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Following Recommendations from Public and Private Correlation Devices in a Game of Chicken*

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Abstract

We consider a specific parametric version of *Chicken* and two different correlation devices, *public* and *private*, with the same expected payoffs in equilibrium, which is also the *best* correlated equilibrium payoff for the game. Despite our choices of parameters (payoffs) in the game, in an experiment with these two correlated equilibria, we find that the rate of "following recommendations" vary significantly within and between two treatments using these devices.

Keywords: Recommendation, Correlated equilibrium, Public device.

JEL Classification Numbers: C72, C92, D83.

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1 INTRODUCTION

Following the seminal work of Aumann (1974, 1987), the concept of correlated equilibrium for any normal form game is well-established in the literature (for a recent survey, see Forges and Ray 2024). In this solution concept, players first receive recommendations from a correlation device, according to a given probability distribution and then they play the game; in a correlated equilibrium, the players follow the recommendations, that is, play the recommended strategies (obediently) in the game. Any convex combination (a "public lottery") over pure Nash equilibrium outcomes of a game can also be viewed as a correlation device and trivially becomes a correlated equilibrium for that game.

There is a literature on experiments with correlated equilibrium that essentially asks whether recommended strategies are played in games (Moreno and Wooders 1998; Cason and Sharma 2007; Duffy and Feltovich 2010; Duffy *et al.* 2017; Anbarci *et al.* 2018; Arifovic *et al.* 2019, Cason *et al.* 2020; Friedman *et al.* 2022; Cason *et al.* 2025). We learn from this literature that individuals do usually follow recommendations from a correlation device that is a correlated equilibrium, however, do not follow when the device is not an equilibrium.

The issues of multiple pure Nash equilibria and thus coordination in games have also been one of the major themes of research in experimental economics (Cooper *et al.* 1989, 1990; Van Huyck *et al.* 1990, 1991). In the last two decades, a growing literature of experimental research suggests that in games with multiple symmetric equilibria, individuals indeed are able to coordinate if they are helped to do so using some suitably chosen scheme, including public lottery.

We, in this paper, take this connection between two strands of literature (on coordination and correlation) further by comparing a public lottery and a correlated equilibrium for a simple symmetric 2 x 2 game.

We compare two different correlation devices to see, if at all, obedience, that is, following recommendations obediently, differ in equilibrium. To do so, we use a 2-person game of Chicken with two pure strategies, namely, X and Y. Our first correlation device is a public lottery with equal probabilities over two pure Nash equilibria of the game, (X, Y) and (Y, X). We formally call this randomised device a *public* correlation device. The second correlation device randomly selects three outcomes of the game, (X, Y), (Y, X) and (Y, Y) with equal probabilities ($\frac{1}{3}$), where the outcome, (Y, Y) is not a Nash equilibrium, however, can be viewed as a "cooperative" outcome. This device thereby involves a simple posterior distribution (of equal probabilities) given the recommendation Y for an individual over the two possible recommendations for the other individual. We call this device the *private* correlation device.

These two correlation devices and the game have already been used in the above-mentioned literature that analyses players' behaviour of following recommendations from different types of correlation devices. However, the existing literature does not provide a clear answer to the question whether these devices "perform" equally well or not. This is mainly because the literature lacks a robust set up to ask this specific question. Moreover, these papers do not offer any specific justification behind the choices of the payoffs used in experiments. Therefore, not surprisingly perhaps, the findings reported in these papers regarding different rates of following recommendations, involving different conditional expected payoffs, are not conclusive.

The contribution of this paper is thus two fold. Unlike other papers in the literature, we first choose the payoffs in our game (of Chicken) based on some theoretical criteria so that the comparisons are in level playing-field. We consider two correlated equilibria (based on the public and private devices) with the same expected payoffs (when recommendations are followed) that also are the "best" correlated equilibria in terms of *ex ante* expected payoffs for the game of Chicken we consider. Moreover, for the private device, we maintain the same conditional expected gain from following recommendation for both recommendations (X and Y). Second, with our chosen payoffs in the game, we thereby compare the public lottery with the private correlation device. These constitute two treatments in our experiment.

Based on our set-up, we expect no differences between two treatments (devices) in terms of following recommendations, in particular, recommendation X (Hypotheses 1 and 1a). Also, our choice of the payoffs theoretically confirms that there should not be any difference between following recommendation of X and Y within the treatment involving the private device (Hypothesis 2). In line with the existing literature on correlation, we do find that individuals follow recommendations from these devices; however, despite the theoretical choices of our payoffs, we find differences between and within our treatments. We observe that players follow recommendation Y when it comes from the public device more than that from the private device (Result 1); also, recommendation Y is followed more than X, particularly, from the public device (Result 2).

2 SET UP

Fix any finite normal form game, $G = [N, \{S_i\}_{i\in N}, \{u_i\}_{i\in N}]$, with set of players, $N = \{1, ..., n\}$, finite pure strategy sets, $S_1, ..., S_n$ with $S = \prod_{i\in N} S_i$, and payoff functions, $u_1, ..., u_n$, $u_i : S \to \Re$, for all i. A direct correlation device, μ, is just a probability distribution over S that can extend any given game G; the device first selects a strategy profile s $(= (s_1, ..., s_n))$ according to the probability distribution μ, and then sends the private recommendation s_i to each player i. Such a device is called a correlated equilibrium (Aumann 1974, 1987) if all the players follow the recommended strategies.

Formally, with the notation $s_{-i} \in S_{-i} = \prod_{j \neq i} S_j$, μ is a correlated equilibrium of the game G if $\sum_{s_{-i} \in S_{-i}} \mu(s_i, s_{-i}) u_i(s_i, s_{-i}) \geq \sum_{s_{-i} \in S_{-i}} \mu(s_i, s_{-i}) u_i(t_i, s_{-i})$, for all i, for all s_i, $t_i \in S_i$.

We consider a parametric version of the two-person game of Chicken, as presented in Kar *et al.* (2010), shown in Table 1 below, where, $a < b < c < d$. Each of the two players has two pure strategies, namely, X and Y.

	X	Y
X	a, a	d, b
Y	b, d	c, c

Table 1: Parametric Version of the Game of Chicken

The above game has two pure Nash equilibria, namely, (X, Y) and (Y, X), and a mixed Nash equilibrium in which each player plays X with probability $\frac{(d-c)}{(d-c)+(b-a)}$.

We call any direct correlation device μ a *public* device if for all $s \in S$, either $\mu(s) = 0$ or, when $\mu(s) > 0$, the conditional probability of (s_{-i}) given s_i is 1, for all i. For any normal form game G, any convex combination of pure Nash equilibria (of G) can be viewed as a public device and also is a correlated equilibrium of G.

We consider two particular direct correlation devices for our game of Chicken, as shown in Table 2 below.

Public Device			*Private Device*		
	X	Y		X	Y
X	0	$\frac{1}{2}$	X	0	$\frac{1}{3}$
Y	$\frac{1}{2}$	0	Y	$\frac{1}{3}$	$\frac{1}{3}$

Table 2: Correlation Devices

The first one is a convex combination of two pure Nash equilibria and thus is a *public* device. In the rest of the paper, we refer to this specific device as the *public* device. We refer to the second device as the *private* device. Note that in the private device, the posterior probabilities given recommendation Y are $(\frac{1}{2}, \frac{1}{2})$ and hence are easy to understand and interpret.

2.1 Choice of Parameters

The private device is a correlated equilibrium for Chicken only for some range of parameters for our game of Chicken in Table 1. We thus choose the payoffs in the game, by imposing some restrictions on the parameters, so that the public and private devices described above are appropriate for our analysis.

We also focus on the correlated equilibrium that maximises the sum of the expected payoffs, often called the *utilitarian correlated equilibrium*, for the game of Chicken as in Table 1, that has been characterised in Kar *et al.* (2010).

Criterion 1 *For the game of Chicken, both the public and the private devices are the utilitarian correlated equilibrium for the game (and have the same expected payoffs).*

From the analysis in Kar *et al.* (2010), Criterion 1 holds under $2c = b + d$ and $\frac{b+d}{2} = \frac{b+c+d}{3}$ (which also implies $2c = b + d$).

Criterion 2 *The conditional expected gains in payoffs from following recommendations X and Y are the same in the private device.*

Criterion 2 can be translated as the expected payoff from playing X given the recommendation X minus the expected payoff from playing Y given X is equal to the expected payoff from Y given Y minus the expected payoff from X given Y, in the private device. This criterion allows us to compare the results from two different recommendations from the private device. For Criterion 2 to hold, we require $b - a = 3(d - c)$.

We now claim that the parametric version of Chicken satisfying the above two criteria can be identified by only two parameters, namely, a and x $(= (d - c))$, only. This is because, from Criterion 1, we need $(c - b) = (d - c) = x$ (say). Then, from Criterion 2, we must have $(b - a) = 3x$. With this choice, the parameters are $a > 0$, $b = a + 3x$, $c = b + x = a + 4x$ and $d = c + x = a + 5x$.

Given these parameters, the mixed strategy Nash equilibrium for the game of Chicken turns out to be $(\frac{1}{4}, \frac{3}{4})$, regardless of the specific values of a and x, as $\frac{(d-c)}{(d-c)+(b-a)} = \frac{x}{x+3x} = \frac{1}{4}$. The expected payoffs from the private and public devices for the game of Chicken are all equal to $a + 4x$. The private device is a correlated equilibrium as the equilibrium conditions are satisfied (with strict inequalities).

In order to avoid the possible effect of individuals' aversion for negative and zero payoffs in experiments, we choose, $a > 0$. We also impose $x = (d - c) >> 0$. Although (Y, Y) is not a Nash equilibrium in the game of Chicken, as long as $d > c$, the strategy of playing Y may appear to be a weakly dominant strategy, when $d - c$ is small.

3 EXPERIMENTAL DESIGN

For our experiment, we choose $a = 2$ and $x = 3$ (and hence, $b = 11$, $c = 14$ and $d = 17$) as our parameters of Chicken. For this specific game, pure Nash equilibrium payoffs are $(17, 11)$ and $(11, 17)$; the mixed Nash equilibrium payoffs are $(\frac{53}{4}, \frac{53}{4})$. The expected payoffs from both the private and public devices are equal to $(14, 14)$, higher than the mixed Nash equilibrium payoffs.

As the main purpose of our paper is to analyse the robustness of following recommendations from the public device and the private device for the game of Chicken, we have just two treatments. We call these treatments *Public* and *Private*, as summarised below in Table 3.

Public						*Private*					
	X	Y		X	Y		X	Y		X	Y
X	$2, 2$	$17, 11$	X	0	$\frac{1}{2}$	X	$2, 2$	$17, 11$	X	0	$\frac{1}{3}$
Y	$11, 17$	$14, 14$	Y	$\frac{1}{2}$	0	Y	$11, 17$	$14, 14$	Y	$\frac{1}{3}$	$\frac{1}{3}$
Mixed NE strategy: $(\frac{1}{4}, \frac{3}{4})$; payoff: $\frac{53}{4} = 13.25$						Mixed NE strategy: $(\frac{1}{4}, \frac{3}{4})$; payoff: $\frac{53}{4} = 13.25$					
Player's payoff when device is followed: 14						Player's payoff when device is followed: 14					

Table 3: Overview of Experimental Treatments

Note that we do not have any treatment on the game without correlation devices, as a possible benchmark. Such a benchmark has already been covered in the existing literature on correlation (for example, by Duffy and Feltovich 2010, for the game of Chicken). Our two treatments compare the effect of different correlation devices.

We randomly re-matched the subjects in every round in order to create an environment as close as possible to a one-period interaction between subjects. Subjects were informed that they had been randomly paired with participants, different from one round to the next; however, they were not aware of the identity of the subjects they were matched with. The same matching protocol was used in all matching groups.

We used the so-called "between subjects" design. In any of our experimental sessions, only one of the two treatments was run. For each of the treatments, we used 6 matching groups, each comprising of 8 subjects (i.e., 4 pairs). Each treatment lasted for 20 rounds. Because of the likely dependencies between decisions made within matching groups, we took one matching group as our unit of observations and treated these observations as independent data points for performing all our statistical tests.

The description of the actual experimental procedure can be found in the Appendix of this paper.

3.1 Hypotheses

Following the literature on correlation as mentioned in the Introduction, we expect that individuals actually follow their recommendations from a correlated equilibrium. Based on our choices of the parameters in the game (using Criterion 1), we maintain the same expected payoffs (when recommendations are followed) in both treatments. We thus hypothesise that the rate of following should not vary between our two treatments.

Hypothesis 1 *There is no difference in the rates of following all recommendations between two treatments.*

Criterion 2 implies that for the Private treatment, conditional on believing that the other player is following their recommendation, the expected payoff loss from deviating from either recommendation is 3. However, note that in the Public treatment, the expected payoff loss from deviating from recommendation X is still 3, while the loss from deviating from recommendation Y is 9. This implies higher rate of following recommendation Y in the Public treatment, compared to any of the three other cases.

We hence modify our Hypothesis 1 accordingly.

Hypothesis 1a *There is no difference in the rates of following recommendation X between two treatments.*

We will test the above null hypotheses (1 and 1a) against the respective alternative that there may be differences between public and private correlation devices when it comes to following recommendations.

Based on Criterion 2, we hypothesise that both recommendations, X and Y, should be equally followed in the Private treatment.

Thus, our second null hypothesis is as follows.

Hypothesis 2 *Within the Private treatment, there is no difference between the rates of following recommendation X and following recommendation Y.*

A possible alternative hypothesis to the above null Hypothesis 2 is that recommendation Y will be followed more than X in the Private treatment.

4 RESULTS

In this section, we present our findings from the experiment and subsequently test our hypotheses. We first present the average frequencies of following recommendations in both treatments. Table 4 below shows the percentages of following two different recommendations, X and Y, in each treatment, over 20 periods, in two halves (of equal ten-period blocks).

Treatments / Following in Five-Period Blocks (%)	1 – 10	11 – 20	Total
Public (Follow X)	65.42	72.92	69.17
Public (Follow Y)	85.83	89.58	87.71
Public (Follow All)	75.62	81.25	78.44
Private (Follow X)	70.51	60.34	65.15
Private (Follow Y)	76.23	74.51	75.40
Private (Follow All)	74.38	69.38	71.88

Table 4: Frequencies of Following Recommendations in Treatments over Time Periods

The average frequencies of following recommendations are indeed quite high in both treatments, as established in the literature.

Now, we check whether there are differences in following recommendations between our treatments and thereby formally test our Hypotheses 1 and 1a. To test this, we consider the frequencies from 6 matching groups, formed of 8 subjects each (hence, independent observations), separately in both treatments. We also look at the sets of frequencies for two different recommendations X and Y separately.

Matching Groups / Following (%)	All Recommendations		X		Y	
Column I: Treatments (Devices)	II: Public	III: Private	IV: Public	V: Private	VI: Public	VII: Private
Matching Gr 1 (Indep Obs 1)	91.25	71.25	87.50	65.46	95.00	74.29
Matching Gr 2 (Indep Obs 2)	77.50	67.50	73.75	60.00	81.25	71.43
Matching Gr 3 (Indep Obs 3)	66.25	65.00	51.25	65.46	81.25	64.76
Matching Gr 4 (Indep Obs 4)	88.12	69.38	80.00	54.55	96.25	77.14
Matching Gr 5 (Indep Obs 5)	70.00	82.50	51.25	80.00	88.75	83.80
Matching Gr 6 (Indep Obs 6)	77.50	75.63	71.25	65.46	83.75	80.95
Total	78.44	71.88	69.17	65.15	87.71	75.40

Table 5: Frequencies of Following All Recommendations in Matching Groups and Treatments

Based on an appropriate Kruskal-Wallis test for these sets of numbers from our independent observations (that is, numbers reported in columns II and III in Table 5 above), we cannot find any significant difference in following all recommendations between our treatments (p-value = 0.1994). Also, based on another similar Kruskal-Wallis test, we fail to find any significant difference in terms of following recommendation X between two treatments, that is, numbers reported in columns IV and V in Table 5 above (p-value = 0.5711). Hence, we find support in favour of both hypotheses 1 and 1a.

We do however find a significant (at 5%) difference in following recommendation Y between Public and Private treatments (p-value = 0.0161), which can also be observed clearly in the last two columns in Table 5; note that, all the numbers in column VI are indeed higher than the corresponding numbers in column VII. We state this finding formally.

Result 1 *There are significant differences in following recommendation Y between two treatments; individuals follow recommendation Y from the public device more than that from the private device.*

Tables 4 and 5 also suggest that there are differences between following two different recommendations. Recommendation Y appears to be followed more than X, within each treatment, which can be observed in comparing columns IV and VI (for public), as well as columns V and VII (for private) in Table 5. To confirm this, we compare independent observations for following recommendations X and Y within each treatment, by using a Kruskal-Wallis test. Indeed, in both treatments, we find a significant difference. For the private device, this difference however is significant only at the 10% level (p-value = 0.0761), while, we find a significant difference at 5% in the public device (p-value = 0.0159).

From the above analysis, we reject our Hypothesis 2. We state this result formally below.

Result 2 *Individuals follow recommendation Y more than X, particularly, from the public device.*

5 CONCLUDING REMARKS

Our results (Results 1 and 2) regarding the differences can be explained, based on the individuals' behaviour when they do not follow recommendations.

Result 1 indicates that there is significant difference between our treatments, only in following recommendation Y. This is due to the conditional payoff loss from not following recommendation Y, as explained in subsection 3.1 (Hypotheses). These deviation payoffs were also a focus of Cason and Sharma, 2007.

Result 2 suggests that Y is followed more than X in both treatments, particularly in the public device. This is potentially because, strategy Y may be viewed as a "weakly dominant" strategy and therefore players may find strategy Y more attractive than strategy X. Result 1 implies that recommendation Y is less followed in the private device than in the public device; this is perhaps because following Y is more "risky" in the private device due to the nature of the device.

"Inequality-averse" players may choose to achieve the "cooperative" outcome (Y, Y) in the game of Chicken. In a parallel paper, we (Bone *et al.* 2024) use recommendations from the public device and observe significant differences in frequencies of the outcome (Y, Y) in various 2 x 2 games, a finding that suggests that the players try to achieve the “cooperative” outcome when they do not follow recommendations.

Our result on public device is related to the literature on “taking turns” and also on “sunspot”. From a relevant experimental literature on coordination, we know that in symmetric 2 x 2 games like BoS, individuals avoid coordination-failure by following a correlation device that randomly selects one of the two pure Nash equilibria. Duffy and Fisher (2005) introduce sunspots as coordination devices using randomisation over equilibria. Stahl (2013) and Camera *et al.* (2011) use randomised messages for cooperation in Prisoners' Dilemma, while Brandts and McLeod (1995) and Seely *et al.* (2005) analyse public recommendations.

Findings from experiments on public information (McKelvey and Page 1990; Marimon *et al.* 1993; McCabe *et al.* 2000; Anctil *et al.* 2004; Heinemann *et al.* 2004) are also related to our results. However, Georgalos *et al.* (2020) show that players do not commit to a (coarse) correlation device that picks, with equal probability, the pure Nash outcome and other symmetric outcomes around Nash point of a game.

For future research, one may consider a few different directions. Ray (2002) analyses different non-canonical correlation devices to implement a correlated equilibrium. In our framework, one may wish to run further experiments with recommendations from such non-direct correlation devices.

6 APPENDICES

We first explain the procedure followed in our experiment below.

6.1 Experimental Procedure

All sessions used an identical protocol. At the beginning of a session, subjects were seated and given a set of written instructions. All subjects in a session had identical instructions and were given five minutes to read the written instructions and then, after reading the instructions, a few minutes to complete a brief comprehension test (see Appendix), to ensure that they have understood the instructions, before starting the experiment itself. When the subjects had done the test, we went round to them individually to make sure that they had all the answers correct. The experiment did not proceed until every subject had the correct answers to these questions. Subjects were not allowed to communicate with one another throughout the session, except via the decisions they made during the experiment. We report the full instructions only for the Chicken-Private treatment in the Appendix of this paper. The instruction for the other treatment is similar and hence has been omitted and is available upon request.

Notice that our game can be described without assigning the subjects to be a row or a column player. Hence, each pair of subjects was described as "you and your counterpart". Note also that we used a neutral terminology and avoided using any term that may have some other connotations, such as, "your opponent" or "your partner". Subjects were not given identifying information about their counterparts in any round to avoid any subject-specific reputation that may develop across the rounds.

At the beginning of a round, subjects were shown the payoff matrix corresponding to the game, along with their recommended action, which was randomly drawn from the appropriate probability distribution given by the device. We used a neutral framing to offer the recommendations by using the phrase "it is recommended that you choose ...". We also clearly explain (see the instructions in the Appendix) the probability distribution, the conditional probabilities and the expected payoffs in simple terms.

For any treatment, in all its sessions, we used the *same* random sequence of recommendations to reduce across-subject variation. After the subjects decided which action to choose, they were provided with the feedback on their own recommendation, own chosen action, counterpart's recommendation, counterpart's chosen action, own payoff and counterpart's payoff, after each round. Subjects were also given a record sheet (see Appendix) to keep track of the feedback information from previous rounds.

At the end of round 20, the experimental session ended. Subjects were asked to complete a brief on-screen questionnaire with some supplementary background information and then privately paid according to their point earnings from all 20 rounds, using an exchange rate of £0.03 per point. Average earnings per treatment were as follows: £7.82 for Public treatment and £7.50 for Private treatment.[1]

The experiment was programmed and conducted with the software *z-Tree* (Fischbacher, 2007). All the sessions were conducted at the laboratory of the Centre for Experimental Economics (EXEC) at the University of York. The subjects were recruited, using the ORSEE software (Greiner, 2004), from various fields of studies of the University of York, including, but certainly not confined to, Economics or other Social Sciences.

We here report the full instructions only for the Private treatment. The instructions for the Public treatment differ from that for the Private treatment only in the *Recommendations* section.

6.2 Instructions (for the Private Treatment)

All participants in this session have the following identical instructions.

Welcome to this experiment, and thank you for participating. From now onwards please do not talk to any other participants until the experiment is finished. You will be given five minutes to read these instructions. Then we will ask you to complete a brief test to ensure that you have understood them, before starting the experiment itself.

Your Decision Problem

In this experiment, you are asked to make a simple choice, in each of 20 successive rounds. In each round you earn a number of points, as described below. The total number of points you accumulate over the 20 rounds determines your final money payment, at a conversion rate of 10 points = 30 pence.

In each round, you are randomly paired with another participant, different from one round to the next, whom we call your counterpart for that round. You and your various counterparts remain anonymous to each other at all times, and you have no direct contact with each other during the experiment. In each round, you and your counterpart each have to choose one of two alternatives, X and Y. You do so independently of each other and without any communication. So, at the moment you make your own choice, you do not know what is your counterpart's choice. You and your counterpart's choices together determine the points you each earn from that round, as in the following table.

		Your Counterpart's Choice	
		X	Y
Your Choice	X	$2, 2$	$17, 11$
	Y	$11, 17$	$14, 14$

[1] There was no show-up fee for our experiment. Sessions lasted, on average, for 40 minutes. Our average payment is higher than student-jobs in the UK that offer about £8.00 per hour.

The first number in each cell indicates your points, and the second your counterpart's points. For example, if in some round you choose X while your counterpart chooses Y then from that round you will earn 17 points and your counterpart will earn 11 points. Notice that, whatever your counterpart's choice, you earn more points by choosing differently from your counterpart. Thus, if your counterpart's choice is X then you earn more points by choosing Y rather than X (giving you 11 points rather than 2), while if your counterpart's choice is Y then you earn more points by choosing X rather than Y (17 points rather than 14). Notice also that if your counterpart's choice is equally likely to be X or Y, then you earn more points on average by choosing Y (12.5 being the average of 11 and 14) rather than X (9.5 being the average of 2 and 17). As you can see from the table, everything is symmetric between you and your counterpart. So, exactly the same considerations as above apply for your counterpart, to whom of course you are the counterpart, and who will have read these exact same instructions.

Recommendations

At the start of each round, you and your counterpart are each given *recommendations* for your choices, generated randomly by the computer. It is entirely up to you, in any round, whether or not to follow the recommendation you are given. The points that you earn depend only on the actual choices made by you and your counterpart, as described on the previous page, irrespective of the recommendations. In each round, you are informed of only of the recommendation for you. But, as explained below, you may be able to infer something about your counterpart's recommendation.

The recommendations are generated randomly by the computer in each round, programmed such that there are only three equally-likely possibilities:

- there is a $\frac{1}{3}$ chance that you are recommended to choose X, and your counterpart recommended to choose Y;
- there is a $\frac{1}{3}$ chance that you are recommended to choose Y, and your counterpart recommended to choose X;
- there is a $\frac{1}{3}$ chance that you are both recommended to choose Y.

It will never happen that you are both recommended to choose X. These possibilities are summarised as follows:

Recommendation for You	Recommendation for Your Counterpart	Probability
X	X	0
X	Y	$\frac{1}{3}$
Y	X	$\frac{1}{3}$
Y	Y	$\frac{1}{3}$

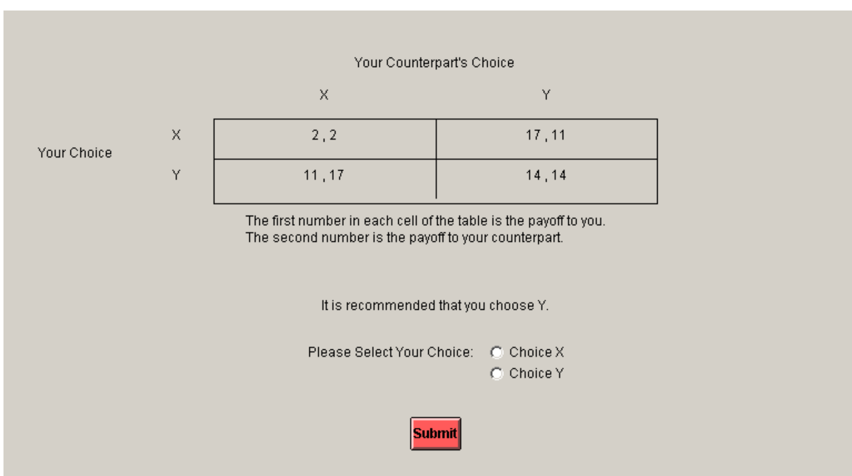
Notice that if the recommendation for you is X then you can infer that the recommendation for your counterpart is Y, and if the recommendation for you is Y then you can infer that the recommendation for your counterpart is equally likely to be X or Y. It is entirely up to you whether or not to follow your recommendation in any round. But notice that if your counterpart follows his or her recommendation then (on average) you earn more points by following yours, than by not doing so. This is because:

- if your recommendation is X then your counterpart's must be Y, and if your counterpart chooses Y then you earn more points by choosing X rather than Y;
- if your recommendation is Y then your counterpart's is equally likely to be X or Y, and if your counterpart is equally likely to choose X or Y then you earn more points on average by choosing Y rather than X.

However, if your counterpart does *not* follow his or her recommendation then it is possible that you will earn more points by also not following yours. This is because, in any round, it is always better for you to choose differently from your counterpart, as explained on the previous page, whatever the recommendations you have each received.

The Computer Screen

The main screen for each round looks like this. It includes the payoff table, which is the same in each round, and below it the recommendation for you in that round, which is random and may vary from one round to the next. Shown here, to illustrate, is a recommendation for you to choose Y.



To make your choice you simply select the appropriate button and then click on Submit. You may then have to wait a few moments until all participants have made their choices, after which will appear on-screen the results for you and your counterpart in that round. On your desk is a Record Sheet on which you can keep a note of these results, if you wish to. After all the participants have read their results and clicked Continue, the main screen for the next round will appear, again as shown above.

At the End of the Experiment

When all 20 rounds have been completed, you will be asked to complete a brief on-screen questionnaire, which provides useful supplementary (anonymous) information for us. Having completed the questionnaire, you will see a final screen reporting your total points accumulated over the 20 rounds and the corresponding £ payment. Please then wait for further instructions from the experimenter, who will pay you in cash before you leave. While waiting, please complete the receipt form which you will also find on your desk. We need these receipts for our own accounts.

The results from this experiment will be used solely for academic research. Participants will remain completely anonymous in any publications connected with this experiment. Thank you for participating. We hope that you enjoy the experiment, and that you will be willing to participate again in our future experiments.

6.3 Test

After reading the instructions, you will be asked to complete this brief test, to ensure you have understood them, before starting the experiment itself. You may look again at the instructions while answering these questions.

For questions 1-4, write the answers.

1. If you choose Y and your counterpart chooses X, how many points do you earn in that round?

2. If you choose Y and your counterpart chooses X, how many points does your counterpart earn in that round?

3. If you choose X and your counterpart chooses X, how many points do you earn in that round?

4. If over the 20 rounds you accumulate a total of 100 points, what is your final cash payment (in £) for the experiment?

For questions 5-8, circle either True or False.

5. Your counterpart is the same person in each round. True / False

6. If the recommendation for you is Y, then your counterpart's recommendation must be X. True / False

7. Whatever your counterpart chooses, you always get more points by following your recommendation. True / False

8. In any publications arising from this experiment the participants will be completely anonymous. True / False

Thank you for completing this test. Please leave this completed sheet face up on your desk. The experimenter will come round to check that you have the correct answers. If any of your answers are incorrect then the experimenter will give you some explanatory feedback.

6.4 Record Sheet

Use of this sheet is optional. It is provided so that you can keep a record of the results in each round, as reported on your computer screen at the end of the round. This may be useful to you in considering your decisions in subsequent rounds. In each cell in the table below, simply circle X or Y as appropriate, while the information is still on your screen at the end of that round, before clicking Continue.

Round	My Reco.	Choice	Counterpart's Reco.	Choice	My Point
1	X Y	X Y	X Y	X Y	
2	X Y	X Y	X Y	X Y	
3	X Y	X Y	X Y	X Y	
4	X Y	X Y	X Y	X Y	
5	X Y	X Y	X Y	X Y	
6	X Y	X Y	X Y	X Y	
7	X Y	X Y	X Y	X Y	
8	X Y	X Y	X Y	X Y	
9	X Y	X Y	X Y	X Y	
10	X Y	X Y	X Y	X Y	
11	X Y	X Y	X Y	X Y	
12	X Y	X Y	X Y	X Y	
13	X Y	X Y	X Y	X Y	
14	X Y	X Y	X Y	X Y	
15	X Y	X Y	X Y	X Y	
16	X Y	X Y	X Y	X Y	
17	X Y	X Y	X Y	X Y	
18	X Y	X Y	X Y	X Y	
19	X Y	X Y	X Y	X Y	
20	X Y	X Y	X Y	X Y	

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