

## Supplement to “The development of randomization and deceptive behavior in mixed strategy games”

(*Quantitative Economics*, Vol. 13, No. 2, May 2022, 825–862)

ISABELLE BROCAS

Department of Economics, University of Southern California and CEPR

JUAN D. CARRILLO

Department of Economics, University of Southern California and CEPR

### ONLINE APPENDIX. SAMPLE OF INSTRUCTIONS (GRADES 2 TO 5)

#### *Farmers and Pirates*

This game has three levels. In each level, you will be playing with a different person in the room. The computer will decide who this person is but you will not know and it is not the point to find out. You will be either a “Farmer” or a “Pirate.” Farmers grow magic flowers. If you are a Farmer, you will see a screen like this (a copy of the slides is provided in Figure 1):

[SLIDE 1]

Your job is to hide the flower on one of the three islands. But, in some islands flowers grow better than in others. If you hide the magic flower in this island, 8 baby flowers will grow. If you hide it in the other island, 4 baby flowers will grow. And in that other, 3 baby flowers will grow. You choose where to hide the flower. To do so, you just need to tap on the island you want the flower to be hidden in. For example, you can hide it in this island.

[SLIDE 2]

You can change your mind as many times as you want. When you are sure of your choice, you need to press OK to lock your choice in.

Now, if you are a Pirate, your goal is to steal the baby flowers. Your screen will say WAIT when the farmer is hiding the flower. When the farmer has decided where to hide the flower, you will see a screen like this.

[SLIDE 3]

---

Isabelle Brocas: [brocas@usc.edu](mailto:brocas@usc.edu)

Juan D. Carrillo: [juandc@usc.edu](mailto:juandc@usc.edu)

You know that in this island, 8 baby flowers can grow, in this other, 4 baby flowers can grow and in this other, 3 baby flowers can grow. Your job is to guess where the farmer hid the flower. When you think you know, you just tap on the island you think the baby flowers are. A red circle appears showing that island.

[SLIDE 4]

You can change your mind as many times as you want. When you are sure of your choice, you press OK to lock it in. But how do you get points in this game? Well, if the Pirate finds the island where the flower was hidden, he steals the baby flowers! And each baby flower is worth one point. If the Pirate does not find it, the Farmer keeps the baby flowers and, again, each baby flower is worth 1 point. So, for example, if the Farmer hides the flower in the island that gives 4 baby flowers and the Pirate finds it, the Pirate gets the 4 baby flowers and the Farmer gets nothing. If he does not find it, then the Farmer keeps the 4 baby flowers and the Pirate gets nothing [LAUNCH THE GAME].

### *Level 1*

This is level 1 of the Farmers and Pirates game. Now, the computer will match you with a person in the room. In this level, you will alternate roles: one time farmer, one time pirate, one time farmer, one time pirate, and you will play many times. You will not know what the other person did each time. Each time you play, you can do the same as before or something different. It is entirely up to you. The computer will tell you at the end of the game how many baby flowers you got. Remember, more baby flowers, more points and more points, more toys in the shop.

Let us start with two pretend matches. These matches do not count for real so you will not get points here. Just use it to practice what you want to do next. If you are a farmer, choose one of the islands, and once you are done, wait. If you are a pirate, wait for the farmer then guess which island has the flower [WAIT].

Let us play a second time, but now with the opposite role. If you were a farmer last time, now you are a pirate, and if you were a pirate, now you are a farmer. Again, this game is not for real. [AFTER THE PRACTICE] Are you ready to play for real now?

[START LEVEL 1] [AT THE END]

Level 1 is finished. You will now see a screen like this.

[SLIDE 5]

It tells you when you were a farmer, how many times you kept the flowers [point to happy face] and how many times you lost the flowers to the pirate [point to sad face]. It also tells you that when you were a pirate, how many times you found the flowers [point to happy

face] and how many times you did not find the flowers [point to sad face]. Finally, it also tells you all the points you have won in this level of the game.

### *Level 2*

OK, now we will move to level 2. The game is the same as before except that now if you are the farmer, you can try to trick the pirate. If you are a farmer, this is what you will see on your screen:

[SLIDE 6]

Just as before, you decide where to hide the flower by tapping on an island. But now, there is another screen on the right. This screen is for you to tell the pirate where you hid the flower. You can tell the truth, or you can lie. It is up to you. When you have decided what to tell the pirate, you just tap on the island you want him to believe the flower is in. A blue circle appears in the island you click.

[SLIDE 7]

Here, for example, this is where I hid the flower, and this is where I said I hid the flower. You can change your mind. When you are sure where you want to hide the flower and what you want to tell the pirate, you press OK.

Now if you are a pirate, you will see a screen that says WAIT while the farmer makes his choice. Then you will see the same as before but also the island that the farmer wants you to believe the flower is in. That island is circled in blue.

[SLIDE 8]

You then need again to guess where the flower is. You may choose to believe the farmer or not. To select an island, you tap on it and, just as before, it gets circled in red.

[SLIDE 9]

Just like before, if the pirate finds the island with the flower, the pirate gets the baby flowers. If the pirate does not find the island with the flower, the farmer keeps the baby flowers.

[LAUNCH THE GAME]

The computer will now match you with another person in the room. Again, you will alternate roles: one time farmer, one time pirate, one time farmer, one time pirate, and you will play many times. Whenever you are the farmer, you can try to trick the pirate or tell the truth. When you are the pirate, you can believe the farmer or not. Each time you play, you can do the same as before or something different. It is entirely up to you.

As before, the computer will tell you only at the end of the game how many baby flowers you got when you were a farmer and how many you got when you were a pirate. Are you ready to play?

[START] [AT THE END]

Level 2 is finished. Just like at the end of level 1, you will see a screen like this.

[SLIDE 10]

It tells you how many times you won as a farmer, how many times you won as a pirate, and your total number of points.

### *Level 3*

Let's move to level 3. In this level, you cannot trick the pirate anymore but you can see what the other person did the last time you played, and so will the other person. In level 3, you will play as a farmer or as a pirate several times in a row. Only after several times you will switch role and play in your new role for several times. Suppose you are the farmer and you have been playing already 3 times as a farmer, you will see a screen like this:

[SLIDE 11]

This screen tells you that you are currently the farmer. On this side, it tells you in which island you hid the flowers each of the 3 times you already played as a farmer and whether you won each time. If you are the pirate, you see a screen like this:

[SLIDE 12]

This screen tells you that you are currently the pirate. On this side, it tells you in which island you looked for the flower each time and whether you won. Do you have any questions? Let us play then. Remember you are not going to change roles every time; you will be always the farmer or always the pirate.

[LAUNCH THE GAME] [AFTER HALF THE MATCHES]

Ok. Now you guys are going to switch roles. If you were a farmer you will now be a pirate and if you were a pirate you will now be a farmer. You will play with the same person.

[AT THE END, SHOW THEM FEEDBACK]

Level 3 is finished. You will see a screen like this.

[SLIDE 13]

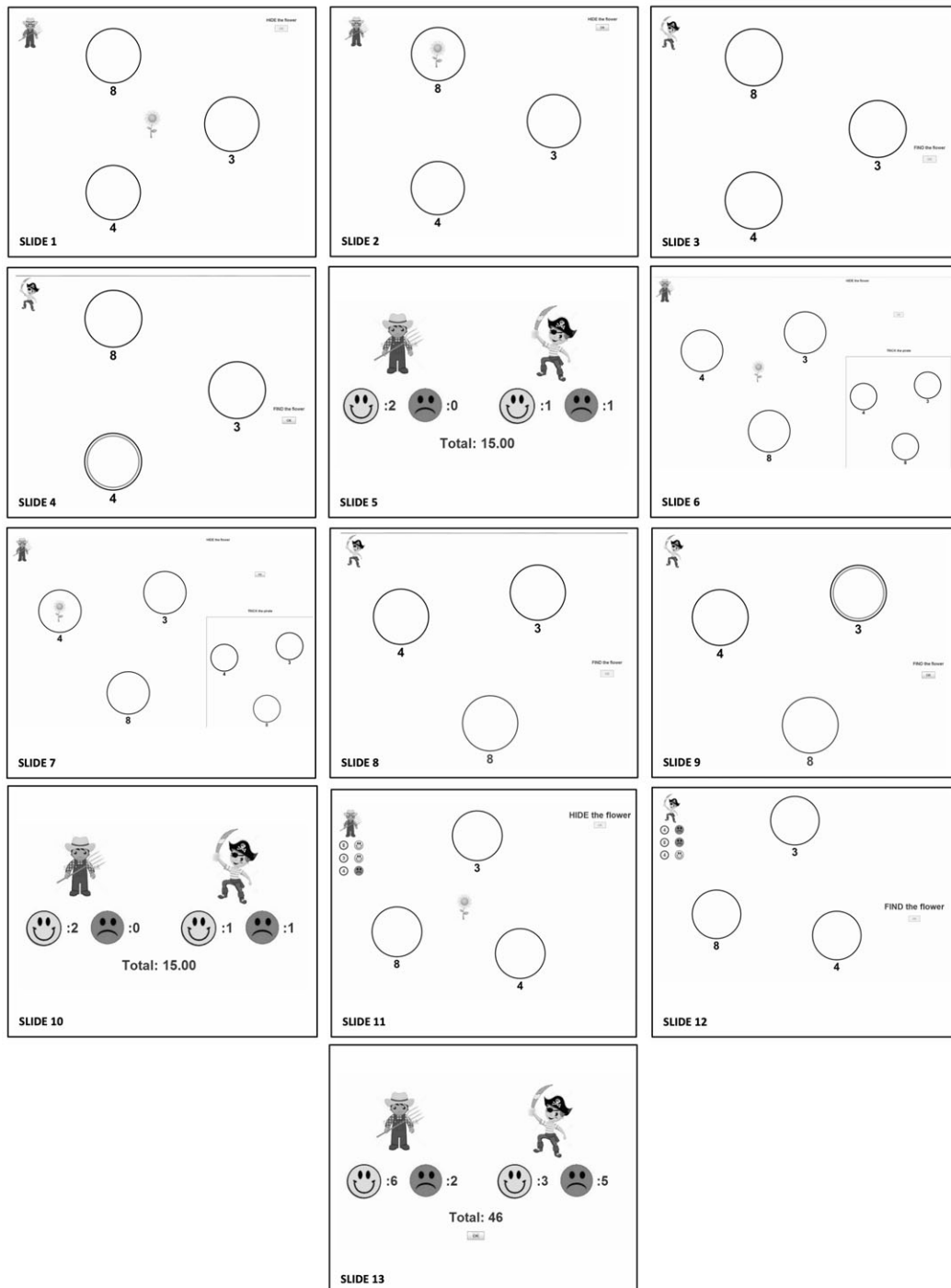


FIGURE 1. Slides projected on screen during instructions.

It tells you how many baby flowers you got as a farmer, how many you got as a pirate and the total number of baby flowers. The computer will now sum up all the points. You can exchange these points for toys in the next room. Did you guys have fun today?

Co-editor Christopher Taber handled this manuscript.

Manuscript received 17 November, 2020; final version accepted 23 August, 2021; available online 28 September, 2021.