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David Rojo Arjona† Stefania Sitzia‡ Jiwei Zheng§

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Abstract

Focal points (Schelling, 1960) have shown limitations as coordination devices in games with conflict, such as the battle of the sexes games. We experimentally test whether an increase in their salience can counteract the negative impact of conflict on coordination. The intuition is that, in the presence of conflict, the solution to the coordination dilemma offered by the focal point loses importance. Increasing its salience increases its relevance and therefore coordination success. Our results provide strong support for this conjecture. Furthermore, when games feature outcomes with different degrees of payoffs' inequality (i.e. the difference of players' payoffs) and efficiency (i.e. the sum of players' payoffs), increasing salience does not lead to an obvious increase in coordination, unless the salience of the focal point is maximal.

Keywords: coordination games, focal points, salience, conflict of interests, battle-of-the-sexes, intermixed-blocked effect.

JEL Codes: C72, C78, C91, D91

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1 Introduction

If husband and wife lose each other in a department store without a prior agreement on where to meet, they are likely to look for an "obvious" place. A place (e.g., the lost-and-found stand) that they both "must 'mutually recognize' [as] some unique signal that coordinates their expectations" (Schelling, 1960, p. 54). Using anecdotes such as this, as well as "unscientific experiments", Schelling shows that payoff-irrelevant features of a strategic situation often offer a solution, a focal point, that allows individuals to coordinate more successfully than what conventional game theory predicts, provided these features are visible to all players and common knowledge.

According to Schelling, players use these payoff-irrelevant features to label strategies and identify a solution even in games in which interests are not completely aligned - e.g., battle of the sexes games. (Imagine for example that wife prefers to meet in the travel agency section and the husband in the sport section, and both are aware of this). Coordinating on this solution however, requires "discipline" as:

> "The need for agreement overrules the potential disagreement, and each must concert with the other or lose altogether" (Schelling, 1960, p. 60).

And players simply have to accept what nature has chosen as the signal for coordination:

> "Beggars cannot be choosers about the source of their signal or about its attractiveness compared with others that they can only wish were as conspicuous. [...] The conflict gets reconciled - or perhaps we should say ignored - as a by-product of the dominant need for coordination." (Schelling, 1960, pp. 66, 59).

Experimental evidence supports Schelling's theory of focal points mostly in games without conflict of interests. In these games, often referred to as pure coordination games, payoffs for both players and across equilibria are the same (e.g. Mehta et al., 1994; Crawford et al., 2008; Isoni et al., 2013). By contrast, in games with conflict of interests the effectiveness of focal points is greatly reduced (e.g. Crawford et al., 2008; Isoni et al., 2013; Parravano and Poulsen, 2015). Although the coordination failure observed in these games has been shown to be compatible with level-k thinking (Crawford et al., 2008; Faillo et al., 2017; van Elten and Penczynski, 2020), alternative hypotheses have been investigated. These hypotheses mostly concern, directly or indirectly, payoff-related mechanisms.

For example, Isoni et al. (2013), investigate whether the negative effect of conflict on coordination, documented on matching games (i.e. games in which players are required to choose the same object) such as the battle of the sexes, carries over to bargaining games in which players make claims on a surplus, represented by valuable discs. Coordination occurs if no disc is claimed by both bargainers. They find that even in these games conflict damages coordination, although to a lesser extent than what is reported by Crawford et al. (2008). Penczynski et al. (2021) split the payoffs of battle of the sexes games, in an attempt to highlight players' common interest in coordinating. They find that when the common interest payoffs are highly salient, coordination improves but the presence of conflict still damages coordination. Parravano and Poulsen (2015) change the size of the payoffs and thus the incentives to coordinate. Their results are consistent with Crawford et al. (2008). Finally, Isoni et al. (2019) investigate whether varying the amount of information that players have on the payoffs affects coordination. Their experimental manipulation, however, is mostly ineffective. For a comprehensive review of focal point experiments see Rojo Arjona (2020).

The literature above shows that payoff-related mechanisms have had limited success in overcoming coordination failure in the presence of conflict. In the spirit of Schelling's theory of focal point, our contribution focuses instead on label-based mechanisms consisting of a salience manipulation of the focal point.

The importance of salience in these games can be better understood by referring back to the husband and wife's anecdote. If the consorts have opposing preferences of where to meet, attention might shift from the focal point to the conflict, leading to doubts as to what each consort will do: is she(he) going to go to her(his) preferred place? Is she(he) going to go to my preferred place? These doubts, in the absence of communication, might prevent the "meeting of minds" that Schelling poses as the basis for coordination. The conflict of interest reduces the perceived importance of the focal point as a solution to the coordination problem and at the same time increases that of the payoffs. But because payoffs cannot offer a unique solution, coordination is less likely to occur. We experimentally investigate whether increasing the salience of the focal point helps increase its perceived importance. The intuition is that, in Schelling's words, increasing the salience of the "obvious place" will increase its "power of suggestion", so that the obvious place now "commands [more] attention" than before.

Our experimental design builds on the pie game by Crawford et al. (2008) as this study is the first one to provide evidence against Schelling's theory, and the game lends itself nicely to salience manipulations. In the pie game, two players are presented with a 3-slice pie with one slice uniquely coloured. Players, without communicating, simultaneously choose one of the slices, and coordinate if they choose the same slice. In our experiment, the uniquely coloured slice is red and we manipulate its salience (obviousness) by increasing the number of the non-salient slices. To this effect, we employ four types of pies with two, three, seven and eleven slices. The greater the number of these slices, the greater the salience of the red slice.

Like previous studies, we employ: a pure coordination game (PC) as a benchmark to evaluate coordination success in other games and the effectiveness of our salience manipulation; four games with different degrees of conflict of interest between players ($A1 - A4$); a hi-lo game (HL), that like pure coordination games does not feature conflict of interest, but unlike these games one coordinated outcome Pareto-dominates the others; and four games in which coordinated outcomes vary for the degree of inequality between players' payoffs ($B1 - B4$). We implemented these games within subjects and the pie types between subjects.

We find that subjects choose the red slice significantly more often in pies with a large number slices compared to those with fewer slices. This is the case not only in PC games but also, as hypothesised, in games with conflict of interest, although the effect of salience is not as strong as in PC.

In this experiment, the perceived importance of the payoffs might be increased at the expense of the focal point, by having the same pie type with different payoffs in all tasks. Evidence from cognitive psychology (e.g. Gibson, 1969; Hall, 2003; Lavis et al., 2011) shows that the perceived salience of some distinctive features (e.g., A and B) with respect to a common feature (e.g., X) – and the corresponding behavioural impact – can increase depending on the sequence in which stimuli (AX and BX) are presented to subjects (human and animal). For example, Mackintosh et al. (1991) find that rats pay more attention to the sucrose - A - and the saline - B - element of flavours than to the lemon base (X) when the compound flavours are presented in an intermixed sequence - $AX, BX, AX, BX \dots$ - than when they are presented in blocks - $AX, AX, BX, BX \dots$ - i.e. intermixed-blocked effect. Based on this evidence, we believe that the between-subject design, which relies on a methodology that is widely used in economic experiments, highlights the importance of the payoffs. In our experiment, the payoffs are the distinctive features A, $B \dots$, and the pie type the common one X. In an attempt to increase even further the salience of the red slice, we also run a within-subject version of the same experiment, in which *both* games and pie types are implemented within-subject.[1] For an extensive discussion about the advantages and disadvantages of within-subject and between-subject designs, see Charness et al. (2012).

The intermixed-blocked effects can be seen as a close relative of behavioural spillovers reported in the economic literature. In principle, the two effects might in fact refer to the same behavioural phenomenon, however given that we are not aware of any studies that

[1] The use of findings from other disciplines, such as cognitive psychology, is not only common but also fruitful in the study of focal points (see Kuo et al., 2009; Hargreaves-Heap et al., 2017; Sontuoso and Bhatia, 2020; Li and Camerer, 2019)

compare and contrast the two effects, we are not in a position to say more about how they relate to each other. What matters here though is that having the pie types implemented within-subject might give rise to spillovers of salience. There is a growing literature that studies behavioural spillovers in both cooperation and coordination games (e.g. Bednar et al., 2012; Cason et al., 2012; Haruvy and Stahl, 2012). Relevant to our study are behaviour spillovers of a concept or rule learnt in one game and applied to another one. Example of such spillovers include the concept of Pareto-dominance that is transferred from stag-hunt games to order statistics games (Cooper and Kagel, 2005) and the transfer of norms of cooperation from weak-link games to Prisoners' dilemmas (Knez and Camerer, 2000). In our experiment, salience as a solution concept might spillover from the 11- and 7-slice pies to pies with fewer slices. Once the importance of the focal point as a coordination device is recognised in one context (e.g. 11-slice pie), it can be fruitfully applied to another one (e.g. 2-slice pie).

In the within-subject experiment we find evidence of an even stronger effect of salience compared to the between-subject experiment. Subjects choose the red slice more frequently in all pies types and games compared to the between-subject experiment. Furthermore, we find, in most cases, no differences in the proportion of red slice choices across pie types. Finally, even in games with conflicts of interest, we report, with few exceptions, little evidence of coordination failure.

Overall we find strong support for our conjecture. When the salience of the focal points increases, coordination success increases. When the salience of the focal point is at its lowest (e.g. the 2-slice pie in the between-subject design), our results mimic the pattern observed in the literature (e.g. Crawford et al., 2008; Isoni et al., 2013). When the salience of the focal point is at its highest, our results support Schelling's theory of focal point. Our findings, therefore, reconcile both the stylised facts highlighted in previous experiments and Schelling's theory of focal points.

The remainder of the paper is organised as follows. Section 2 deals with the experimental design; Section 3 sets out the hypotheses; Section 4 is devoted to the experimental results and Section 5 concludes.

2 Experimental Design

2.1 Game Description

Coordination games with payoff-irrelevant cues feature two players, indexed $i = \{1, 2\}$; a set of n pure strategies $\{s_1, ..., s_n\}$, indexed j; and a set of n labels $\{l_1, ..., l_n\}$, with a one-to-one correspondence between labels and strategies. The set of labels is identical for and known by both players. If players choose the same strategy j, their payoffs are given by $\pi_{ij} > 0$; otherwise is $\pi_{ij} = 0$.

2.2 Frame Selection

A typical experimental procedure to induce label salience consists of attaching one label to each strategy so that one stands out. Crawford et al. (2008), for example, use a coordination game in which strategies are labelled "X" and "Y". Their results show that "X" is more salient than "Y". By contrast, in the 3-slice pie game by the same authors, or in the games employed by Hargreaves-Heap et al. (2014), salience comes from one label being unique, an oddity. By definition, oddities require more than two strategies and, as the frequency of non-unique labels increases, the oddity becomes less frequent and therefore more salient.

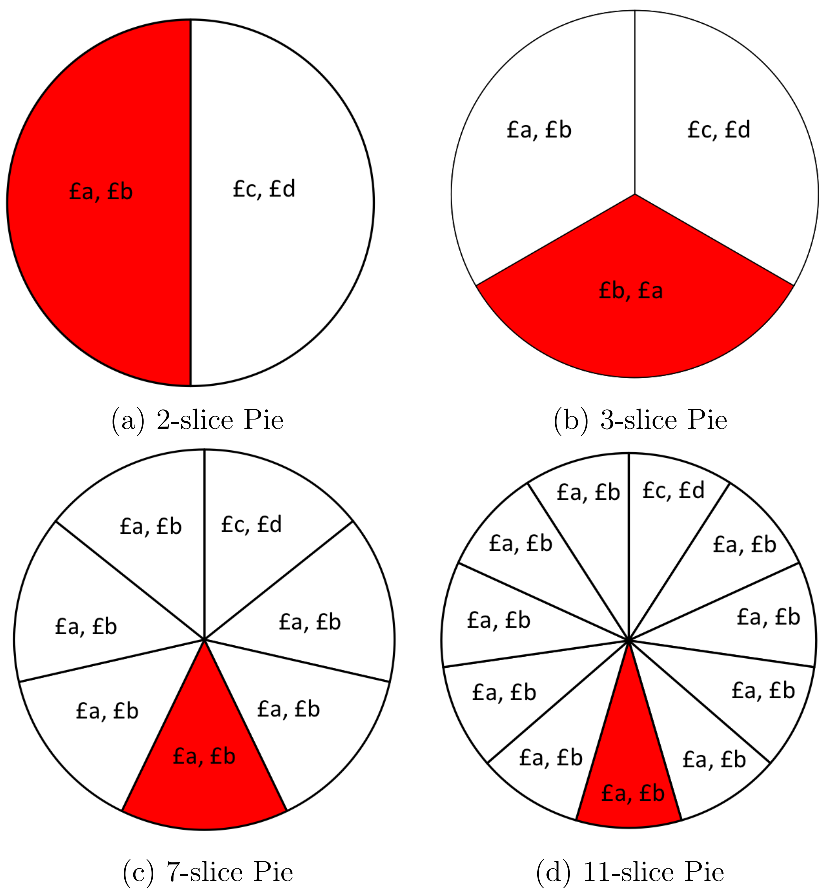

Figure 1: Pies used in the experiment

In our experiment (see Figure 1) we use variations of the pie game. Our pies feature $n \in \{2, 3, 7, 11\}$ slices with colour as labels. Specifically $l_1 = \{red\}$ and $l_j = \{white\}$ for $j \neq 1$. Players' payoffs are given by $\pi_{1j} = a$ and $\pi_{2j} = b$ if $j \neq 2$ and $\pi_{1j} = c$ and $\pi_{2j} = d$

if $j = 2$. When $n = 2$, l_1 is salient by virtue of its colour. As evidenced by research in psychology, and neuroscience, the colour red possesses some unique features that make it stand out compared to other colours (see Elliot and Maier, 2014, for a review).[2] When $n > 2$, l_1 becomes more salient as it is an oddity, and as n increases, its frequency $(\frac{1}{n})$ decreases becoming visually more salient. Thus, by increasing the number of slices we vary the salience of l_1.[3]

We denote the unique *R*ed *S*lice with coordinated payoffs (a, b) by RS, the slice with coordinated payoffs (c, d) by PS (*P*ayoff *S*alient slice), and the remaining *W*hite slices with the same coordinated payoffs (a, b) as RS by W.

2.3 Payoff Configurations

We employ 10 games whose payoff configurations are reported in Table 1. These have been selected because of their possible interaction with label salience.

Games	*RS (W)* *(a, b)*	*PS* *(c, d)*
PC	10, 10	10, 10
HL	10, 10	11, 11
*A*1	10.1, 10	10, 10.1
*A*2	11, 10	10, 11
*A*3	13, 8	8, 13
*A*4	15, 6	6, 15
*B*1	12, 9	10, 11
*B*2	11, 10	9,12
*B*3	20,10	10,11
*B*4	18, 12	10, 11

Table 1: Game Payoffs

PC is a pure coordination game (i.e., $a = b = c = d$) routinely used in the literature as a benchmark against which behaviour in other games is compared to. HL is a Hi-Lo game with the slice PS being the Pareto-dominant equilibrium and the slice RS being label-salient but

[2] This research demonstrates the special features that the colour red has compared to other colours. Red is visually salient and attracts more attention than other colours (Etchebehere and Fedorovskaya, 2017), it seems to suggest an object's importance and it sticks to memory better than other colours (Kuhbandner et al., 2015). Research on visual systems in humans suggests that the visual salience of an object also relates to its uniqueness and rarity, other than features such as colour, shape etc. (Jiang et al., 2013).

[3] Although we cannot exclude that subjects in our experiment could use labels outside the experimenters' control, we found evidence that this was not the case, as RS was the most prevalent choice.

Pareto-dominated (i.e., $a = b < c = d$). This payoff configuration creates a tension between label salience and payoff dominance.

$A1 - A4$ are games with a *constant degree of conflict* in which $a > c$, $d > b$, and in addition $a = d$ and $b = c$ (battle of the sexes type of games). The degree of conflict is measured by the difference $a - b = d - c$, that progressively increases from $A1$ to $A4$. These games, similar in structure to some of the games in Crawford et al. (2008) and Isoni et al. (2013, 2019), are key to test our label salience hypotheses.

The remaining games provide further insights into the interaction between payoffs and label salience. $B1 - B2$ are games in which the degree of conflict differs across equilibria (i.e., $a > b$ and $d > c$). In $B1$, the label salient equilibrium produces a more unequal distribution of payoffs between players than PS, while in $B2$ the opposite holds. In $B3 - B4$, the sum of players' payoffs in RS is greater than that in PS as is the inequality of payoffs between players. $B3$, in addition, features a conflict of interest that is instead absent in $B4$.

We will indicate the two players as $P1$ (player 1) and $P2$ (player 2). $P1$ has the higher payoff on the focal point (RS) and W slices when present, and the lower payoff on PS. This distinction is not meaningful in games PC and HL.

2.4 Implementation

We implemented the pie types in both a between-subject and within-subject experiment (henceforth BSE and WSE, respectively). Subjects faced 10 payoffs configurations with each pie type in WSE while in BSE, to keep the number of tasks constant across experiments, they faced the payoff configurations four times with the same pie type. The 10 payoffs configurations were randomised in both experiments and in the within-subjects also the pie types.

To avoid creating additional label cues, potentially arising from the relative position of the slices (see Blume and Gneezy, 2010), pies were randomly rotated across participants and, for $n > 3$, RS and PS were kept apart (see Figure 1). Each slice reported the coordinated payoffs, and to make sure subjects were aware of the consequences of not coordinating, the dis-coordination payoffs were reported on the top of the screen. Each participant was randomly paired with another participant in the room in each game. Feedback was only provided at the end of the experiment and only for a randomly selected task. This task, in addition to a participation fee of £2, determined the earnings for the whole experiment.

The experimental sessions were run at the University of East Anglia. A total of 98 and 210 participants took part in WSE and BSE respectively.[4] They were recruited using the

[4]In BSE, the number of subjects in the 2-slice pie, 3-slice pie, 7-slice pie and 11-slice pie treatments are respectively 54, 56, 58 and 42.

hRoot system (Bock et al., 2014) from the general student population. The experiment was run on individual computer terminals with zTree (Fischbacher, 2007). Upon arrival, subjects were asked to read the instructions (see Appendix A.1) and to answer a questionnaire to test their understanding. Average earnings for both experiments, inclusive of the participation fee, were around (£9.61 in WSE within-subject experiment and £7.89 for BSE).

3 Hypotheses

Level-k models (e.g., Crawford et al., 2008) and the theory of team reasoning (Sugden, 1993, 1995; Bacharach, 2006) are commonly employed to explain behaviour in coordination games with salient labels.

Level-k assumes that players differ in their level of strategic sophistication. The model proposed by Crawford et al. (2008) assumes non-strategic Level-0 players ($L0$s) who choose the strategy associated with the outcome with the largest own-payoff with a probability $p > 1/2$ (i.e., $L0$s have a "payoff-bias"). Changes in label salience do not affect the behaviour of level-k players because players react primarily to payoffs and use salience only as a tie-breaker. Therefore an increase in salience does not affect the model's predictions.[5]

Team reasoning assumes that in a coordination problem players look for a rule that, if followed by both players, maximises the chances of coordination leading to the best possible outcome for both. If an outcome stands out by virtue of the labels attached to strategies, for example RS in the pie game, players should choose the corresponding label when no better rule is available. The theory implicitly assumes that, provided such a rule exists, players will be able to identify it and act accordingly. However this might not be the case if players do not recognise the importance of labels in offering a solution to the coordination problem. The importance of labels, we conjecture, is positively related to how salient they are.

Variable Frame Theory (Bacharach, 1993; Bacharach and Bernasconi, 1997; Bacharach, 2006) offers a mechanism that is closely related to our conjecture. We speak about rule identification, the theory speaks about attribute or label identification. According to the theory, some labels are highly available, easily noticeable, and some others are not. Most players can identify highly available strategies, but fewer are able to identify less available ones. Label availability increases with salience and determines players' strategy set (e.g., "*Choose the* red slice", "*Pick a* white slice"). In our context, a player who does not perceive the importance of the red colour in solving the coordination problem will not consider "Choose

[5] It is debated whether $L0$s are an empirical reality or only exists in the mind of higher-level players (Arad and Rubinstein, 2012; van Elten and Penczynski, 2020). The predictions of the model do not depend on this.

the red slice" as the best rule.[6]

While none of these theories can be applied to derive hypotheses in our context without the introduction of new assumptions, our conjecture, if supported by our results, can inform future development of such theories.

The predictions in our games can be summarised as follows. For any given game, an increase in label salience leads to an increase in the proportion of RS choices. The only exceptions is HL. As the rule that maximises players payoffs (if also chosen by the other player) is to choose the payoff-dominant slice PS, increasing label salience does not affect RS choices.

Hypothesis: For any given game, with the exception of HL, an increase in label salience leads to an increase in the proportion of RS choices.

4 Results

4.1 Summary Statistics

Table 2 reports the distribution of RS, PS and pooled W choices (when W slices are present) broken down by game and pie type. Proportions for WSE and BSE are displayed in the top and bottom panel, respectively.

W slices are seldom chosen in both experiments: less than 6% of the times in WSE, and no more than 10% in BSE (e.g., $A2$). PS choices are modal only in HL, consistently with subjects following the payoff-dominant strategy. In all other games, RS is the most frequently chosen slice. Hence, the subsequent analysis will focus on this slice.

Upon inspection of Figure 2, which reports the proportion of RS choices by game and pie type, we observe three main patterns in our data.

(a) In BSE, in line with our hypothesis, the proportion of RS choices increases, with few exceptions, as the number of slices increases.

(b) In almost all games and pie types, RS is chosen more often in WSE than in BSE. Specifically, in games $A1-A4$ we report much larger proportions than previous studies.[7]

[6] An equally valid alternative to the model of team reasoning is to assume that team identification, in the spirit of Bacharach we-thinking (Bacharach, 1993, 2006), can be influenced by label salience. The greater the label salience is, the greater the probability that players we-think and choose accordingly. Charness and Sontuoso (2019) offer a novel solution concept that allows for the possibility that players may become aware of new frames, over time.

[7] Crawford et al. (2008), for example, report for 2×2 games, comparable in terms of degree of conflict to $A1$ and $A2$, an average proportion of label salient choices (such as RS) of about 53% and 39%, respectively.

		Slice	PC	HL	$A1$	$A2$	$A3$	$A4$	$B1$	$B2$	$B3$	$B4$
	#	RS/W	(10,10)	(10,10)	(10.1,10)	(11,10)	(13,8)	(15,6)	(12,9)	(11,10)	(20,10)	(18,12)
		PS	(10,10)	(11,11)	(10,10.1)	(10,11)	(8,13)	(6,15)	(10,11)	(9,12)	(10,11)	(10,11)
WSE	2	RS	0.96	0.16	0.85	0.77	0.76	0.66	0.54	0.87	0.75	0.86
		PS	0.04	0.84	0.15	0.24	0.25	0.34	0.46	0.13	0.26	0.14
	3	RS	0.95	0.18	0.87	0.85	0.78	0.73	0.65	0.83	0.71	0.83
		PS	0.03	0.82	0.12	0.14	0.21	0.27	0.33	0.13	0.27	0.14
		W	0.02	0.00	0.01	0.01	0.01	0.01	0.02	0.04	0.02	0.03
	7	RS	0.93	0.23	0.83	0.76	0.79	0.79	0.57	0.80	0.73	0.85
		PS	0.01	0.76	0.14	0.23	0.17	0.17	0.43	0.17	0.25	0.14
		W	0.06	0.01	0.03	0.02	0.04	0.04	0.00	0.03	0.03	0.01
	11	RS	0.95	0.28	0.84	0.80	0.80	0.82	0.57	0.82	0.72	0.83
		PS	0.01	0.72	0.13	0.17	0.17	0.15	0.43	0.16	0.29	0.14
		W	0.04	0.00	0.03	0.03	0.03	0.03	0.00	0.02	0.00	0.03
BSE	2	RS	0.70	0.04	0.54	0.53	0.55	0.54	0.35	0.75	0.72	0.85
		PS	0.30	0.96	0.46	0.48	0.45	0.46	0.65	0.25	0.29	0.15
	3	RS	0.83	0.17	0.73	0.61	0.67	0.59	0.43	0.75	0.59	0.69
		PS	0.08	0.81	0.20	0.29	0.26	0.33	0.48	0.17	0.34	0.24
		W	0.08	0.03	0.08	0.10	0.08	0.08	0.09	0.09	0.08	0.08
	7	RS	0.92	0.26	0.78	0.69	0.67	0.66	0.53	0.70	0.60	0.65
		PS	0.03	0.71	0.15	0.26	0.27	0.29	0.43	0.23	0.35	0.29
		W	0.10	0.03	0.08	0.05	0.07	0.06	0.06	0.08	0.06	0.07
	11	RS	0.92	0.27	0.77	0.72	0.72	0.72	0.51	0.77	0.64	0.72
		PS	0.01	0.73	0.30	0.24	0.26	0.25	0.46	0.20	0.35	0.26
		W	0.07	0.01	0.04	0.04	0.03	0.05	0.03	0.04	0.03	0.03

Table 2: Distribution of choices over slices by game and pie type in WSE

In addition in WSE, unlike in BSE, we do not observe much variation in RS choices across pie types.

(c) Finally, in both experiments, and consistently with the literature, RS is chosen less often in games with a constant degree of conflict than in PC.

The patterns highlighted above are supported by a more formal statistical analysis on RS choices. We run three sets of logit regressions with clusters at the subject level. For all regressions we report the marginal effects. In all sets the dependent variable takes value one if subjects choose RS and zero otherwise.

In WSE, we report instead an average of 85% and 77% in each case. For similar games, in Isoni et al. (2013), percentages of label salient choices are about 62%, 52% and 54% for degrees of conflict analogous to $A2$, $A3$, and $A4$ respectively. Comparable results are also found in Sitzia and Zheng (2019).

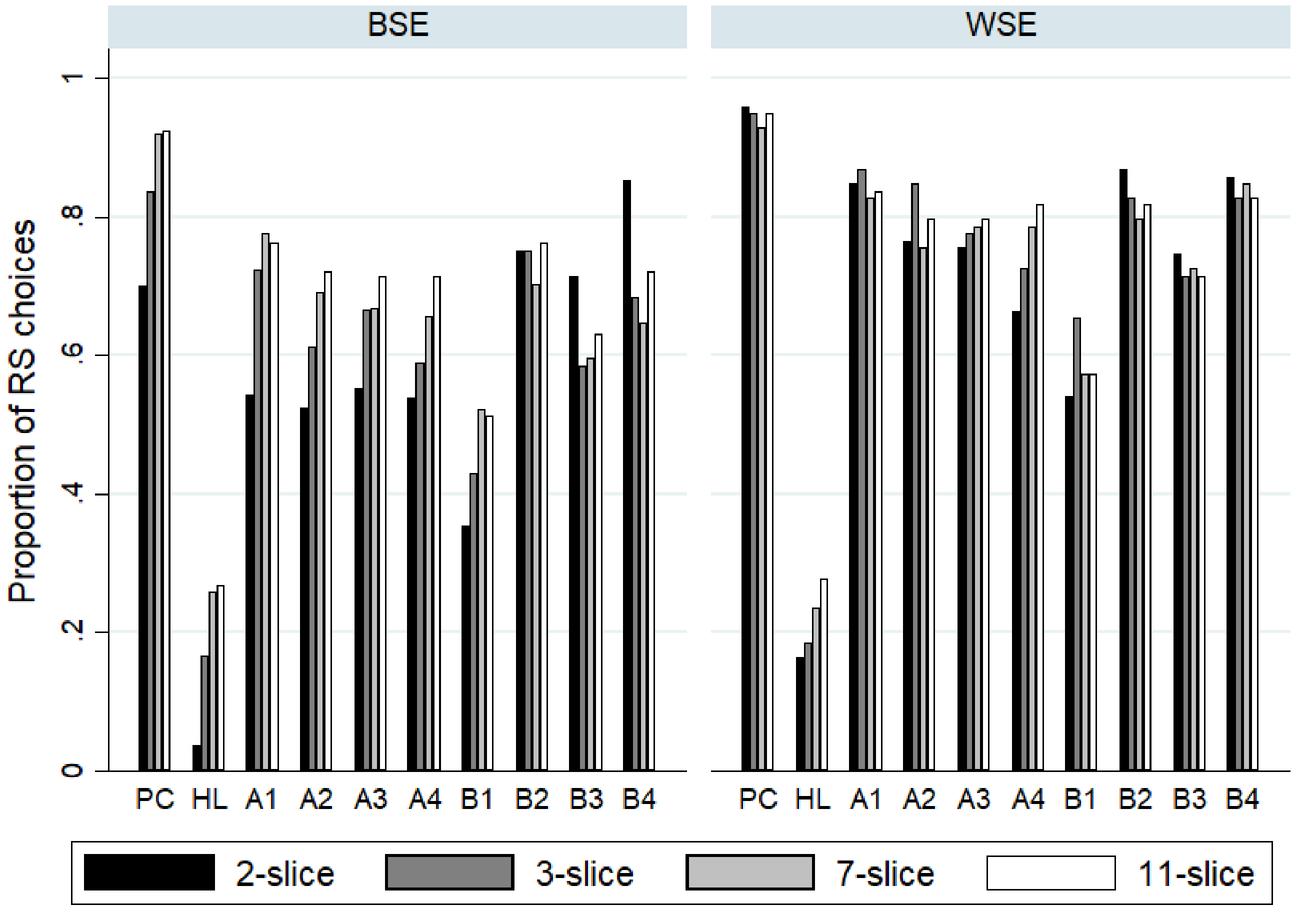

Figure 2: Proportion of *RS* choices by game and pie type

4.2 The effect of salience on *RS* choices

In the first set of models (see Table 3) we analyse the overall effect of salience on *RS* choices including all controls. As independent variables we employ indicator variables for: the experiments (*Experiment* WSE, which takes value one for experiment WSE and zero otherwise); the pie types (with the *2-slice* pie as baseline); the games, with *PC* as baseline. Finally, we employ *Period* to control for experience effects. Model (1) and model (2) include only the BSE and WSE data, respectively. Model (3) uses both sets of data.

In model (1) the estimated margins of the indicator variables for the number of slices are positive, in line with both pattern (a) and our main hypothesis. In model (2) increasing the number of slices does not lead to a significant change on *RS* choices. In model (3) the variable *Experiment* WSE is positive and significant, suggesting an expected stronger effect of salience of *RS* in this experiment. Both these results are consistent with pattern

	(1) *BSE*	(2) *WSE*	(3) *All*
Experiment WSE			0.112***
			(0.027)
3-slice	0.048	0.019	0.039
	(0.042)	(0.016)	(0.029)
7-slice	0.088**	0.004	0.063**
	(0.041)	(0.018)	(0.029)
11-slice	0.117***	0.021	0.085***
	(0.045)	(0.020)	(0.030)
HL	-0.662***	-0.734***	-0.685***
	(0.029)	(0.037)	(0.023)
$A1$	-0.142***	-0.101***	-0.129***
	(0.021)	(0.028)	(0.017)
$A2$	-0.208***	-0.153***	-0.191***
	(0.024)	(0.027)	(0.018)
$A3$	-0.194***	-0.168***	-0.186***
	(0.023)	(0.029)	(0.018)
$A4$	-0.222***	-0.196***	-0.214***
	(0.022)	(0.026)	(0.017)
$B1$	-0.389***	-0.371***	-0.382***
	(0.026)	(0.040)	(0.022)
$B2$	-0.101***	-0.117***	-0.107***
	(0.024)	(0.026)	(0.018)
$B3$	-0.211***	-0.222***	-0.214***
	(0.029)	(0.036)	(0.023)
$B4$	-0.117***	-0.108***	-0.114***
	(0.029)	(0.031)	(0.022)
Period	0.001***	0.003***	0.002***
	(0.0004)	(0.0007)	(0.0004)
# Obs.	8,400	3,920	12,320

Note: The dependent variable is the dummy variable for *RS* choice. Standard errors are clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 3: Marginal Effects

(b). Finally, in line with pattern (c), the estimated margins for $A1 - A4$ are negative and significant. This confirms the negative impact of conflict of interests on *RS* choices. We will provide a more detailed analysis on this later on. For the moment, we want to highlight these two results:

Result 1 *In line with our hypothesis, we find that as salience increases, RS is chosen more often.*

Result 2 *This salience effect is maximal in WSE than in BSE.*

One alternative explanation consistent with Result 2 is that subjects do not pay attention to the payoffs and choose RS as a default rule in WSE. However, we can rule this out as in HL the modal choice is the payoff-dominant slice PS. Thus, we can conclude that subjects, in choosing RS deliberately, are responding to the experimental monetary incentives.

Games with a constant degree of conflict. The regression analysis presented here will offer some insights on how the change of salience affects behaviour in games with a constant degree of conflict. In these games the sum and the difference of players' payoffs is the same across slices. As independent variables we employ *Experiment* WSE, *Period*, the number of slices that features in a pie, i.e., *# Slices*, and the absolute difference in player's payoffs, i.e., *Payoff Difference*. Table 4 provides the marginal effects for BSE, WSE and both experiments.

	(1) BSE	(2) WSE	(3) *All*
Experiment WSE			0.131***
			(0.028)
# Slices	0.019***	0.003	0.014***
	(0.006)	(0.002)	(0.004)
Payoff Difference	-0.014***	-0.014***	-0.014***
	(0.002)	(0.002)	(0.001)
Period	0.001*	0.003***	0.002***
	(0.0005)	(0.001)	(0.0005)
# Obs.	4,200	1,960	6,160

Note: The dependent variable is the dummy variable for *RS* choice in games *PC* and $A1 - A4$. Standard errors are clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Marginal effects in PC, $A1 - A4$

In line with our hypothesis, the marginal effect of *# Slices* is positive and strongly significant in BSE, while it is not in WSE. This lack of significance in WSE indicate that salience variations across pies do not influence behaviour in this experiment. Furthermore, we find that the RS slice is chosen significantly more often in WSE than in BSE (see *Experiment* WSE in model (3) results). These two results together are compatible with the intermixed-blocked effect as well as behavioural spillovers. Notice that the difference in behaviour between the two experiments cannot be explained by experience, as the number of games in both experiments is the same and we control for time effects including the variable

Period in all models. Finally, the degree of conflict influences negatively the probability of choosing RS. The marginal effect of *Payoff Difference* shows that one unit increase of the difference in payoffs decreases RS choices by 1.4%.

These results are robust to different model specifications and when we break down the analysis by player (see Appendix A.2). For example, Figure 3 presents the margins and the 95% confidence intervals of PC and $A1 - A4$ of a model that includes # *Slices* and *Payoff Difference* allowing now for quadratic effects of these two variables, and interactions terms (# *Slices* × *Payoff Difference*). The likelihood of choosing RS decreases when the degree of conflict increases and increases when the number of slices increases. In addition, we also observe a higher proportion of RS choice in WSE than in BSE. See Appendix A.2 for further details.

Result 3 *The conflict of interest affects negatively RS choices but this effect is reduced when salience increases.*

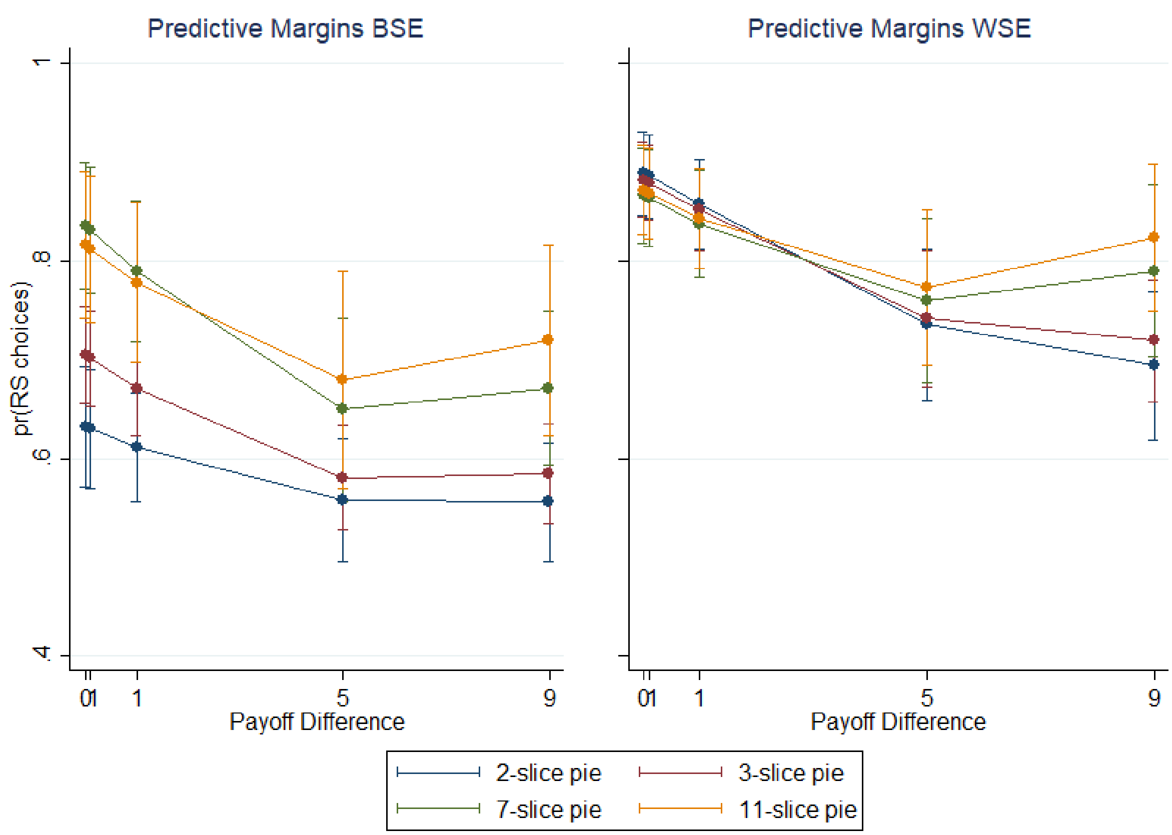

Figure 3: Predicted Margins PC and $A1 - A4$

Other games. So far, we have focused on PC and games with a constant degree of conflict, as these games allow for a controlled test of how conflict affects RS choices as the salience of RS increases. Games HL and $B1-B4$ are useful to explore the effect of a change on salience on RS choices in the presence of other payoffs considerations. These include: a payoff dominant equilibrium that does not coincide with the payoff-irrelevant focal point (HL); different degrees of inequality in players' payoffs across equilibria (i.e. difference in players' payoffs in each coordinated outcome); and different degrees of payoff efficiency (i.e. the sum of players' payoff in each coordinated equilibrium) across equilibria. Therefore, we run a third set of regressions with *Experiment* WSE, *# Slices*, indicator variables controlling for the characteristics of the different games, and Period as independent variables. These results are presented in Table 5.

	(1) BSE	(2) WSE	(3) *All*
Experiment WSE			0.091*** (0.03)
# Slices	0.005 (0.005)	-0.0002 (0.002)	0.030 (0.004)
HL	-0.273*** (0.026)	-0.365*** (0.04)	-0.303*** (0.022)
$B2$	0.288*** (0.025)	0.251*** (0.038)	0.275*** (0.021)
$B3$	0.179*** (0.024)	0.147*** (0.034)	0.168*** (0.019)
$B4$	0.273*** (0.024)	0.261*** (0.037)	0.268*** (0.02)
Period	0.001** (0.0005)	0.003*** (0.0009)	0.002*** (0.0005)
# Obs.	4,200	1,960	6,160

Note: The dependent variable is the dummy variable for RS choice in games HL and $B1-B4$. Standard errors, in round brackets, are clustered at the individual level *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Marginal effects in HL, $B1-B4$

The results show that the size of both marginal effects of *Experiment* WSE and *# Slices* are smaller than in games PC, $A1-A4$. The predicted margin for *Experiment* WSE is still strongly significant while it is not for *# Slices*. This indicates that label salience matters less in the presence of inequality between players' payoffs and/or efficiency (see, for example, Faillo et al., 2017; Galeotti et al., 2019, for the importance of payoff inequality and efficiency on coordination without labels). These results remain robust when we run the same analysis by player (see Appendix A.2).

Result 4 *When there are other payoff-considerations such as inequality or efficiency, salience matters less.*

To summarise, our results show that, in line with the literature, an increase in conflict of interest reduces the power of the focal point but also that, in line with our hypothesis, an increase in salience leads to an increase in the proportion of RS choices (see results in Table 4). This increase, maximal in WSE, leads to an unparalleled success of salience in coordination games with conflicts of interest (see footnote 7).

4.3 Coordination

In this subsection, we analyse how increasing the salience of RS affects coordination rates.

Let us define the expected coordination rate (ECR) as the probability that two randomly selected players $P1$ and $P2$ choose the same slice j for a given game and pie type.

$$ECR = \sum_j \frac{n_{1j}}{N_1}\frac{n_{2j}}{N_2} \tag{1}$$

The ratios $\frac{n_{1j}}{N_1}$ and $\frac{n_{2j}}{N_2}$ indicate the proportion of $P1$ and $P2$ choosing slice j. In PC and HL, in which the distinction between $P1$ and $P2$ is not relevant, we pooled the data and matched a randomly selected player with all other players' except for herself. Therefore, the ECR in expression (1) collapses into the same ECR in Mehta et al. (1994).

Table 6 reports the ECR in WSE (top panel) and BSE (bottom panel) for every game and pie type. As a benchmark, we also report the expected coordination rates relative to the Mixed Strategy Nash Equilibrium ($MSNE$) for the 2-slice pie.

For each game and pie type, to test differences in ECRs between pie types, we generated 10,000 simulated datasets (with the same number of observations as the experimental dataset) by repeatedly sampling with replacement from the actual distribution of choices. In this way we obtain 10,000 ECRs. From the distribution of bootstrapped ECRs, we derive confidence intervals which allow us to verify whether the observed ECR for the same game but for a pie with a larger number of slices lies within such interval. If it does, then no significant difference is observed. Otherwise, differences in ECR are significant (see Bardsley et al. (2010); Sitzia and Zheng (2019) for applications of the same test).

The results of these tests, for each experiment, appear at the bottom of the corresponding panel in Table 6. In WSE, the results show that increasing the number of slices does not, in general, affect coordination. This should be expected given the lack of variation of RS

			PC	*HL*	*A1*	*A2*	*A3*	*A4*	*B1*	*B2*	*B3*	*B4*
	RS (*W*)		(10,10)	(10,10)	(10.1,10)	(11,10)	(13,8)	(15,6)	(12,9)	(11,10)	(20,10)	(18,12)
	PS		(10,10)	(11,11)	(10,10.1)	(10,11)	(8,13)	(6,15)	(10,11)	(9,12)	(10,11)	(10,11)
	MSNE (2-slice)		0.500	0.501	0.500	0.499	0.472	0.408	0.495	0.495	0.492	0.506
WSE	2-slice		0.92	0.72	0.74	0.64	0.62	0.54	0.50	0.77	0.62	0.75
	3-slice		0.90	0.70	0.77	0.74	0.65	0.58	0.53	0.70	0.58	0.70
	7-slice		0.86	0.62	0.69	0.61	0.64	0.64	0.51	0.65	0.58	0.73
	11-slice		0.90	0.60	0.71	0.66	0.66	0.68	0.51	0.69	0.59	0.70
		SL 3>2				**						
		SL 7>2						**				
		SL 11>2						***				
		SL 7>3										
		SL 11>3						**				
		SL 11>7										
BSE	2-slice		0.58	0.93	0.50	0.50	0.49	0.49	0.54	0.62	0.58	0.74
	3-slice		0.71	0.68	0.57	0.47	0.50	0.42	0.40	0.60	0.46	0.53
	7-slice		0.84	0.57	0.63	0.54	0.51	0.50	0.46	0.54	0.46	0.50
	11-slice		0.85	0.59	0.61	0.58	0.57	0.57	0.46	0.62	0.52	0.57
		SL 3>2	***	###	***	##		###	###		###	###
		SL 7>2	***	###	***	***			###	###	###	###
		SL 11>2	***	###	***	***	***	***	###		##	###
		SL 7>3	**	##		*		**	##			
		SL 11>3	**	#		***	*	***	##		*	
		SL 11>7						**		*	*	*

Note: Significance in line with a positive effect of *RS* is indicated as follows *** p<0.01, ** p<0.05, * p<0.1. Significance in the opposite direction is indicated as follows ### p<0.01, ## p<0.05, # p<0.1.

Table 6: Expected Coordination rates

choices across pie types. In BSE, coordination rates in most games increase as the number of slices increases. The only systematic negative effects arise in HL and $B1 - B4$. In HL an increase in the salience of RS has a negative impact on coordination in both WSE and BSE. This is because label salience and payoff dominance suggest different slices. As payoff-dominance is a successful coordination rule, increasing label salience reduces its effectiveness as the proportion of RS choices increase. In games $B1 - B4$ we find similar results. This suggests that in the presence of payoffs considerations other than conflicts of interest, strong label salience is not necessarily desirable.

5 Conclusions

Schelling (1960) showed that individuals are capable of successfully coordinate their expectations making use of payoff-irrelevant features of a strategic situation. Recent experimental evidence, however, has shown that Schelling's results were too optimistic. An ever so small conflict of interests between parties is capable of destroying the coordinating effect of focal points. We have advanced the conjecture that, increasing the salience of the focal point increases its relevance as a solution concept. This in turn leads to a greater coordination success not only when the degree of conflict is small but also when it is large. In line with

Schelling (1960) we find limited evidence of coordination failure when focal points are very salient, although the negative effect of conflict on coordination is still present. When the salience of the focal point is low, our results are in line with Crawford et al. (2008) findings.

In this paper we showed that the limitations of focal points in games with conflict, documented in the literature, are not necessarily at odds with Schelling's theory of focal points. It is not enough however for a focal point to be present, it has to be sufficiently salient to be recognised as a solution.

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A Appendices

A.1 Experimental Instructions

The instructions for the within-subjects (experiment 1) and the between-subjects (experiment 2) are identical. The only change is the pie types shown. Instructions here corresponds to the 3-slice pie treatment in experiment 2.

Experimental Instructions

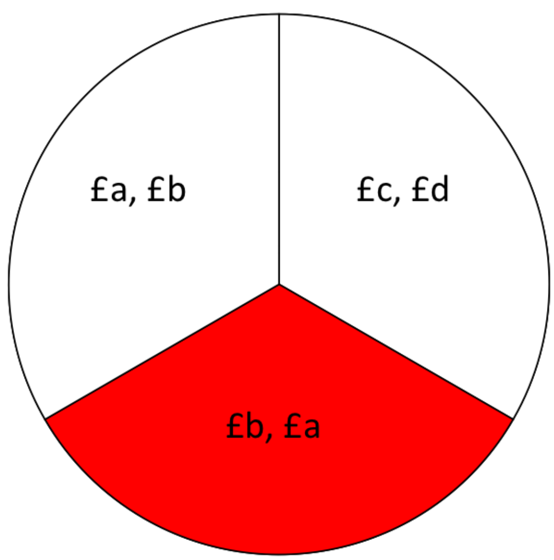
Welcome to this experiment in decision making.

We kindly ask you not to talk for the entire duration of the experiment. If you have any question at any time, please raise your hand and the experimenter will go to your desk.

In this experiment, you will be presented with a series of 40 tasks. In each task you will be matched with another person in the room. You will not be told who this person is. Your earnings will depend both on your decision and the decision of the other person. You will receive feedback only at the end of the experiment.

The Task

In each task, you and the other person will be presented with the same pie, like the one shown below, and asked to choose one slice by clicking on your choice.



In each slice there are two amounts, represented by letters in the pie above. If you and the other person **choose a different slice**, you both earn nothing in that task. If instead you and the other person **choose the same slice**, you will earn the amount on the left of the comma of the chosen slice while the other person will earn the amount on the right. In the actual experiment the letters will be replaced by numbers.

How do you earn money?

You will receive a show-up fee of £2 pounds. In addition, at the end of the experiment the computer will randomly select one of the 40 tasks and the payment will be determined as explained above. Thus, since you do not know which task will be selected at the end of the experiment and who you are matched with in that task, it is in your best interest to treat each task independently. In addition, in the actual experiment, the amounts displayed will vary from task to task. It is therefore in your best interest to inspect carefully the amounts displayed in every slice of the pie before making a choice.

A.2 Robustness Checks

	BSE P1	*BSE P2*	*WSE P1*	*WSE P2*	*All P1*	*All P2*
Experiment WSE					0.141***	0.136***
					(0.036)	(0.044)
# Slices	0.014*	0.022***	0.005	0.002	0.011**	0.016***
	(0.007)	(0.007)	(0.004)	(0.004)	(0.005)	(0.005)
Payoff Difference	0.005**	-0.016***	-0.003	-0.014***	0.002	-0.016***
	(0.002)	(0.002)	(0.003)	(0.004)	(0.002)	(0.002)
Period	0.002**	-0.0002	0.003**	0.003**	0.002***	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
# Obs.	1,680	1,680	784	784	2,464	2,464

Note: The dependent variable is the dummy variable for RS choice only in games $A1 - A4$ (as in PC, there are no asymmetries to distinguish between players). Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A1: Marginal effects in $A1 - A4$ by player

	BSE P1	*BSE P2*	*WSE P1*	*WSE P2*	*All P1*	*All P2*
Experiment WSE					0.102***	0.112***
					(0.037)	(0.040)
# Slices	-0.003	0.004	-0.005	-0.001	-0.004	0.002
	(0.007)	(0.007)	(0.004)	(0.004)	(0.004)	(0.005)
$B2$	0.293***	0.283***	0.252***	0.252***	0.277***	0.274***
	(0.029)	(0.029)	(0.047)	(0.048)	(0.025)	(0.025)
$B3$	0.217***	0.141***	0.166***	0.129***	0.199***	0.137***
	(0.028)	(0.028)	(0.047)	(0.043)	(0.024)	(0.023)
$B4$	0.259***	0.286***	0.251***	0.272***	0.255***	0.282***
	(0.029)	(0.030)	(0.048)	(0.053)	(0.025)	(0.026)
Period	0.002**	0.002*	0.005***	0.001	0.003***	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
# Obs.	1,680	1,680	784	784	2,464	2,464

Note: The dependent variable is the dummy variable for RS choice only in games $B1 - B4$ (as in HL, there are no asymmetries to distinguish between players). Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A2: Marginal effects in $B1 - B4$ by player

	BSE	*WSE*
# Slices	0.028***	0.003
	(0.008)	(0.003)
Payoff Difference	-0.020***	-0.017***
	(0.002)	(0.002)
Period	0.001*	0.003***
	(0.001)	(0.001)
# Obs.	4,200	1,960

Note: The dependent variable is the dummy variable for *RS* choice in games *PC*, $A1 - A4$. Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A3: Marginal effects in *PC*, $A1 - A4$