume that you were assigned to period 8. So, you get paid only for your guess made in period 8.



The round is over after all 8 participants and all 7 computer algorithms have made all their guesses. Once the round is over, participants are informed about their earnings. Earnings are determined as follows:

### Earnings in each round

Each participant gets paid only for **one** guess per round. If the guess matches the color picked at random by the assistant, the participant earns 80 points. If the guess does not match the color picked at random by the assistant, the participant earns 20 points.

Once the round is over, each participant is assigned a period number from 1 to 8. One participant is assigned to period 1, another participant is assigned to period 2, ..., and another participant is assigned to period 8. The assignment of the period numbers is completely random and will be done after each round again. Your guesses do not at all influence the period numbers assigned to you. Each participant gets paid only for the guess made in the assigned period.

At the end of part 2, each participant receives the total amount of points earned in all of the 3 independent rounds.

In part 2, each participant and each computer algorithm repeatedly guesses which color has been picked randomly by the assistant in 3 independent rounds. Each round is conducted in the same way:

- 1 The assistant picks at random either the color **BLUE** or the color **GREEN**.
- 2 All participants and all computer algorithms draw colored balls from virtual urns.  
**Observed.** If the assistant picked the color **BLUE**, each *observed* draws a ball from a virtual urn with **14 blue** and **7 green** balls. If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** and **14 green** balls.  
**Unobserved.** Each *unobserved* draws a ball from a virtual urn whose composition depends *both* on the color picked at random by the assistant and the index of the round.
- 3 All participants and all computer algorithms make guesses.  
**Period 1.** All 7 *observed* and all 8 *unobserved* make a guess. One of the *observed* is randomly selected and its guess is shown to all *observed* and all *unobserved*. The selected *observed* makes no further guess.  
**Period 2.** All 6 remaining *observed* and all 8 *unobserved* make a guess. One of the 6 *observed* is randomly selected and its guess is shown to all *observed* and all *unobserved*. The selected *observed* makes no further guess.  
  
This guessing process continues until ...  
**Period 7.** The remaining *observed* and all 8 *unobserved* make a guess. The guess of the only remaining *observed* is shown to all *observed* and all *unobserved*. No *observed* makes any further guess.  
**Period 8.** All 8 *unobserved* make a guess. After all *unobserved* have made their guess, the round is over.

## Additional Instructions for Part 3

Part 2 and 3 of the experiment are conducted in the same way except that

When you draw a ball from the virtual urn, the color of the ball is *not* revealed to you.

Consequently, whenever you are asked to guess the color picked at random by the assistant you make *two guesses*: You make one guess assuming that you drew a blue ball and you make another guess assuming that you drew a green ball.

You are informed about the color of your drawn ball only at the end of the round.

Only the guess you made assuming the color of the ball you drew matters for your earnings.

## Additional Instructions for Part 4

Part 3 and 4 of the experiment are conducted in the same way except that

I. Part 4 consists of *6 independent rounds*.

II. In part 4, you are *not* informed at the beginning of the round how the composition of the virtual urn depends on the color picked at random by the assistant.

Consequently, in each period, you are asked **6 times** to guess the color picked at random by the assistant.

You make two guesses (one for a **blue** ball and one for a **green** ball) assuming that the composition of the urn is one of the following:

In case the assistant picked the color **BLUE**, each *unobserved* draws a ball from an urn which contains **12 blue** balls and **9 green** balls.

In case the assistant picked the color **GREEN**, each *unobserved* draws a ball from an urn which contains **9 blue** balls and **12 green** balls.

You make two guesses (one for a **blue** ball and one for a **green** ball) assuming that the composition of the urn is one of the following:

In case the assistant picked the color **BLUE**, each *unobserved* draws a ball from an urn which contains **14 blue** balls and **7 green** balls.

In case the assistant picked the color **GREEN**, each *unobserved* draws a ball from an urn which contains **7 blue** balls and **14 green** balls.

You make two guesses (one for a **blue** ball and one for a **green** ball) assuming that the composition of the urn is one of the following:

In case the assistant picked the color **BLUE**, each *unobserved* draws a ball from an urn which contains **18 blue** balls and **3 green** balls.

In case the assistant picked the color **GREEN**, each *unobserved* draws a ball from an urn which contains **3 blue** balls and **18 green** balls.

At the end of the round, you are informed which of the three possible combinations of the urn composition was true. *Only the guess you made assuming the true compositions of the urn and the true color of your drawn ball matters for your earnings.*

Please note that the order in which compositions are assumed differs in each round.

III. In part 4, *only one* out of all six rounds is paid.

Once part 4 of the experiment is over, the assistant will roll a six-sided die. If the role of the die yields 1, your total earnings in part 4 correspond to your earnings in round 1 of this part. If the role of the die yields 2, your total earnings in part 4 correspond to your earnings in round 2 of this part. And so on, so that if the role of the die yields 6, your total earnings in part 4 correspond to your earnings in round 6 of this part.

IV. In part 4, you earn *2400* points for a correct guess and *600* points for an incorrect guess.

If your guess matches the color picked at random by the assistant you earn 2400 points. If your guess does not match the color picked at random by the assistant you earn 600 points.

# General Instructions

## Welcome to the experiment!

This is an experiment in decision-making. From now on, we ask you to remain seated quietly at your computer desk. Please do not talk or try to communicate with other participants during the experiment. Participants who intentionally violate this rule will be asked to leave the experiment without being financially compensated.

These instructions describe the first part of the experiment and explain how the decisions you make determine your earnings. If you have any questions during the experiment, please raise your hand and wait for an experimenter to come to you. All of your decisions will be treated in an anonymous manner.

Your earnings will depend partly on your decisions and partly on chance. The earnings from your decisions will be calculated in points. At the end of the experiment, the total amount of points you have earned will be converted to euros at the following rate:

$$200 \text{ points} = 1 \text{ Euro}$$

In addition to the earnings from your decisions, you will receive 2.50 Euros. This payment is to compensate you for showing up on time. At the end of the experiment, the total amount of money that you have earned (= your earnings + show-up fee) will be paid to you privately in cash.

## Setting of the experiment

In the experiment, there are two roles: *observed* and *unobserved*. 7 participants will be assigned to the role of *observed*. Each of the remaining 8 participants will be assigned to the role of *unobserved*. Each participant remains in the same role for the entire duration of the experiment.

The experiment consists of 4 parts. In the first part of the experiment, you will make decisions repeatedly in 3 independent rounds. Each round is conducted in the same way. Details for the first part of the experiment are presented on the next two pages. Instructions for the second, third, and fourth part of the experiment will be shown to you before each of the respective parts begins.

# Instructions for Part 1

## How a round progresses

### 1. The assistant picks either **BLUE** or **GREEN** at random

Each round begins with the assistant picking either the color **BLUE** or the color **GREEN** at random. Each participant has already been instructed about the picking procedure which is as follows:

1. An experimenter shuffles a deck of *20 cards* and lays them down on a table with the back of the cards facing the assistant. **11** cards have a **blue front** and **9** cards have a **green front**.
2. The assistant picks 1 card out of the 20 cards.

If the picked card has a **blue front** then the color picked at random is **BLUE**.

If the picked card has a **green front** then the color picked at random is **GREEN**.

In each round, your task is to guess which color has been picked at random by the assistant.

### 2. Each participant draws a colored ball

After a color has been picked at random, the assistant fills *two urns* each with 21 balls, some of them being **blue** balls and the rest being **green** balls. One urn is labeled “OBSERVED” and the other urn is labeled “UNOBSERVED”.

Each participant draws a ball from one of the two urns. Each *unobserved* draws a ball from the urn labeled “UNOBSERVED”. Each *observed* draws a ball from the urn labeled “OBSERVED”. To do the drawing, two experimenters approach all participants at their computer desk with the respective urn. Apart from the participant who draws the ball, no other participant sees its color. *After each draw, the ball is returned to the urn before making the next draw.*

The composition of the urn labeled “OBSERVED” depends on the color picked at random by the assistant whereas the composition of the urn labeled “UNOBSERVED” depends both on the color picked at random by the assistant and the index of the round, as explained below:

#### The urn labeled “OBSERVED”

In case the assistant picked the color **BLUE**, each *observed* draws a ball from an urn which contains **14 blue** balls and **7 green** balls.

In case the assistant picked the color **GREEN**, each *observed* draws a ball from an urn which contains **7 blue** balls and **14 green** balls.

#### The urn labeled “UNOBSERVED” in round 1

In case the assistant picked the color **BLUE**, each *unobserved* draws a ball from an urn which contains **14 blue** balls and **7 green** balls.

In case the assistant picked the color **GREEN**, each *unobserved* draws a ball from an urn which contains **7 blue** balls and **14 green** balls.

#### The urn labeled “UNOBSERVED” in round 2

In case the assistant picked the color **BLUE**, each *unobserved* draws a ball from an urn which contains **18 blue** balls and **3 green** balls.

In case the assistant picked the color **GREEN**, each *unobserved* draws a ball from an urn which contains **3 blue** balls and **18 green** balls.

#### The urn labeled “UNOBSERVED” in round 3

In case the assistant picked the color **BLUE**, each *unobserved* draws a ball from an urn which contains **12 blue** balls and **9 green** balls.

In case the assistant picked the color **GREEN**, each *unobserved* draws a ball from an urn which contains **9 blue** balls and **12 green** balls.

### 3. Each participant makes a guess

Each round consists of 8 guessing periods. *Observed* make their guesses in a predetermined order and these guesses will be announced by the assistant. Likewise, *unobserved* make their guesses in a predetermined order, but these guesses will not be announced by the assistant.

At the beginning of each round, the assistant randomly selects the order in which *observed* and *unobserved* make their guesses. To do this, the assistant randomly selects one *observed* per period for the first seven periods and one *unobserved* per period for all eight periods. Each participant has already been instructed about the random selection of the order in which *observed* and *unobserved* make their guesses at the beginning of the experiment.

**Period 1 to 7.** In each of the first seven periods, the two randomly selected participants — one *observed* and one *unobserved* — will be approached separately by an experimenter at their respective computer desk. The experimenter records the guess of the *observed* as well as the guess of the *unobserved*. After the two guesses have been recorded, the assistant announces the guess of the *observed*. Guesses of *unobserved* will **not** be announced. Each participant makes exactly **one** guess per round.

**Period 8.** In the last period, an experimenter approaches and records the guess of the only participant who did not guess yet. Since this participant is an *unobserved*, the guess will not be announced.

After every participant has made one guess, the assistant informs all participants of the color that was actually picked at the beginning of the round. Once the assistant announced the picked color, the current round is over.

## Earnings

In each of the 3 independent rounds, you get paid for the guess you make. If your guess matches the color picked at random by the assistant, you earn 80 points. If your guess does not match the color picked at random by the assistant, you earn 20 points.

At the end of the first part of the experiment, you receive the total amount of points earned in all 3 independent rounds.

## Final remarks

**Record sheets.** At the end of the instructions, you find three record sheets. There is one record sheet for round 1, a second record sheet for round 2 and a third record sheet for round 3. In each round, you must fill out the respective record sheet as specified in the following.

In the description field “Color of my ball” you record the color of the ball you drew. In the row labeled “Guess of the corresponding *observed*” you record the guesses announced by the assistant in the corresponding period. These guesses are made by *observed*. If you are an *observed* and you made the announced guess in the current period, you circle your guess to distinguish it from guesses made by the other *observed* in the remaining periods. If you are an *unobserved* you also record your guess in the period where you were selected, but below the announced guess of the *observed*. Finally, in the description field “Color picked at random by the assistant” you record the color picked at random by the assistant as soon as it is announced at the end of the round.

After these instructions have been read aloud, each participant will be informed about her/his role and the first part of the experiment will start.

# Record Sheet — Round 1

Color of my ball: .....

**Guesses:**

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
Guess of the corresponding <i>observed</i>								
Your Guess as <i>unobserved</i>								

- In the second row, record the corresponding guesses of the *observed*. If you are an *observed*, circle the guess in the period where you were selected at random.
- If you are an *unobserved*, record your guess in the period where you were selected in the appropriate column of the third row.
- If you are an *observed*, leave the third row empty.

Color picked at random by the assistant: .....



# Record Sheet — Round 2

Color of my ball: .....

**Guesses:**

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
Guess of the corresponding <i>observed</i>								
Your Guess as <i>unobserved</i>								

- In the second row, record the corresponding guesses of the *observed*. If you are an *observed*, circle the guess in the period where you were selected at random.
- If you are an *unobserved*, record your guess in the period where you were selected in the appropriate column of the third row.
- If you are an *observed*, leave the third row empty.

Color picked at random by the assistant: .....

# Record Sheet — Round 3

Color of my ball: .....

**Guesses:**

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
Guess of the corresponding <i>observed</i>								
Your Guess as <i>unobserved</i>								

- In the second row, record the corresponding guesses of the *observed*. If you are an *observed*, circle the guess in the period where you were selected at random.
- If you are an *unobserved*, record your guess in the period where you were selected in the appropriate column of the third row.
- If you are an *observed*, leave the third row empty.

Color picked at random by the assistant: .....

As already mentioned, each participant remains in the same role for the entire duration of the experiment. If you were assigned to the role of *observed* in part 1 of the experiment, you are also assigned to the role of *observed* in part 2 of the experiment. Similarly, if you were assigned to the role of *unobserved* in part 1 of the experiment, you are also assigned to the role of *unobserved* in part 2 of the experiment.

The second part of the experiment consists of 3 independent rounds and each round is conducted in the same way. Like in part 1 of the experiment, in each round *observed* and *unobserved* have to guess the color picked at random by the *assistant*.

The two major differences between part 1 and part 2 of the experiment are:

- 1 Apart from the picking procedure of a color by the assistant, part 2 is entirely computerized. In particular, the computer will prompt you for your guesses and it will keep track of the amount of money you earn.
- 2 In each round, each *unobserved* makes 8 guesses and an *observed* makes between 1 and 7 guesses.

Details for the second part of the experiment are presented on the next screens.

## How a round progresses

Each round begins with the assistant picking either the color **BLUE** or the color **GREEN**. The same picking procedure applies as in part 1 of the experiment.

- 1 An experimenter shuffles a deck of *20 cards* and lays them down on a table with the back of the cards facing the assistant. **11** cards have a **blue front** and **9** cards have a **green front**.
- 2 The assistant picks 1 card out of the 20 cards.

If the picked card has a **blue front** then the color picked at random is **BLUE**.

If the picked card has a **green front** then the color picked at random is **GREEN**.

## How a round progresses

Each round begins with the assistant picking either the color **BLUE** or the color **GREEN**. The same picking procedure applies as in part 1 of the experiment.

- 1 An experimenter shuffles a deck of 20 cards and lays them down on a table with the back of the cards facing the assistant. 11 cards have a **blue front** and 9 cards have a **green front**.
- 2 The assistant picks 1 card out of the 20 cards.

If the picked card has a **blue front** then the color picked at random is **BLUE**.

If the picked card has a **green front** then the color picked at random is **GREEN**.

In each round, your task is to guess which color has been picked at random by the assistant. The next screens describe the guessing procedure, first for the *observed* and then for the *unobserved*.

## Guessing procedure for the observed

Before any guess is made, each *observed* draws a ball from a *virtual urn*. Like the urn labeled "OBSERVED" in part 1 of the experiment, the composition of this virtual urn depends on the color picked at random by the assistant.

If the assistant picked the color **BLUE**, each *observed* draws a ball from a virtual urn with **14 blue** balls and **7 green** balls.

If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** balls and **14 green** balls.

## Guessing procedure for the observed

Before any guess is made, each *observed* draws a ball from a *virtual urn*. Like the urn labeled “OBSERVED” in part 1 of the experiment, the composition of this virtual urn depends on the color picked at random by the assistant.

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If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** balls and **14 green** balls.

Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *observed* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, the *observed* points the mouse cursor at the ball and clicks on it. No one can select more than one ball.

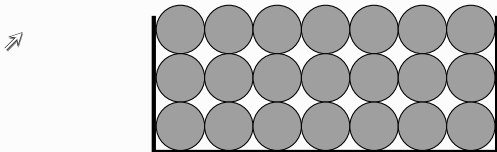
## Guessing procedure for the observed

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If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** balls and **14 green** balls.

Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *observed* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, the *observed* points the mouse cursor at the ball and clicks on it. No one can select more than one ball.





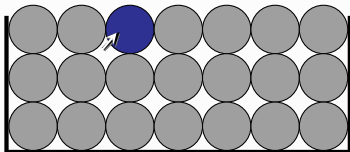
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If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** balls and **14 green** balls.

Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *observed* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, the *observed* points the mouse cursor at the ball and clicks on it. No one can select more than one ball.



In this case, the *observed* drew a blue ball.

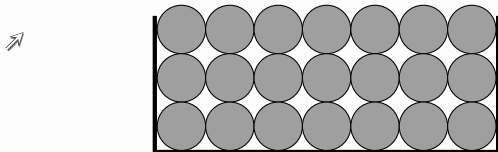
## Guessing procedure for the observed

Before any guess is made, each *observed* draws a ball from a *virtual urn*. Like the urn labeled “OBSERVED” in part 1 of the experiment, the composition of this virtual urn depends on the color picked at random by the assistant.

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Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *observed* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, the *observed* points the mouse cursor at the ball and clicks on it. No one can select more than one ball.



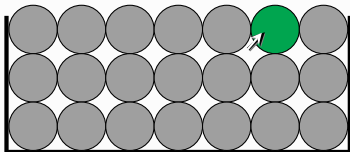
## Guessing procedure for the observed

Before any guess is made, each *observed* draws a ball from a *virtual urn*. Like the urn labeled "OBSERVED" in part 1 of the experiment, the composition of this virtual urn depends on the color picked at random by the assistant.

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Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *observed* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, the *observed* points the mouse cursor at the ball and clicks on it. No one can select more than one ball.



In this other case, the *observed* drew a green ball.

## Guessing procedure for the observed

Before any guess is made, each *observed* draws a ball from a *virtual urn*. Like the urn labeled “OBSERVED” in part 1 of the experiment, the composition of this virtual urn depends on the color picked at random by the assistant.

If the assistant picked the color **BLUE**, each *observed* draws a ball from a virtual urn with **14 blue** balls and **7 green** balls.

If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** balls and **14 green** balls.

Like in part 1 of the experiment, no participant is informed about the color of the drawn ball of any other participant.

## Guessing procedure for the observed

Before any guess is made, each *observed* draws a ball from a *virtual urn*. Like the urn labeled “OBSERVED” in part 1 of the experiment, the composition of this virtual urn depends on the color picked at random by the assistant.

If the assistant picked the color **BLUE**, each *observed* draws a ball from a virtual urn with **14 blue** balls and **7 green** balls.

If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** balls and **14 green** balls.

After each *observed* has drawn a ball from the virtual urn, each of them guesses which color has been picked at random by the assistant. How often each *observed* makes a guess in each round differs from part 1 of the experiment, as explained on the next screen.

**Guessing procedure for the observed**

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

## Guessing procedure for the observed

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In **period 1**, all 7 *observed* are asked to guess which color has been picked at random by the assistant.

## Guessing procedure for the observed

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.


In **period 1**, all 7 *observed* are asked to guess which color has been picked at random by the assistant.

**Reminder**

If the color picked at random by the assistant is **BLUE**, you drew a ball from an urn which contains **14 blue** balls and **7 green** balls

If the color picked at random by the assistant is **GREEN**, you drew a ball from an urn which contains **7 blue** balls and **14 green** balls

You drew a **blue** ball




**Previous guesses from observed**

In period 1, no observed has guessed yet.

**Your guess**

You guess that the color picked at random by the assistant is

**BLUE**      **GREEN**



Please click "OK" to validate your guess

**OK**

Decision screen  
in period 1



## Guessing procedure for the observed

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

In **period 1**, all 7 *observed* are asked to guess which color has been picked at random by the assistant.

### Reminder

If the color picked at random by the assistant is **BLUE**, you drew a ball from an urn which contains **14 blue** balls and **7 green** balls

If the color picked at random by the assistant is **GREEN**, you drew a ball from an urn which contains **7 blue** balls and **14 green** balls

You drew a **blue** ball



### Previous guesses from observed

In period 1, no observed has guessed yet.

### Your guess

You guess that the color picked at random by the assistant is

**BLUE**

**GREEN**



Please click "OK" to validate your guess

**OK**

The *observed* guesses **GREEN**

## Guessing procedure for the observed

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

In **period 1**, all 7 *observed* are asked to guess which color has been picked at random by the assistant.

After all 7 *observed* have guessed, 1 *observed* is selected **at random** by the computer. The guess of the randomly selected *observed* in period 1 is shown to all 7 *observed* and all 8 *unobserved*. The randomly selected *observed* does not make any further guess in the given round. Therefore, there remain only 6 *observed* who can guess in the next period.

## Guessing procedure for the observed

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

In **period 2**, all 6 remaining *observed* are asked again to guess which color has been picked at random by the assistant.

## Guessing procedure for the observed

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.


In **period 2**, all 6 remaining *observed* are asked again to guess which color has been picked at random by the assistant.

**Reminder**

If the color picked at random by the assistant is **BLUE**, each **observed** drew a ball from an urn which contains **14 blue** and **7 green** balls

If the color picked at random by the assistant is **GREEN**, each **observed** drew a ball from an urn which contains **7 blue** and **14 green** balls

You drew a **blue** ball



**Previous guesses from observed**

Period 1

**GREEN**

**Your guess**

You guess that the color picked at random by the assistant is

**BLUE**      **GREEN**

*Please click "OK" to validate your guess*      **OK**

Decision screen  
in period 2

## Guessing procedure for the observed


Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

In **period 2**, all 6 remaining *observed* are asked again to guess which color has been picked at random by the assistant.

**Reminder**

If the color picked at random by the assistant is <b>BLUE</b> , each <b>observed</b> drew a ball from an urn which contains <b>14 blue</b> and <b>7 green</b> balls	If the color picked at random by the assistant is <b>GREEN</b> , each <b>observed</b> drew a ball from an urn which contains <b>7 blue</b> and <b>14 green</b> balls
---	--

You drew a **blue** ball



**Previous guesses from observed**

Period 1

**GREEN**

**Your guess**

You guess that the color picked at random by the assistant is

**BLUE**       **GREEN**

Please click "OK" to validate your guess

The *observed* guesses **BLUE**

## Guessing procedure for the observed

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

In **period 2**, all 6 remaining *observed* are asked again to guess which color has been picked at random by the assistant.

After all 6 *observed* have guessed, 1 *observed* is selected **at random** by the computer. The guess of the randomly selected *observed* in period 2 is shown to all 7 *observed* and all 8 *unobserved*. The randomly selected *observed* does not make any further guess in the given round. Therefore, there remain only 5 *observed* who can guess in the next period.

**Guessing procedure for the observed**

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

This guessing process continues until ...

## Guessing procedure for the observed

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

This guessing process continues until . . .

in **period 7**, the only remaining *observed* is asked to guess which color has been picked at random by the assistant. The guess of this *observed* in period 7 is shown to all 7 *observed* and all 8 *unobserved*. After that, no *observed* makes any further guess in the given round.



## Guessing procedure for the observed

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

This guessing process continues until ...


in **period 7**, the only remaining *observed* is asked to guess which color has been picked at random by the assistant. The guess of this *observed* in period 7 is shown to all 7 *observed* and all 8 *unobserved*. After that, no *observed* makes any further guess in the given round.

**Reminder**

If the color picked at random by the assistant is **BLUE**, each *observed* drew a ball from an urn which contains **14 blue** and **7 green** balls

If the color picked at random by the assistant is **GREEN**, each *observed* drew a ball from an urn which contains **7 blue** and **14 green** balls

You drew a **blue** ball




**Previous guesses from observed**

Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
<b>GREEN</b>	<b>BLUE</b>	<b>GREEN</b>	<b>GREEN</b>	<b>GREEN</b>	<b>GREEN</b>

**Your guess**

You guess that the color picked at random by the assistant is

**BLUE**      **GREEN**



Please click "OK" to validate your guess

**OK**

Decision screen  
in period 7

## Guessing procedure for the observed

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

This guessing process continues until . . .


in **period 7**, the only remaining *observed* is asked to guess which color has been picked at random by the assistant. The guess of this *observed* in period 7 is shown to all 7 *observed* and all 8 *unobserved*. After that, no *observed* makes any further guess in the given round.

**Reminder**

If the color picked at random by the assistant is **BLUE**, each *observed* drew a ball from an urn which contains **14 blue** and **7 green** balls

If the color picked at random by the assistant is **GREEN**, each *observed* drew a ball from an urn which contains **7 blue** and **14 green** balls

You drew a **blue** ball




**Previous guesses from observed**

Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
<b>GREEN</b>	<b>BLUE</b>	<b>GREEN</b>	<b>GREEN</b>	<b>GREEN</b>	<b>GREEN</b>

**Your guess**

You guess that the color picked at random by the assistant is

**BLUE** **GREEN**



Please click "OK" to validate your guess

**OK**

The *observed* guesses **BLUE**

**Guessing procedure for the observed**

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

To summarize ...

## Guessing procedure for the observed

Each of the 3 independent rounds consists of 7 guessing periods for the *observed*.

In **period 1**, all 7 *observed* are asked to guess which color has been picked at random by the assistant.

After all 7 *observed* have guessed, 1 *observed* is selected **at random** by the computer. The guess of the randomly selected *observed* in period 1 is shown to all 7 *observed* and all 8 *unobserved*. The randomly selected *observed* does not make any further guess in the given round. Therefore, there remain only 6 *observed* who can guess in the next period.

In **period 2**, all 6 remaining *observed* are asked again to guess which color has been picked at random by the assistant.

After all 6 *observed* have guessed, 1 *observed* is selected **at random** by the computer. The guess of the randomly selected *observed* in period 2 is shown to all 7 *observed* and all 8 *unobserved*. The randomly selected *observed* does not make any further guess in the given round. Therefore, there remain only 5 *observed* who can guess in the next period.

This guessing process continues until . . .

in **period 7**, the only remaining *observed* is asked to guess which color has been picked at random by the assistant. The guess of this *observed* in period 7 is shown to all 7 *observed* and all 8 *unobserved*. After that, no *observed* makes any further guess in the given round.

## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

In *round 1* the two possible compositions are

If the assistant picked the color **BLUE**, each *unobserved* draws a ball from a virtual urn with **14 blue** and **7 green** balls.

If the assistant picked the color **GREEN**, each *unobserved* draws a ball from a virtual urn with **7 blue** and **14 green** balls.

## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

In *round 1* the two possible compositions are

If the assistant picked the color **BLUE**, each *unobserved* draws a ball from a virtual urn with **14 blue** and **7 green** balls.

If the assistant picked the color **GREEN**, each *unobserved* draws a ball from a virtual urn with **7 blue** and **14 green** balls.

In *round 2* the two possible compositions are

If the assistant picked the color **BLUE**, each *unobserved* draws a ball from a virtual urn with **18 blue** and **3 green** balls.

If the assistant picked the color **GREEN**, each *unobserved* draws a ball from a virtual urn with **3 blue** and **18 green** balls.

## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

In *round 1* the two possible compositions are

If the assistant picked the color **BLUE**, each *unobserved* draws a ball from a virtual urn with **14 blue** and **7 green** balls.

If the assistant picked the color **GREEN**, each *unobserved* draws a ball from a virtual urn with **7 blue** and **14 green** balls.

In *round 2* the two possible compositions are

If the assistant picked the color **BLUE**, each *unobserved* draws a ball from a virtual urn with **18 blue** and **3 green** balls.

If the assistant picked the color **GREEN**, each *unobserved* draws a ball from a virtual urn with **3 blue** and **18 green** balls.

In *round 3* the two possible compositions are

If the assistant picked the color **BLUE**, each *unobserved* draws a ball from a virtual urn with **12 blue** and **9 green** balls.

If the assistant picked the color **GREEN**, each *unobserved* draws a ball from a virtual urn with **9 blue** and **12 green** balls.

At the beginning of each round, each *unobserved* will be informed again how the composition of the urn depends on the color picked at random by the assistant in the given round.



## Guessing procedure for the unobserved

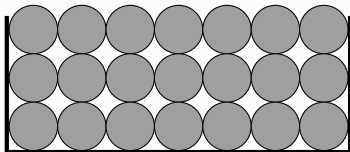
Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *unobserved* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, the *unobserved* points the mouse cursor at the ball and clicks on it. No one can select more than one ball.

## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

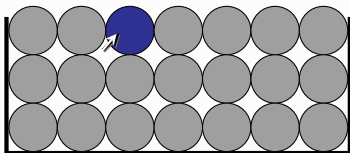
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Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *unobserved* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, the *unobserved* points the mouse cursor at the ball and clicks on it. No one can select more than one ball.

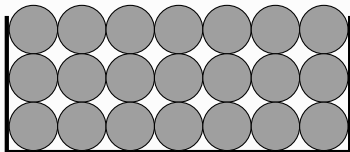


In this case, the *unobserved* drew a blue ball.

## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

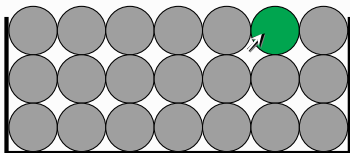
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## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

Before any draw, the balls are shuffled in the virtual urn so that their *location is random*. When drawing the ball, the *unobserved* does not know the exact composition of the urn and the color of the balls is hidden. To draw a ball, the *unobserved* points the mouse cursor at the ball and clicks on it. No one can select more than one ball.



In this other case, the *unobserved* drew a green ball.

## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

Like in part 1 of the experiment, no participant is informed about the color of the drawn ball of any other participant.

## Guessing procedure for the unobserved

Before any guess is made, each *unobserved* draws a ball from a *virtual urn*. Like the urn labeled “UNOBSERVED” in part 1 of the experiment, the composition of this virtual urn depends *both* on the color picked at random by the assistant and the index of the round.

Like in part 1 of the experiment, no participant is informed about the color of the drawn ball of any other participant.

After each *unobserved* has drawn a ball from the virtual urn, each of them guesses which color has been picked at random by the assistant. How often each *unobserved* makes a guess in each round differs from part 1 of the experiment, as explained on the next screen.

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.



## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

In **each** of the **8** periods, all **8** *unobserved* are asked to guess which color has been picked at random by the assistant.

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

So, in **period 1**, each *unobserved* makes a guess.

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.


So, in **period 1**, each *unobserved* makes a guess.

**Reminder**

If the color picked at random by the assistant is **BLUE**, you drew a ball from an urn which contains **18 blue** balls and **3 green** balls

If the color picked at random by the assistant is **GREEN**, you drew a ball from an urn which contains **3 blue** balls and **18 green** balls

You drew a **blue** ball




**Previous guesses from observed**

In period 1, no observed has guessed yet.

**Your guess**

You guess that the color picked at random by the assistant is

**BLUE**      **GREEN**

 Please click "OK" to validate your guess

**OK**

Decision screen  
in period 1

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

So, in **period 1**, each *unobserved* makes a guess.

### Reminder

If the color picked at random by the assistant is **BLUE**, you drew a ball from an urn which contains **18 blue** balls and **3 green** balls

If the color picked at random by the assistant is **GREEN**, you drew a ball from an urn which contains **3 blue** balls and **18 green** balls

You drew a **blue** ball



### Previous guesses from observed

In period 1, no observed has guessed yet.

### Your guess

You guess that the color picked at random by the assistant is

**BLUE**

**GREEN**



Please click "OK" to validate your guess

**OK**

The *unobserved* guesses **GREEN**

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

Similarly, in **period 2**, each *unobserved* makes a guess. Note that before making her/his guess, each *unobserved* is informed about the guess made by the *observed* who has been randomly selected in period 1.

## Guessing procedure for the unobserved


Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

Similarly, in **period 2**, each *unobserved* makes a guess. Note that before making her/his guess, each *unobserved* is informed about the guess made by the *observed* who has been randomly selected in period 1.

**Reminder**

If the color picked at random by the assistant is <b>BLUE</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>18 blue</b> and <b>3 green</b> balls	If the color picked at random by the assistant is <b>GREEN</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>3 blue</b> and <b>18 green</b> balls
---	--

You drew a **blue** ball



If the color picked at random by the assistant is **BLUE**, each **observed** drew a ball from an urn which contains **14 blue** and **7 green** balls

If the color picked at random by the assistant is **GREEN**, each **observed** drew a ball from an urn which contains **7 blue** and **14 green** balls

**Previous guesses from observed**

Period 1  
**GREEN**

**Your guess**

You guess that the color picked at random by the assistant is

**BLUE**      **GREEN**

Decision screen  
in period 2




Please click "OK" to validate your guess

**OK**

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

Similarly, in **period 2**, each *unobserved* makes a guess. Note that before making her/his guess, each *unobserved* is informed about the guess made by the *observed* who has been randomly selected in period 1.

Reminder	
If the color picked at random by the assistant is <b>BLUE</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>18 blue</b> and <b>3 green</b> balls	If the color picked at random by the assistant is <b>GREEN</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>3 blue</b> and <b>18 green</b> balls
You drew a <b>blue</b> ball 	
If the color picked at random by the assistant is <b>BLUE</b> , each <b>observed</b> drew a ball from an urn which contains <b>14 blue</b> and <b>7 green</b> balls	If the color picked at random by the assistant is <b>GREEN</b> , each <b>observed</b> drew a ball from an urn which contains <b>7 blue</b> and <b>14 green</b> balls
Previous guesses from observed	
Period 1 <span style="background-color: #90EE90; padding: 2px;">GREEN</span>	
Your guess	
You guess that the color picked at random by the assistant is <span style="margin-left: 100px;"><span style="background-color: #ADD8E6; padding: 2px;">BLUE</span></span> <span style="margin-left: 50px;"><span style="background-color: #90EE90; padding: 2px;">GREEN</span></span>	

The *unobserved* guesses **BLUE**

Please click "OK" to validate your guess

**OK**

**Guessing procedure for the unobserved**

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

This process continues until ...



## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

This process continues until ...

in **period 8**, each *unobserved* makes a guess and, before making her/his guess, each *unobserved* is informed about the 7 guesses made by the *observed* in the previous periods.

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.


This process continues until ...

in **period 8**, each *unobserved* makes a guess and, before making her/his guess, each *unobserved* is informed about the 7 guesses made by the *observed* in the previous periods.

**Reminder**

If the color picked at random by the assistant is <b>BLUE</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>18 blue</b> and <b>3 green</b> balls	If the color picked at random by the assistant is <b>GREEN</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>3 blue</b> and <b>18 green</b> balls
---	--

You drew a **blue** ball



If the color picked at random by the assistant is <b>BLUE</b> , each <b>observed</b> drew a ball from an urn which contains <b>14 blue</b> and <b>7 green</b> balls	If the color picked at random by the assistant is <b>GREEN</b> , each <b>observed</b> drew a ball from an urn which contains <b>7 blue</b> and <b>14 green</b> balls
---	--

**Previous guesses from observed**

Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7
<b>GREEN</b>	<b>BLUE</b>	<b>GREEN</b>	<b>GREEN</b>	<b>GREEN</b>	<b>GREEN</b>	<b>BLUE</b>

**Your guess**

You guess that the color picked at random by the assistant is

BLUE

GREEN

Decision screen in period 8



Please click "OK" to validate your guess


OK

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

This process continues until ...

in **period 8**, each *unobserved* makes a guess and, before making her/his guess, each *unobserved* is informed about the 7 guesses made by the *observed* in the previous periods.

Reminder	
If the color picked at random by the assistant is <b>BLUE</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>18 blue</b> and <b>3 green</b> balls	If the color picked at random by the assistant is <b>GREEN</b> , each <b>unobserved</b> drew a ball from an urn which contains <b>3 blue</b> and <b>18 green</b> balls
You drew a <b>blue</b> ball 	
If the color picked at random by the assistant is <b>BLUE</b> , each <b>observed</b> drew a ball from an urn which contains <b>14 blue</b> and <b>7 green</b> balls	If the color picked at random by the assistant is <b>GREEN</b> , each <b>observed</b> drew a ball from an urn which contains <b>7 blue</b> and <b>14 green</b> balls

Previous guesses from observed						
Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7
<b>GREEN</b>	<b>BLUE</b>	<b>GREEN</b>	<b>GREEN</b>	<b>GREEN</b>	<b>GREEN</b>	<b>BLUE</b>

Your guess
You guess that the color picked at random by the assistant is <div style="display: inline-block; margin-left: 100px;"> <input type="button" value="BLUE"/> <input checked="" type="button" value="GREEN"/> </div>

The *unobserved* guesses **GREEN**

Please click "OK" to validate your guess

OK

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

This process continues until ...

in **period 8**, each *unobserved* makes a guess and, before making her/his guess, each *unobserved* is informed about the 7 guesses made by the *observed* in the previous periods.

**None** of the guesses made by an *unobserved* is revealed to another participant.

**Guessing procedure for the unobserved**

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

To summarize . . .

## Guessing procedure for the unobserved

Each of the 3 independent rounds consists of 8 guessing periods for the *unobserved*.

In **each** of the **8** periods, all **8** *unobserved* are asked to guess which color has been picked at random by the assistant.

So, in **period 1**, each *unobserved* makes a guess.

Similarly, in **period 2**, each *unobserved* makes a guess. Note that before making her/his guess, each *unobserved* is informed about the guess made by the *observed* who has been randomly selected in period 1.

This process continues until ...

in **period 8**, each *unobserved* makes a guess and, before making her/his guess, each *unobserved* is informed about the 7 guesses made by the *observed* in the previous periods.

**None** of the guesses made by an *unobserved* is revealed to another participant.

The round is over after all 15 participants (the 7 *observed* and the 8 *unobserved*) have made all their guesses. Once the round is over, participants are informed about their earnings. Earnings are determined as follows:

The round is over after all 15 participants (the 7 *observed* and the 8 *unobserved*) have made all their guesses. Once the round is over, participants are informed about their earnings. Earnings are determined as follows:

### **Earnings in each round**

Each participant gets paid only for **one** guess per round. If the guess matches the color picked at random by the assistant, the participant earns 80 points. If the guess does not match the color picked at random by the assistant, the participant earns 20 points.



The round is over after all 15 participants (the 7 *observed* and the 8 *unobserved*) have made all their guesses. Once the round is over, participants are informed about their earnings. Earnings are determined as follows:

### **Earnings in each round**

Each participant gets paid only for **one** guess per round. If the guess matches the color picked at random by the assistant, the participant earns 80 points. If the guess does not match the color picked at random by the assistant, the participant earns 20 points.

**Observed.** Each *observed* gets paid only for the last guess he/she made in the round. Said differently, the guess of an *observed* is paid only in case the guess is shown to all 15 participants.

The round is over after all 15 participants (the 7 *observed* and the 8 *unobserved*) have made all their guesses. Once the round is over, participants are informed about their earnings. Earnings are determined as follows:

### Earnings in each round

Each participant gets paid only for **one** guess per round. If the guess matches the color picked at random by the assistant, the participant earns 80 points. If the guess does not match the color picked at random by the assistant, the participant earns 20 points.

**Observed.** Each *observed* gets paid only for the last guess he/she made in the round. Said differently, the guess of an *observed* is paid only in case the guess is shown to all 15 participants.

Example 1: Assume that you are an *observed* and that you were selected at random in period 1. So, your guess in period 1 was shown to all other participants and you did not make any further guess in the round. Your first guess was also your last guess and you get paid only for this guess in the round.

The round is over after all 15 participants (the 7 *observed* and the 8 *unobserved*) have made all their guesses. Once the round is over, participants are informed about their earnings. Earnings are determined as follows:

### Earnings in each round

Each participant gets paid only for **one** guess per round. If the guess matches the color picked at random by the assistant, the participant earns 80 points. If the guess does not match the color picked at random by the assistant, the participant earns 20 points.

**Observed.** Each *observed* gets paid only for the last guess he/she made in the round. Said differently, the guess of an *observed* is paid only in case the guess is shown to all 15 participants.

Example 2: Assume again that you are an *observed*, but this time we assume that you were selected at random in period 3. So, you made a guess in period 1, in period 2 and in period 3. Your guess in period 3 was shown to all other participants and it was also your last guess in the round. Thus, you get paid only for your guess in period 3.

The round is over after all 15 participants (the 7 *observed* and the 8 *unobserved*) have made all their guesses. Once the round is over, participants are informed about their earnings. Earnings are determined as follows:

### Earnings in each round

Each participant gets paid only for **one** guess per round. If the guess matches the color picked at random by the assistant, the participant earns 80 points. If the guess does not match the color picked at random by the assistant, the participant earns 20 points.

**Observed.** Each *observed* gets paid only for the last guess he/she made in the round. Said differently, the guess of an *observed* is paid only in case the guess is shown to all 15 participants.

**Unobserved.** Once the round is over, each of the 8 *unobserved* is assigned a period number from 1 to 8. One *unobserved* is assigned to period 1, another *unobserved* is assigned to period 2, ..., and another *unobserved* is assigned to period 8. The assignment of the period numbers is completely random and will be done after each round again. Your guesses do not at all influence the period numbers assigned to you. Each *unobserved* gets paid only for the guess made in the assigned period.

The round is over after all 15 participants (the 7 *observed* and the 8 *unobserved*) have made all their guesses. Once the round is over, participants are informed about their earnings. Earnings are determined as follows:

### Earnings in each round

Each participant gets paid only for **one** guess per round. If the guess matches the color picked at random by the assistant, the participant earns 80 points. If the guess does not match the color picked at random by the assistant, the participant earns 20 points.

**Observed.** Each *observed* gets paid only for the last guess he/she made in the round. Said differently, the guess of an *observed* is paid only in case the guess is shown to all 15 participants.

**Unobserved.** Once the round is over, each of the 8 *unobserved* is assigned a period number from 1 to 8. One *unobserved* is assigned to period 1, another *unobserved* is assigned to period 2, ..., and another *unobserved* is assigned to period 8. The assignment of the period numbers is completely random and will be done after each round again. Your guesses do not at all influence the period numbers assigned to you. Each *unobserved* gets paid only for the guess made in the assigned period.

Example 1: Assume that you are an *unobserved* and that you were assigned to period 4. So, you get paid only for your guess made in period 4.

The round is over after all 15 participants (the 7 *observed* and the 8 *unobserved*) have made all their guesses. Once the round is over, participants are informed about their earnings. Earnings are determined as follows:

### Earnings in each round

Each participant gets paid only for **one** guess per round. If the guess matches the color picked at random by the assistant, the participant earns 80 points. If the guess does not match the color picked at random by the assistant, the participant earns 20 points.

**Observed.** Each *observed* gets paid only for the last guess he/she made in the round. Said differently, the guess of an *observed* is paid only in case the guess is shown to all 15 participants.

**Unobserved.** Once the round is over, each of the 8 *unobserved* is assigned a period number from 1 to 8. One *unobserved* is assigned to period 1, another *unobserved* is assigned to period 2, ..., and another *unobserved* is assigned to period 8. The assignment of the period numbers is completely random and will be done after each round again. Your guesses do not at all influence the period numbers assigned to you. Each *unobserved* gets paid only for the guess made in the assigned period.

Example 2: Assume again that you are an *unobserved*, but this time we assume that you were assigned to period 8. So, you get paid only for your guess made in period 8.

The round is over after all 15 participants (the 7 *observed* and the 8 *unobserved*) have made all their guesses. Once the round is over, participants are informed about their earnings. Earnings are determined as follows:

### Earnings in each round

Each participant gets paid only for **one** guess per round. If the guess matches the color picked at random by the assistant, the participant earns 80 points. If the guess does not match the color picked at random by the assistant, the participant earns 20 points.

**Observed.** Each *observed* gets paid only for the last guess he/she made in the round. Said differently, the guess of an *observed* is paid only in case the guess is shown to all 15 participants.

**Unobserved.** Once the round is over, each of the 8 *unobserved* is assigned a period number from 1 to 8. One *unobserved* is assigned to period 1, another *unobserved* is assigned to period 2, ..., and another *unobserved* is assigned to period 8. The assignment of the period numbers is completely random and will be done after each round again. Your guesses do not at all influence the period numbers assigned to you. Each *unobserved* gets paid only for the guess made in the assigned period.

At the end of part 2, each participant receives the total amount of points earned in all of the 3 independent rounds.

In part 2, each participant repeatedly guesses which color has been picked randomly by the assistant in 3 independent rounds. Each round is conducted in the same way:

① The assistant picks at random either the color **BLUE** or the color **GREEN**.

② All participants draw colored balls from virtual urns.

**Observed.** If the assistant picked the color **BLUE**, each *observed* draws a ball from a virtual urn with **14 blue** and **7 green** balls. If the assistant picked the color **GREEN**, each *observed* draws a ball from a virtual urn with **7 blue** and **14 green** balls.

**Unobserved.** Each *unobserved* draws a ball from a virtual urn whose composition depends *both* on the color picked at random by the assistant and the index of the round.

③ All participants make guesses.

**Period 1.** All 7 *observed* and all 8 *unobserved* make a guess. One of the *observed* is randomly selected and his/her guess is shown to all other participants. The selected *observed* makes no further guess.

**Period 2.** All 6 remaining *observed* and all 8 *unobserved* make a guess. One of the 6 *observed* is randomly selected and his/her guess is shown to all other participants. The selected *observed* makes no further guess.

This guessing process continues until ...

**Period 7.** The remaining *observed* and all 8 *unobserved* make a guess. The guess of the only remaining *observed* is shown to all other participants. No *observed* makes any further guess.

**Period 8.** All 8 *unobserved* make a guess. After all *unobserved* have made their guess, the round is over.



## Additional Instructions for Part 3

Part 2 and 3 of the experiment are conducted in the same way except that

When you draw a ball from the virtual urn, the color of the ball is *not* revealed to you.

Consequently, whenever you are asked to guess the color picked at random by the assistant you make *two guesses*: You make one guess assuming that you drew a blue ball and you make another guess assuming that you drew a green ball.

Each *observed* is informed about the color of his/her drawn ball after he/she was randomly selected in one of the first seven periods. The guess of the randomly selected *observed* which corresponds to the color of his/her drawn ball is shown to all other *observed* and all 8 *unobserved*. Each *unobserved* is informed about the color of his/her drawn ball only at the end of the round.

Only the guess you made assuming the color of the ball you drew matters for your earnings.

## Additional Instructions for Part 4

Part 3 and 4 of the experiment are conducted in the same way except that

I. Part 4 consists of *6 independent rounds*.

II. In part 4, *unobserved* are *not* informed at the beginning of the round how the composition of the virtual urn depends on the color picked at random by the assistant.

Consequently, in each period, each *unobserved* is asked **6 times** to guess the color picked at random by the assistant.

Each *unobserved* makes two guesses (one for a **blue** ball and one for a **green** ball) assuming that the composition of the urn is one of the following:

In case the assistant picked the color **BLUE**, each *unobserved* draws a ball from an urn which contains **12 blue** balls and **9 green** balls.

In case the assistant picked the color **GREEN**, each *unobserved* draws a ball from an urn which contains **9 blue** balls and **12 green** balls.

Each *unobserved* makes two guesses (one for a **blue** ball and one for a **green** ball) assuming that the composition of the urn is one of the following:

In case the assistant picked the color **BLUE**, each *unobserved* draws a ball from an urn which contains **14 blue** balls and **7 green** balls.

In case the assistant picked the color **GREEN**, each *unobserved* draws a ball from an urn which contains **7 blue** balls and **14 green** balls.

Each *unobserved* makes two guesses (one for a **blue** ball and one for a **green** ball) assuming that the composition of the urn is one of the following:

In case the assistant picked the color **BLUE**, each *unobserved* draws a ball from an urn which contains **18 blue** balls and **3 green** balls.

In case the assistant picked the color **GREEN**, each *unobserved* draws a ball from an urn which contains **3 blue** balls and **18 green** balls.

At the end of the round, each *unobserved* is informed which of the three possible combinations of the urn composition was true. *Only the guess an unobserved made assuming the true compositions of the urn and the true color of his/her drawn ball matters for his/her earnings.*

Please note that the order in which compositions are assumed differs in each round.

III. In part 4, *only one* out of all six rounds is paid.

Once part 4 of the experiment is over, the assistant will roll a six-sided die. If the role of the die yields 1, your total earnings in part 4 correspond to your earnings in round 1 of this part. If the role of the die yields 2, your total earnings in part 4 correspond to your earnings in round 2 of this part. And so on, so that if the role of the die yields 6, your total earnings in part 4 correspond to your earnings in round 6 of this part.

IV. In part 4, you earn *2400* points for a correct guess and *600* points for an incorrect guess.

If your guess matches the color picked at random by the assistant you earn 2400 points. If your guess does not match the color picked at random by the assistant you earn 600 points.