Information Aggregation Under Ambiguity: Theory and Experimental Evidence

Supplementary Appendix

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Contents

1 Experimental Instructions

The purpose of this experimental session is to study how people make decisions in a particular situation. Your earnings will depend upon the decisions you make as well as the decisions that other people make. At the end of the session, you will be paid in cash your total earnings. None of the other participants will be informed of your earnings, and likewise you will not be informed of the earnings of others. Given that nobody will know of each other's identity, all the decisions you make during the experimental session will be anonymous.

For your participation in the experimental session, you will receive an initial payment of 6,000 Experimental Currency Units (ECUs), which will be converted into euros at an exchange rate of 2,000 ECUs equal €1.

The experimental session consists of **3 parts** to be described at the appropriate time.

The instructions are simple. If you have a question, please raise your hand. Aside from these questions, any communication with other participants or looking at other participants' screens is not permitted and will lead to your immediate exclusion from the experimental session.

The instructions are identical to all participants.

1.1 Part 1

In this part of the study, you are asked to choose one of the five options shown below. Regardless of which option you choose, there are two possible outcomes (Outcome A and Outcome B). These outcomes are equally likely for all five options; that is, there is a 50% chance of Outcome A and a 50% chance of Outcome B, just like the flip of a coin. The options differ only in how much each outcome pays. The table below tells you how much you will be paid for each outcome. The computer will randomly choose between Outcome A and Outcome B at the end of the experimental session. You can imagine the computer flipping a virtual coin so that the chance of each outcome is equal. You will only find out your outcome from Part 1 and how much you will be paid for Part 1 at the end of the experimental session. Please choose your option by clicking on a radio button.

Option	Outcome	Payoff	Probabilities
1	A	2,000 ECUs	50%
	B	2,000 ECUs	50%
2	A	1,400 ECUs	50%
	B	3,500 ECUs	50%
3	A	1,000 ECUs	50%
	B	4,500 ECUs	50%
4	A	600 ECUs	50%
	B	5,500 ECUs	50%
5	A	200 ECUs	50%
	B	6,500 ECUs	50%

1.2 Part 2

1.2.1 Red = 30, Green = 30, Blue = 30, Red → High [SEUS0]

Recall that the instructions are identical to all participants.

You are about to participate in an experiment about prediction markets. You will spend the next few minutes learning how to make predictions and how your earnings are calculated. All values are denominated in Experimental Currency Units (ECUs). With the completion of this part, your ECUs will be converted into euros at the exchange rate of 2,000 ECUs equals €1.

In each round, you have at your disposal 1,500 ECUs; that is, in each round you can **only** use your starting 1,500 ECUs. There are 12 rounds of game play. Though for the duration of the round you will be paired with the **same** participant, in every new round, you will be matched with a **different** participant. Within a given round, the pair of participants will take on the roles of traders that take turns (alternate at) predicting the value of the stock. Specifically, **within a given round**, first, Trader 1 will provide his prediction for the value of the stock, then, Trader 2 will provide her prediction for the value of the stock, then, Trader 1 will provide his prediction for the value of the stock, then, Trader 2, and so on and so forth. Whether or not you are Trader 1 or Trader 2 will be determined by a computer draw **at the beginning of each round**. You can imagine the computer flipping a virtual coin so that the chance of each outcome is equal.

How many predictions within a given round will the two traders report? Again, this is determined by a computer draw. Specifically, after the report of each prediction, the computer will draw an integer from 1 to 100 (all inclusive), where each integer has the same probability of being drawn. If the computer draws an integer below or equal to 95, then, there will be one more prediction in the round; otherwise, if the computer draws an integer above 95, then the round ends. Thus, after each prediction, there is 95% chance that there will be one more prediction in the round, and 5% chance that there will be no other prediction and the round will end.

Your prediction for the value of the stock can be any integer from 0 to 100.

To help you decide on your prediction, we will provide next the payoff functions and some information about the value of the stock.

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Payoff Functions

The stock has either **high value** or **low value**.

Your payoff depends on (a) the stock value (high or low), (b) your prediction, and (c) the previous trader's reported prediction.

Specifically:

- When the **value of the stock is high**, your payoff is:

  $0.01[(100 - previous\ trader's\ reported\ prediction)^2 - (100 - your\ prediction)^2]$.

- When the **value of the stock is low**, your payoff is:

  $0.01[(previous\ trader's\ reported\ prediction)^2 - (your\ prediction)^2]$.

Let's look at these payoff functions more closely.

When the value of the stock is high, assuming you just reported, then *your prediction* must **exceed** that of the *previous trader's reported prediction* to make **profits**. Why? $(100 - your\ prediction)^2$ is smaller than $(100 - previous\ trader's\ reported\ prediction)^2$ precisely because *your prediction* is a bigger number than the *previous trader's reported prediction*. Therefore, $0.01[(100 - previous\ trader's\ reported\ prediction)^2 - (100 - your\ prediction)^2] > 0$. Otherwise, when the value of the stock is high, and *your prediction* is **less than** that of the *previous trader's reported prediction*, you will make **losses**.

The opposite is true, when the value of the stock is low. Assuming you just reported, then *your prediction* must **be less than** that of the *previous trader's reported prediction* to make **profits**. Otherwise, when the value of the stock is low, and *your prediction* **exceeds** that of the *previous trader's reported prediction*, you will make **losses**.

To make neither losses nor profits (i.e. a payoff of 0), you simply need to replicate the choice of the *previous trader's reported prediction.*

To calculate the payoff of Trader 1's **very first prediction**, we assume that the *previous trader's reported prediction* is 0. [The initial value of 0 was changed to 50 in the other set of treatments.]

The **round payoff** is the summation of all the payoffs of the trader in the round. **Crucially, the round payoff will be determined at the end of the round, when the stock**

value is revealed to you. Recall further that in the beginning of the round, you have at your disposal 1,500 ECUs. It is possible that based on the payoffs of your predictions in the round, your funds will go down to zero or even negative. If your **round payoff** is a negative number, then, we will zero your round payoff for that round. In the new round, you will be given once again your starting 1,500 ECUs. The **final payoff** is the summation of all the round payoffs of the trader in the 12 rounds played.

In summary, in order to make profits, when the value of the stock is high, *your prediction* must **exceed** that of the *previous trader's reported prediction*, and when the value of the stock is low, *your prediction* must **be less than** that of the *previous trader's reported prediction*.

Information

At the beginning of each round a colored ball (red, green, or blue) is drawn by the computer from a virtual urn. The color of the drawn ball will determine the value of the stock; that is, whether the stock has a **high value** or a **low value**. Furthermore, the color of the ball will **not be revealed to you until the end of the round.**

The virtual urn contains 90 balls: 30 red balls, 30 green balls, and 30 blue balls.

- If the drawn ball is red, then the stock value is high.

- If the drawn ball is green, then the stock value is low.

- If the drawn ball is blue, then the stock value is again low.

Importantly, we will provide the two traders some **private** information about the draw. **This information is different across the two traders.**

If the drawn ball is red (hence the value of the stock is high): Trader 1 will be informed that the drawn ball is **not blue**, whereas Trader 2 will be informed that the drawn ball is **not green**.

If the drawn ball is green (hence the value of the stock is low): Trader 1 will be informed that the drawn ball is **not blue**, whereas Trader 2 will be informed that the drawn ball is **green**.

If the drawn ball is blue (hence the value of the stock is low): Trader 1 will be informed that the drawn ball is **blue**, whereas Trader 2 will be informed that the drawn ball is **not green**.

This information is presented in a tabular form.

Ball Drawn	Private Information	
	Trader 1	Trader 2
Red	Not Blue	Not Green
Green	Not Blue	Green
Blue	Blue	Not Green

Recall that the color of the ball (hence whether the stock value is low or high) will be revealed to you at the end of the round. The round payoff will then be determined.

Examples

For all the calculations in the Examples, assume the following.

Payoff Functions
The stock has either **high value** or **low value**.

Your payoff depends on (a) the stock value (high or low), (b) your prediction, and (c) the previous trader's reported prediction.

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Ball Drawn	**Trader 1**	**Trader 2**
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Recall that the color of the ball (hence whether the stock value is low or high) will be revealed to you at the end of the round. The round payoff will then be determined.

1. In the beginning of the round, you, as Trader 2, received private information that the ball is green. Suppose that Trader 1's previous prediction was 50.00, and yours is 60.00. Is the value of the stock low or high? Low What is your payoff for this prediction? −11.00 ECUs

2. In the beginning of the round, you, as Trader 2, received private information that the ball is green. Suppose that Trader 1's previous prediction was 55.00, and yours is 35.00. Is the value of the stock low or high? Low What is your payoff for this prediction? 18.00 ECUs

3. In the beginning of the round, you, as Trader 1, received private information that the ball is blue. Suppose that Trader 2's previous prediction was 67.00, and yours is 72.00. Is the value of the stock low or high? Low What is your payoff for this prediction? −6.95 ECUs

4. In the beginning of the round, you, as Trader 1, received private information that the ball is blue. Suppose that Trader 2's previous prediction was 77.00, and yours is 22.00. Is the value of the stock low or high? Low What is your payoff for this prediction? 54.45 ECUs

Quiz

For the calculations, use the calculator provided in the bottom left portion of this screen. Press the icon and the calculator will become live. To use the scientific calculator, press view and choose the scientific calculator. Provide your numerical answers to two decimal places.

Recall that:

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We provide the two traders with some **private** information about the draw. This information is presented in a tabular form.

| | Private Information | |
Ball Drawn	Trader 1	Trader 2
Red	Not Blue	Not Green
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1. How many rounds of game play are there? 12.00

2. During the duration of the round, you will be matched with the same individual. Yes

3. In each round, you will be matched with the same individual. No

4. To determine whether there will be another prediction in the round, the computer draws integer 27. Is there going to be another prediction in the round? Yes

5. To determine whether there will be another prediction in the round, the computer draws integer 96. Is there going to be another prediction in the round? No

6. The round payoff is determined at the very end of the round, when the value of the stock is revealed to you. Yes

7. If your round payoff turns out to be negative, then, we will zero your round payoff for that round. Yes

8. In the beginning of the round, you, as Trader 1, received private information that the ball is blue. Suppose that Trader 2's previous prediction was 57.00, and yours is 82.00. What is your payoff for this prediction? −34.75 ECUs

9. In the beginning of the round, you, as Trader 2, received private information that the ball is green. Suppose that Trader 1's previous prediction was 57.00, and yours is 85.00. What is your payoff for this prediction? −39.76 ECUs

10. In the beginning of the round, you, as Trader 1, received private information that the ball is not blue. Suppose that Trader 2's previous prediction was 40.00, and yours is also 40.00. What is your payoff for this prediction? 0.00 ECUs

11. In the beginning of the round, you, as Trader 2, received private information that the ball is green. Suppose that Trader 1's previous prediction was 40.00, and yours is 50.00. What is your payoff for this prediction? −9.00 ECUs

12. In the beginning of the round, you, as Trader 1, received private information that the ball is blue. Suppose that your very first prediction is 30.00. What is your payoff for this prediction? −9.00 ECUs [The initial value of 0 was changed to 50 in the other set of treatments, which yields 16.00 ECUs.]

13. Suppose that the color of the ball is revealed to you at the end of the round, and you earned the following payoffs for your predictions within the round: 15.00, −10.00, 25.00, 40.00, 10.00. Recall that in the beginning of each round you are provided with 1,500 ECUs. What is your round payoff? 1,580.00 ECUs

14. Suppose that in the 12 rounds, you earned the following round payoffs: 1,500, 1,000, 2,000, 1,500, 1,000, 1,000, 1,000, 1,000, 1,000, 1,000, 2,000, 2,000. What is your final payoff? 16,000.00 ECUs

15. If you earned 16,000 ECUs in the 12 rounds, your final payoff in euros is what? €8.00

1.2.2 $0 \leq$ **Red** $\leq$ **30,** $20 \leq$ **Green** $\leq$ **70,** $20 \leq$ **Blue** $\leq$ **70, Red** $\rightarrow$ **High [AmbS0]**

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How many predictions within a given round will the two traders report? Again, this is determined by a computer draw. Specifically, after the report of each prediction, the computer will draw an integer from 1 to 100 (all inclusive), where each integer has the same probability of being drawn. If the computer draws an integer below or equal to 95, then, there will be one more prediction in the round; otherwise, if the computer draws an integer above 95, then the round ends. Thus, after each prediction, there is 95% chance that there will be one more prediction in the round, and 5% chance that there will be no other prediction and the round will end.

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To make neither losses nor profits (i.e. a payoff of 0), you simply need to replicate the choice of the *previous trader's reported prediction.*

To calculate the payoff of Trader 1's **very first prediction**, we assume that the *previous trader's reported prediction* is 0. [The initial value of 0 was changed to 50 in the other set of treatments.]

The **round payoff** is the summation of all the payoffs of the trader in the round. **Crucially, the round payoff will be determined at the end of the round, when the stock**

value is revealed to you. Recall further that in the beginning of the round, you have at your disposal 1,500 ECUs. It is possible that based on the payoffs of your predictions in the round, your funds will go down to zero or even negative. If your **round payoff** is a negative number, then, we will zero your round payoff for that round. In the new round, you will be given once again your starting 1,500 ECUs. The **final payoff** is the summation of all the round payoffs of the trader in the 12 rounds played.

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5. To determine whether there will be another prediction in the round, the computer draws integer 96. Is there going to be another prediction in the round? No

6. The round payoff is determined at the very end of the round, when the value of the stock is revealed to you. Yes

7. If your round payoff turns out to be negative, then, we will zero your round payoff for that round. Yes

8. In the beginning of the round, you, as Trader 1, received private information that the ball is blue. Suppose that Trader 2's previous prediction was 57.00, and yours is 82.00. What is your payoff for this prediction? -34.75 ECUs

9. In the beginning of the round, you, as Trader 2, received private information that the ball is green. Suppose that Trader 1's previous prediction was 57.00, and yours is 85.00. What is your payoff for this prediction? -39.76 ECUs

10. In the beginning of the round, you, as Trader 1, received private information that the ball is not blue. Suppose that Trader 2's previous prediction was 40.00, and yours is also 40.00. What is your payoff for this prediction? 0.00 ECUs

11. In the beginning of the round, you, as Trader 2, received private information that the ball is green. Suppose that Trader 1's previous prediction was 40.00, and yours is 50.00. What is your payoff for this prediction? −9.00 ECUs

12. In the beginning of the round, you, as Trader 1, received private information that the ball is blue. Suppose that your very first prediction is 30.00. What is your payoff for this prediction? −9.00 ECUs [The initial value of 0 was changed to 50 in the other set of treatments, which yields 16.00 ECUs.]

13. Suppose that the color of the ball is revealed to you at the end of the round, and you earned the following payoffs for your predictions within the round: 15.00, −10.00, 25.00, 40.00, 10.00. Recall that in the beginning of each round you are provided with 1,500 ECUs. What is your round payoff? 1,580.00 ECUs

14. Suppose that in the 12 rounds, you earned the following round payoffs: 1,500, 1,000, 2,000, 1,500, 1,000, 1,000, 1,000, 1,000, 1,000, 1,000, 2,000, 2,000. What is your final payoff? 16,000.00 ECUs

15. If you earned 16,000 ECUs in the 12 rounds, your final payoff in euros is what? €8.00

1.2.3 Red = 30, Green = 30, Blue = 30, Red & Green → High [SEUStS0]

Recall that the instructions are identical to all participants.

You are about to participate in an experiment about prediction markets. You will spend the next few minutes learning how to make predictions and how your earnings are calculated. All values are denominated in Experimental Currency Units (ECUs). With the completion of this part, your ECUs will be converted into euros at the exchange rate of 2,000 ECUs equals €1.

In each round, you have at your disposal 1,500 ECUs; that is, in each round you can **only** use your starting 1,500 ECUs. There are 12 rounds of game play. Though for the duration of the round you will be paired with the **same** participant, in every new round, you will be matched with a **different** participant. Within a given round, the pair of participants will take on the roles of traders that take turns (alternate at) predicting the value of the stock. Specifically, **within a given round**, first, Trader 1 will provide his prediction for the value of the stock, then, Trader 2 will provide her prediction for the value of the stock, then, Trader 1 will provide his prediction for the value of the stock, then, Trader 2, and so on and so forth. Whether or not you are Trader 1 or Trader 2 will be determined by a computer draw **at the beginning of each round**. You can imagine the computer flipping a virtual coin so that the chance of each outcome is equal.

How many predictions within a given round will the two traders report? Again, this is determined by a computer draw. Specifically, after the report of each prediction, the computer will draw an integer from 1 to 100 (all inclusive), where each integer has the same probability of being drawn. If the computer draws an integer below or equal to 95, then, there will be one more prediction in the round; otherwise, if the computer draws an integer above 95, then the round ends. Thus, after each prediction, there is 95% chance that there will be one more prediction in the round, and 5% chance that there will be no other prediction and the round will end.

Your prediction for the value of the stock can be any integer from 0 to 100.

To help you decide on your prediction, we will provide next the payoff functions and some information about the value of the stock.

Payoff Functions

The stock has either **high value** or **low value**.

Your payoff depends on (a) the stock value (high or low), (b) your prediction, and (c) the previous trader's reported prediction.

Specifically:

- When the **value of the stock is high**, your payoff is:

  $0.01[(100 - previous\ trader's\ reported\ prediction)^2 - (100 - your\ prediction)^2]$.

- When the **value of the stock is low**, your payoff is:

  $0.01[(previous\ trader's\ reported\ prediction)^2 - (your\ prediction)^2]$.

Let's look at these payoff functions more closely.

When the value of the stock is high, assuming you just reported, then *your prediction* must **exceed** that of the *previous trader's reported prediction* to make **profits**. Why? $(100 - your\ prediction)^2$ is smaller than $(100 - previous\ trader's\ reported\ prediction)^2$ precisely because *your prediction* is a bigger number than the *previous trader's reported prediction*. Therefore, $0.01[(100 - previous\ trader's\ reported\ prediction)^2 - (100 - your\ prediction)^2] > 0$. Otherwise, when the value of the stock is high, and *your prediction* is **less than** that of the *previous trader's reported prediction*, you will make **losses**.

The opposite is true, when the value of the stock is low. Assuming you just reported, then *your prediction* must **be less than** that of the *previous trader's reported prediction* to make **profits**. Otherwise, when the value of the stock is low, and *your prediction* **exceeds** that of the *previous trader's reported prediction*, you will make **losses**.

To make neither losses nor profits (i.e. a payoff of 0), you simply need to replicate the choice of the *previous trader's reported prediction*.

To calculate the payoff of Trader 1's **very first prediction**, we assume that the *previous trader's reported prediction* is 0. [The initial value of 0 was changed to 50 in the other set of treatments.]

The **round payoff** is the summation of all the payoffs of the trader in the round. **Crucially, the round payoff will be determined at the end of the round, when the stock**

value is revealed to you. Recall further that in the beginning of the round, you have at your disposal 1,500 ECUs. It is possible that based on the payoffs of your predictions in the round, your funds will go down to zero or even negative. If your **round payoff** is a negative number, then, we will zero your round payoff for that round. In the new round, you will be given once again your starting 1,500 ECUs. The **final payoff** is the summation of all the round payoffs of the trader in the 12 rounds played.

In summary, in order to make profits, when the value of the stock is high, *your prediction* must **exceed** that of the *previous trader's reported prediction*, and when the value of the stock is low, *your prediction* must **be less than** that of the *previous trader's reported prediction.*

Information
At the beginning of each round a colored ball (red, green, or blue) is drawn by the computer from a virtual urn. The color of the drawn ball will determine the value of the stock; that is, whether the stock has a **high value** or a **low value**. Furthermore, the color of the ball will **not be revealed to you until the end of the round.**

The virtual urn contains 90 balls: 30 red balls, 30 green balls, and 30 blue balls.

- If the drawn ball is red, then the stock value is high.

- If the drawn ball is green, then the stock value is again high.

- If the drawn ball is blue, then the stock value is low.

Importantly, we will provide the two traders some **private** information about the draw. **This information is different across the two traders.**

If the drawn ball is red (hence the value of the stock is high): Trader 1 will be informed that the drawn ball is **not blue**, whereas Trader 2 will be informed that the drawn ball is **not green**.

If the drawn ball is green (hence the value of the stock is high): Trader 1 will be informed that the drawn ball is **not blue**, whereas Trader 2 will be informed that the drawn ball is **green**.

If the drawn ball is blue (hence the value of the stock is low): Trader 1 will be informed that the drawn ball is **blue**, whereas Trader 2 will be informed that the drawn ball is **not green**.

This information is presented in a tabular form.

Ball Drawn	Private Information	
	Trader 1	Trader 2
Red	Not Blue	Not Green
Green	Not Blue	Green
Blue	Blue	Not Green

Recall that the color of the ball (hence whether the stock value is low or high) will be revealed to you at the end of the round. The round payoff will then be determined.

Examples

For all the calculations in the Examples, assume the following.

Payoff Functions
The stock has either **high value** or **low value**.

Your payoff depends on (a) the stock value (high or low), (b) your prediction, and (c) the previous trader's reported prediction.

Specifically:

- When the **value of the stock is high**, your payoff is:

  $0.01[(100 - previous\ trader's\ reported\ prediction)^2 - (100 - your\ prediction)^2]$.

- When the **value of the stock is low**, your payoff is:

  $0.01[(previous\ trader's\ reported\ prediction)^2 - (your\ prediction)^2]$.

To make neither losses nor profits (i.e. a payoff of 0), you simply need to replicate the choice of the *previous trader's reported prediction*.

To calculate the payoff of Trader 1's **very first prediction**, we assume that the *previous trader's reported prediction* is 0. [The initial value of 0 was changed to 50 in the other set of treatments.]

The **round payoff** is the summation of all the payoffs of the trader in the round. **Crucially, the round payoff will be determined at the end of the round, when the stock value is revealed to you.** Recall further that in the beginning of the round, you have at your disposal 1,500 ECUs. It is possible that based on the payoffs of your predictions in the round, your funds will go down to zero or even negative. If your **round payoff** is a negative number, then, we will zero your round payoff for that round. In the new round, you will be given once again your starting 1,500 ECUs. The **final payoff** is the summation of all the round payoffs of the trader in the 12 rounds played.

In summary, in order to make profits, when the value of the stock is high, *your prediction* must **exceed** that of the *previous trader's reported prediction*, and when the value of the stock is low, *your prediction* must **be less than** that of the *previous trader's reported prediction.*

Information

At the beginning of each round a colored ball (red, green, or blue) is drawn by the computer from a virtual urn. The color of the drawn ball will determine the value of the stock; that is, whether the stock has a **high value** or a **low value**. Furthermore, the color of the ball will **not be revealed to you until the end of the round.**

The virtual urn contains 90 balls: 30 red balls, 30 green balls, and 30 blue balls.

- If the drawn ball is red, then the stock value is high.

- If the drawn ball is green, then the stock value is again high.

- If the drawn ball is blue, then the stock value is low.

Importantly, we will provide the two traders some **private** information about the draw. **This information is different across the two traders.**

If the drawn ball is red (hence the value of the stock is high): Trader 1 will be informed that the drawn ball is **not blue**, whereas Trader 2 will be informed that the drawn ball is **not green**.

If the drawn ball is green (hence the value of the stock is high): Trader 1 will be informed that the drawn ball is **not blue**, whereas Trader 2 will be informed that the drawn ball is **green**.

If the drawn ball is blue (hence the value of the stock is low): Trader 1 will be informed that the drawn ball is **blue**, whereas Trader 2 will be informed that the drawn ball is **not green**.

This information is presented in a tabular form.

	Private Information	
Ball Drawn	**Trader 1**	**Trader 2**
Red	Not Blue	Not Green
Green	Not Blue	Green
Blue	Blue	Not Green

Recall that the color of the ball (hence whether the stock value is low or high) will be revealed to you at the end of the round. The round payoff will then be determined.

1. In the beginning of the round, you, as Trader 2, received private information that the ball is green. Suppose that Trader 1's previous prediction was 50.00, and yours is 60.00. Is the value of the stock low or high? High What is your payoff for this prediction? 9.00 ECUs

2. In the beginning of the round, you, as Trader 2, received private information that the ball is green. Suppose that Trader 1's previous prediction was 55.00, and yours is 35.00. Is the value of the stock low or high? High What is your payoff for this prediction? −22.00 ECUs

3. In the beginning of the round, you, as Trader 1, received private information that the ball is blue. Suppose that Trader 2's previous prediction was 67.00, and yours is 72.00. Is the value of the stock low or high? Low What is your payoff for this prediction? −6.95 ECUs

4. In the beginning of the round, you, as Trader 1, received private information that the ball is blue. Suppose that Trader 2's previous prediction was 77.00, and yours is 22.00. Is the value of the stock low or high? Low What is your payoff for this prediction? 54.45 ECUs

Quiz

For the calculations, use the calculator provided in the bottom left portion of this screen. Press the icon and the calculator will become live. To use the scientific calculator, press view and choose the scientific calculator. Provide your numerical answers to two decimal places.

Recall that:

- When the **value of the stock is high**, your payoff is:

  $0.01[(100 - previous\ trader's\ reported\ prediction)^2 - (100 - your\ prediction)^2].$

- When the **value of the stock is low**, your payoff is:

  $0.01[(previous\ trader's\ reported\ prediction)^2 - (your\ prediction)^2].$

A colored ball (red, green, or blue) is drawn by the computer from a virtual urn. The color of the drawn ball will determine the value of the stock; that is, whether the stock has a **high value** or a **low value**. The virtual urn contains 90 balls: 30 red balls, 30 green balls, and 30 blue balls.

- If the drawn ball is red, then the stock value is high.

- If the drawn ball is green, then the stock value is again high.

- If the drawn ball is blue, then the stock value is low.

We provide the two traders with some **private** information about the draw. This information is presented in a tabular form.

	Private Information	
Ball Drawn	**Trader 1**	**Trader 2**
Red	Not Blue	Not Green
Green	Not Blue	Green
Blue	Blue	Not Green

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1. How many rounds of game play are there? 12.00

2. During the duration of the round, you will be matched with the same individual. Yes

3. In each round, you will be matched with the same individual. No

4. To determine whether there will be another prediction in the round, the computer draws integer 27. Is there going to be another prediction in the round? Yes

5. To determine whether there will be another prediction in the round, the computer draws integer 96. Is there going to be another prediction in the round? No

6. The round payoff is determined at the very end of the round, when the value of the stock is revealed to you. Yes

7. If your round payoff turns out to be negative, then, we will zero your round payoff for that round. Yes

8. In the beginning of the round, you, as Trader 1, received private information that the ball is blue. Suppose that Trader 2's previous prediction was 57.00, and yours is 82.00. What is your payoff for this prediction? -34.75 ECUs

9. In the beginning of the round, you, as Trader 2, received private information that the ball is green. Suppose that Trader 1's previous prediction was 57.00, and yours is 85.00. What is your payoff for this prediction? 16.24 ECUs

10. In the beginning of the round, you, as Trader 1, received private information that the ball is not blue. Suppose that Trader 2's previous prediction was 40.00, and yours is also 40.00. What is your payoff for this prediction? 0.00 ECUs

11. In the beginning of the round, you, as Trader 2, received private information that the ball is green. Suppose that Trader 1's previous prediction was 40.00, and yours is 50.00. What is your payoff for this prediction? 11.00 ECUs

12. In the beginning of the round, you, as Trader 1, received private information that the ball is blue. Suppose that your very first prediction is 30.00. What is your payoff for this prediction? −9.00 ECUs [The initial value of 0 was changed to 50 in the other set of treatments, which yields 16.00 ECUs.]

13. Suppose that the color of the ball is revealed to you at the end of the round, and you earned the following payoffs for your predictions within the round: 15.00, −10.00, 25.00, 40.00, 10.00. Recall that in the beginning of each round you are provided with 1,500 ECUs. What is your round payoff? 1,580.00 ECUs

14. Suppose that in the 12 rounds, you earned the following round payoffs: 1,500, 1,000, 2,000, 1,500, 1,000, 1,000, 1,000, 1,000, 1,000, 1,000, 2,000, 2,000. What is your final payoff? 16,000.00 ECUs

15. If you earned 16,000 ECUs in the 12 rounds, your final payoff in euros is what? €8.00

1.2.4 $1 \leq$ **Red** $\leq$ **30,** $20 \leq$ **Green** $\leq$ **69,** $20 \leq$ **Blue** $\leq$ **69, Red & Green** $\rightarrow$ **High** [AmbStS0]

Recall that the instructions are identical to all participants.

You are about to participate in an experiment about prediction markets. You will spend the next few minutes learning how to make predictions and how your earnings are calculated. All values are denominated in Experimental Currency Units (ECUs). With the completion of this part, your ECUs will be converted into euros at the exchange rate of 2,000 ECUs equals €1.

In each round, you have at your disposal 1,500 ECUs; that is, in each round you can **only** use your starting 1,500 ECUs. There are 12 rounds of game play. Though for the duration of the round you will be paired with the **same** participant, in every new round, you will be matched with a **different** participant. Within a given round, the pair of participants will take on the roles of traders that take turns (alternate at) predicting the value of the stock. Specifically, **within a given round**, first, Trader 1 will provide his prediction for the value of the stock, then, Trader 2 will provide her prediction for the value of the stock, then, Trader 1 will provide his prediction for the value of the stock, then, Trader 2, and so on and so forth. Whether or not you are Trader 1 or Trader 2 will be determined by a computer draw **at the beginning of each round**. You can imagine the computer flipping a virtual coin so that the chance of each outcome is equal.

How many predictions within a given round will the two traders report? Again, this is determined by a computer draw. Specifically, after the report of each prediction, the computer will draw an integer from 1 to 100 (all inclusive), where each integer has the same probability of being drawn. If the computer draws an integer below or equal to 95, then, there will be one more prediction in the round; otherwise, if the computer draws an integer above 95, then the round ends. Thus, after each prediction, there is 95% chance that there will be one more prediction in the round, and 5% chance that there will be no other prediction and the round will end.

Your prediction for the value of the stock can be any integer from 0 to 100.

To help you decide on your prediction, we will provide next the payoff functions and some information about the value of the stock.

Payoff Functions

The stock has either **high value** or **low value**.

Your payoff depends on (a) the stock value (high or low), (b) your prediction, and (c) the previous trader's reported prediction.

Specifically:

- When the **value of the stock is high**, your payoff is:

  $0.01[(100 - previous\ trader's\ reported\ prediction)^2 - (100 - your\ prediction)^2]$.

- When the **value of the stock is low**, your payoff is:

  $0.01[(previous\ trader's\ reported\ prediction)^2 - (your\ prediction)^2]$.

Let's look at these payoff functions more closely.

When the value of the stock is high, assuming you just reported, then *your prediction* must **exceed** that of the *previous trader's reported prediction* to make **profits**. Why? $(100 - your\ prediction)^2$ is smaller than $(100 - previous\ trader's\ reported\ prediction)^2$ precisely because *your prediction* is a bigger number than the *previous trader's reported prediction*. Therefore, $0.01[(100 - previous\ trader's\ reported\ prediction)^2 - (100 - your\ prediction)^2] > 0$. Otherwise, when the value of the stock is high, and *your prediction* is **less than** that of the *previous trader's reported prediction*, you will make **losses**.

The opposite is true, when the value of the stock is low. Assuming you just reported, then *your prediction* must **be less than** that of the *previous trader's reported prediction* to make **profits**. Otherwise, when the value of the stock is low, and *your prediction* **exceeds** that of the *previous trader's reported prediction*, you will make **losses**.

To make neither losses nor profits (i.e. a payoff of 0), you simply need to replicate the choice of the *previous trader's reported prediction.*

To calculate the payoff of Trader 1's **very first prediction**, we assume that the *previous trader's reported prediction* is 0. [The initial value of 0 was changed to 50 in the other set of treatments.]

The **round payoff** is the summation of all the payoffs of the trader in the round. **Crucially, the round payoff will be determined at the end of the round, when the stock**

value is revealed to you. Recall further that in the beginning of the round, you have at your disposal 1,500 ECUs. It is possible that based on the payoffs of your predictions in the round, your funds will go down to zero or even negative. If your **round payoff** is a negative number, then, we will zero your round payoff for that round. In the new round, you will be given once again your starting 1,500 ECUs. The **final payoff** is the summation of all the round payoffs of the trader in the 12 rounds played.

In summary, in order to make profits, when the value of the stock is high, *your prediction* must **exceed** that of the *previous trader's reported prediction*, and when the value of the stock is low, *your prediction* must **be less than** that of the *previous trader's reported prediction*.

Information

At the beginning of each round a colored ball (red, green, or blue) is drawn by the computer from a virtual urn. The color of the drawn ball will determine the value of the stock; that is, whether the stock has a **high value** or a **low value**. Furthermore, the color of the ball will **not be revealed to you until the end of the round.**

The virtual urn contains 90 balls: between 1 and 30 red balls, between 20 and 69 green balls, and between 20 and 69 blue balls.

- If the drawn ball is red, then the stock value is high.

- If the drawn ball is green, then the stock value is again high.

- If the drawn ball is blue, then the stock value is low.

Importantly, we will provide the two traders some **private** information about the draw. **This information is different across the two traders.**

If the drawn ball is red (hence the value of the stock is high): Trader 1 will be informed that the drawn ball is **not blue**, whereas Trader 2 will be informed that the drawn ball is **not green**.

If the drawn ball is green (hence the value of the stock is high): Trader 1 will be informed that the drawn ball is **not blue**, whereas Trader 2 will be informed that the drawn ball is **green**.

If the drawn ball is blue (hence the value of the stock is low): Trader 1 will be informed that the drawn ball is **blue**, whereas Trader 2 will be informed that the drawn ball is **not green**.

This information is presented in a tabular form.

| | Private Information | |
Ball Drawn	Trader 1	Trader 2
Red	Not Blue	Not Green
Green	Not Blue	Green
Blue	Blue	Not Green

Recall that the color of the ball (hence whether the stock value is low or high) will be revealed to you at the end of the round. The round payoff will then be determined.

Examples

For all the calculations in the Examples, assume the following.

Payoff Functions
The stock has either **high value** or **low value**.

Your payoff depends on (a) the stock value (high or low), (b) your prediction, and (c) the previous trader's reported prediction.

Specifically:

- When the **value of the stock is high**, your payoff is:

  $0.01[(100 - previous\ trader's\ reported\ prediction)^2 - (100 - your\ prediction)^2].$

- When the **value of the stock is low**, your payoff is:

  $0.01[(previous\ trader's\ reported\ prediction)^2 - (your\ prediction)^2].$

To make neither losses nor profits (i.e. a payoff of 0), you simply need to replicate the choice of the *previous trader's reported prediction*.

To calculate the payoff of Trader 1's **very first prediction**, we assume that the *previous trader's reported prediction* is 0. [The initial value of 0 was changed to 50 in the other set of treatments.]

The **round payoff** is the summation of all the payoffs of the trader in the round. **Crucially, the round payoff will be determined at the end of the round, when the stock value is revealed to you.** Recall further that in the beginning of the round, you have at your disposal 1,500 ECUs. It is possible that based on the payoffs of your predictions in the round, your funds will go down to zero or even negative. If your **round payoff** is a negative number, then, we will zero your round payoff for that round. In the new round, you will be given once again your starting 1,500 ECUs. The **final payoff** is the summation of all the round payoffs of the trader in the 12 rounds played.

In summary, in order to make profits, when the value of the stock is high, *your prediction* must **exceed** that of the *previous trader's reported prediction*, and when the value of the stock is low, *your prediction* must **be less than** that of the *previous trader's reported prediction*.

Information

At the beginning of each round a colored ball (red, green, or blue) is drawn by the computer from a virtual urn. The color of the drawn ball will determine the value of the stock; that is, whether the stock has a **high value** or a **low value**. Furthermore, the color of the ball will **not be revealed to you until the end of the round.**

The virtual urn contains 90 balls: between 1 and 30 red balls, between 20 and 69 green balls, and between 20 and 69 blue balls.

- If the drawn ball is red, then the stock value is high.

- If the drawn ball is green, then the stock value is again high.

- If the drawn ball is blue, then the stock value is low.

Importantly, we will provide the two traders some **private** information about the draw. **This information is different across the two traders.**

If the drawn ball is red (hence the value of the stock is high): Trader 1 will be informed that the drawn ball is **not blue**, whereas Trader 2 will be informed that the drawn ball is **not green**.

If the drawn ball is green (hence the value of the stock is high): Trader 1 will be informed that the drawn ball is **not blue**, whereas Trader 2 will be informed that the drawn ball is **green**.

If the drawn ball is blue (hence the value of the stock is low): Trader 1 will be informed that the drawn ball is **blue**, whereas Trader 2 will be informed that the drawn ball is **not green**.

This information is presented in a tabular form.

| | Private Information | |
Ball Drawn	Trader 1	Trader 2
Red	Not Blue	Not Green
Green	Not Blue	Green
Blue	Blue	Not Green

Recall that the color of the ball (hence whether the stock value is low or high) will be revealed to you at the end of the round. The round payoff will then be determined.

1. In the beginning of the round, you, as Trader 2, received private information that the ball is green. Suppose that Trader 1's previous prediction was 50.00, and yours is 60.00. Is the value of the stock low or high? High What is your payoff for this prediction? 9.00 ECUs

2. In the beginning of the round, you, as Trader 2, received private information that the ball is green. Suppose that Trader 1's previous prediction was 55.00, and yours is 35.00. Is the value of the stock low or high? High What is your payoff for this prediction? −22.00 ECUs

3. In the beginning of the round, you, as Trader 1, received private information that the ball is blue. Suppose that Trader 2's previous prediction was 67.00, and yours is 72.00. Is the value of the stock low or high? Low What is your payoff for this prediction? −6.95 ECUs

4. In the beginning of the round, you, as Trader 1, received private information that the ball is blue. Suppose that Trader 2's previous prediction was 77.00, and yours is 22.00. Is the value of the stock low or high? Low What is your payoff for this prediction? 54.45 ECUs

Quiz

For the calculations, use the calculator provided in the bottom left portion of this screen. Press the icon and the calculator will become live. To use the scientific calculator, press view and choose the scientific calculator. Provide your numerical answers to two decimal places.

Recall that:

- When the **value of the stock is high**, your payoff is:

  $0.01[(100 - previous\ trader's\ reported\ prediction)^2 - (100 - your\ prediction)^2]$.

- When the **value of the stock is low**, your payoff is:

  $0.01[(previous\ trader's\ reported\ prediction)^2 - (your\ prediction)^2]$.

A colored ball (red, green, or blue) is drawn by the computer from a virtual urn. The color of the drawn ball will determine the value of the stock; that is, whether the stock has a **high value** or a **low value**. The virtual urn contains 90 balls: between 1 and 30 red balls, between 20 and 69 green balls, and between 20 and 69 blue balls.

- If the drawn ball is red, then the stock value is high.

- If the drawn ball is green, then the stock value is again high.

- If the drawn ball is blue, then the stock value is low.

We provide the two traders with some **private** information about the draw. This information is presented in a tabular form.

	Private Information	
Ball Drawn	**Trader 1**	**Trader 2**
Red	Not Blue	Not Green
Green	Not Blue	Green
Blue	Blue	Not Green

1. How many rounds of game play are there? 12.00

2. During the duration of the round, you will be matched with the same individual. Yes

3. In each round, you will be matched with the same individual. No

4. To determine whether there will be another prediction in the round, the computer draws integer 27. Is there going to be another prediction in the round? Yes

5. To determine whether there will be another prediction in the round, the computer draws integer 96. Is there going to be another prediction in the round? No

6. The round payoff is determined at the very end of the round, when the value of the stock is revealed to you. Yes

7. If your round payoff turns out to be negative, then, we will zero your round payoff for that round. Yes

8. In the beginning of the round, you, as Trader 1, received private information that the ball is blue. Suppose that Trader 2's previous prediction was 57.00, and yours is 82.00. What is your payoff for this prediction? −34.75 ECUs

9. In the beginning of the round, you, as Trader 2, received private information that the ball is green. Suppose that Trader 1's previous prediction was 57.00, and yours is 85.00. What is your payoff for this prediction? 16.24 ECUs

10. In the beginning of the round, you, as Trader 1, received private information that the ball is not blue. Suppose that Trader 2's previous prediction was 40.00, and yours is also 40.00. What is your payoff for this prediction? 0.00 ECUs

11. In the beginning of the round, you, as Trader 2, received private information that the ball is green. Suppose that Trader 1's previous prediction was 40.00, and yours is 50.00. What is your payoff for this prediction? 11.00 ECUs

12. In the beginning of the round, you, as Trader 1, received private information that the ball is blue. Suppose that your very first prediction is 30.00. What is your payoff for this prediction? −9.00 ECUs [The initial value of 0 was changed to 50 in the other set of treatments, which yields 16.00 ECUs.]

13. Suppose that the color of the ball is revealed to you at the end of the round, and you earned the following payoffs for your predictions within the round: 15.00, −10.00, 25.00, 40.00, 10.00. Recall that in the beginning of each round you are provided with 1,500 ECUs. What is your round payoff? 1,580.00 ECUs

14. Suppose that in the 12 rounds, you earned the following round payoffs: 1,500, 1,000, 2,000, 1,500, 1,000, 1,000, 1,000, 1,000, 1,000, 1,000, 2,000, 2,000. What is your final payoff? 16,000.00 ECUs

15. If you earned 16,000 ECUs in the 12 rounds, your final payoff in euros is what? €8.00

1.3 Part 3

In this part of the study, you will complete a questionnaire. The questionnaire asks you to answer some questions about yourself. Please note that your individual data will be kept strictly confidential.

1. What is your age?

2. What is your gender?

Male
Female

3. What is your degree in?