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THE MORE THE BETTER! INCREASING LABEL SALIENCY AS A WAY TO INCREASE COORDINATION. AN EXPERIMENTAL INVESTIGATION.

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The More the Better!
Increasing Label Saliency as a Way to Increase Coordination. An Experimental Investigation*

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We report an experiment that investigates whether increasing the saliency of the focal point, increases coordination success in tacit coordination and bargaining games. We find unexpectedly high coordination rates not only when the degree of conflict is small but also when it is large. This provides supports to the conjecture that conflict of interests reduces the saliency of the focal point relative to saliency of the payoffs, and because of this, even small payoffs differences lead to significant mis-coordination. Increasing the saliency of the focal point has the effect of drawing attention away from the conflicting payoffs and towards the focal point, restoring its effectiveness as coordination devices. Increased saliency has also the effect of shifting choices from less to more unequal, and sometimes more efficient, outcomes. This results in greater coordination success on the outcome suggested by the payoff-irrelevant cue. Overall coordination success however does not increase.

Keywords: Focal points; Coordination; Conflict of interest; Payoff-irrelevant cues.
JEL Codes: C78; C91;

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1. INTRODUCTION

In his influential book, (Schelling 1960) introduced the concept of *focality* as a powerful coordination device. His “unscientific sample of respondents” provides evidence that individuals indeed use salient cues to solve complex coordination problems that the rational *homo oeconomicus* can only hope to solve by chance. When presented with the question “Write some positive numbers. If you all choose the same number, you win”, two fifths of respondents chose number one. While this proportion seems small, standard game theory cannot do better than predicting a coordination success of zero. Schelling argues that individuals, making use of some salient features of the game, that do not carry any payoff-relevant information, can concert their expectations and successfully coordinate on a salient equilibrium, that is, the *focal point* of the game. These features of the game, which we will call *payoff-irrelevant cues*, are ways in which strategies are labelled. These can be words, shapes, position, and so on. As a result of this labelling, it is possible that one strategy (or label) stands-out and by virtue of this saliency suggests itself as the obvious solution to the coordination problem. In the game “heads and tails” Schelling asked pairs of students to name either “heads” or “tails”. If both students in each pair named the same word they would earn a prize. Schelling’s results provide evidence that the labels “heads” and “tails” helped students to coordinate more often than if they chose randomly as “[h]eads apparently beat tails, through some sense of conventional priority” (Schelling 1957, p. 26).

“Choose a number” and “heads and tails” are examples of what Schelling calls *tacit coordination games*. These are two-player pure coordination games characterized by the presence of multiple Nash equilibria in which payoffs are identical for both players and in all equilibria. Coordination occurs when the same strategy is chosen by both players. In case of mis-coordination, that happens when players choose a different strategy, payoffs are zero. Mehta et al. (1994) are the first ones to use a "scientific sample" of respondents to experimentally test Schelling’s theory. They employ a series of pure coordination games with payoff-irrelevant cues. Confirming Schelling’s results, Mehta et al. (1994) find that their experimental subjects were able to achieve levels of coordination well above those predicted by uniform randomisation of strategies. Their results have been replicated among others by Bardsley et al. (2010), Hargreaves et al. (2017), etc.

One might reasonably ask, if the power of focal points is only limited to situations in which players' interests are perfectly aligned, as in pure coordination games, or if it also extends to games in which interests diverge. These games, named by Schelling *tacit bargaining games*, are mixed-motive coordination games in which players have a common interest in coordinating but conflicting interests over which equilibria they prefer to coordinate on.[1] In these games, players' payoffs differ across equilibria so that, for one player, payoffs are greater in some equilibria and lower in others, and for the other player the reverse holds true. Schelling argues, and provided evidence for, that even when interests are not aligned, focal points maintain their power as coordination devices. However, the experimental results reported by Crawford et al. (2008) challenge the generality of Schelling's theory. While in pure coordination games focal points are shown to be quite effective, their power is greatly diminished when interests between players diverge even minimally. Parravano and Poulsen (2015) and van Elten and Penczkyski (2020), employing the same games as Crawford et al. (2008), have corroborated this finding.

In this paper we ask whether it is possible to restore the power of payoff-irrelevant cues in games with conflict of interests, by exogenously increasing the saliency of the focal point. If the coordination failure reported in the literature is due to players' decisions being driven by payoffs' concerns only, then varying the saliency of the payoff-irrelevant cues should not matter. This is implicitly assumed in the Level-k model employed by Crawford et al. (2008), in which saliency only serves as a tie-breaker. In this model players' levels of strategic sophistication differ. The least sophisticated player, level-0, is assumed to choose the strategy with the higher payoff for themselves with probability $p > 1/2$ (i.e. they have a *payoff bias*) – see Hargreaves et al. (2014) for a discussion of the role of level-0. If payoffs do not differ (as in pure coordination games) they follow with probability $p > 1/2$ the label-salient strategy (*salience bias*). Higher level players best respond to players that are one level

[1] In the extreme, when interests are completely opposed, Schelling (1960) claims that payoff irrelevant cues should be ignored. However, they are not (e.g. Rubinstein and Tversky 1993, Chowdhuri et al. 2016).

below theirs. So, level-1 players best-responds to Level-0 players, level-2 best-respond to level-1 etc. Label salience enters the model only when payoffs for both players do not differ. This model then can explain coordination in pure coordination games by virtue of a *salience bias* and mis-coordination in games with conflicting interests by virtue of a *payoff bias*.

It is however possible that, whereas decisions are influenced by payoffs' concerns, they are so inasmuch as the introduction of the conflict of interests in the game obfuscates the saliency of the payoff-irrelevant cues. Players' attention is drawn towards the conflict and away from salient label, and this leads to large coordination failures as the ones observed by Crawford et al. (2008). Isoni et al. (2013) report the results of an experiment that implements a novel game, the bargaining table, that, they claim, better represents the tacit bargaining games that Schelling had in mind. In the bargaining table, players are asked to choose or "claim" one or more discs laid on table. They can claim as many or as few discs as they like. If they choose different discs, both players earn the sum of the monetary values each disc they claim is worth. Their results show that, when interests are not aligned, coordination success is lower than when interests are aligned, however the coordination success in these games is higher than what Crawford et al. (2008) find. Isoni et al. (2013) suggest that this is so because the bargaining table is framed more in terms of a real bargaining problem where players have to agree on a division of some valuable assets. The focus in the game is more on what a player wants to claim for themselves than on what the other player is to get. Conversely, in the games employed by Crawford et al. (2008), players have to choose among distributions of payoffs which makes the payoffs, and consequently the conflict of interest, more salient. The power of focal points is therefore reduced by the increased saliency of the payoffs relative to the saliency of the payoff-irrelevant cues. Further supporting evidence to this conjecture is provided in both (Crawford et al. 2008; Isoni et al. 2013). In their experiment, a substantial proportion of subjects, when the difference between players' payoffs is small, choose the strategy with the lower payoff for themselves (the so-called *after you* effect). This suggests that, while subjects want coordinate, even if this means earning less in case of successful coordination, they fail to use label saliency in guiding their decisions. An increase in label saliency, other things being equal, can thus have the effect of drawing attention back to the focal point and away from the conflict.

While for Level-*k*, changes in the degree of label saliency has no consequence in terms of predictions, this is not the case for the theory of team reasoning (Sugden 1995). Team reasoning assumes that players will reason to find a rule that, if all members of the team follow, maximises the chances of coordination. In coordination games, payoff-irrelevant cues, when present, allow for the identification of such a unique rule. However, if the focal point becomes relatively less salient when conflict of interest is introduced, finding the rule might prove difficult. Team reasoning then, inasmuch as increasing label saliency makes it easier to find the *best rule*, predicts greater coordination success. It is of course possible that

We want to clarify at this stage that the purpose of our experiment is not that of testing these two theories, but that of furthering our understanding of why conflict of interests has such a negative impact on the coordinating power of payoff-irrelevant cues. If real world bargaining and coordination are affected by payoff-irrelevant cues, then it is important to understand under which conditions they are used as solutions concepts to solve coordination problems. Our results suggest that, if payoff-irrelevant cues are salient enough, less attention is placed on the conflicting interests and, as a consequence, the ability to reach an agreement is increased. If instead payoff-irrelevant cues are not salient enough, compared to the saliency of the conflict, then disagreement and mis-coordination are more likely to occur.

Isoni et al. (2018) conjecture, along similar lines, that the conflicts of interest might obfuscate the saliency of the payoff-irrelevant cues and inhibit team reasoning. They test this conjecture in a diametrically opposed way as we do. Instead of experimentally manipulating the saliency of the payoff-irrelevant cues, they manipulate the saliency of the conflict between players. In their experiment, players sometimes have information only about their own payoff and in some other cases they do not know even know that. This feature of their experiment, they argue, is more representative of real-world situations where players may not know what the payoffs of the other players are and, in some cases, they might not even be sure about their own one. Their experiment employs bargaining table games where players are asked which disc(s), out of two, they want to take for themselves. Each disc is split in two halves and contains information about players' payoffs. One half of the disc reports one player's payoff, and the other half reports the other player's payoff. In the full information treatment, both payoffs are reported. In the partial information treatment, the other players' payoff is substituted with a question mark. This limited information on the other players' payoff should reduce the saliency of the conflict between players and lead to greater coordination on the focal point of the game. Their results show however, that even in these cases, when players have limited information about the other player's payoff, payoff-irrelevant cues are not as helpful as they are in games with no conflict of interest and complete information on the payoffs. We believe that one of the reasons why the saliency of the payoffs is not reduced is because using a question mark may even draw more attention on the discs and their value that the actual payoff would do.

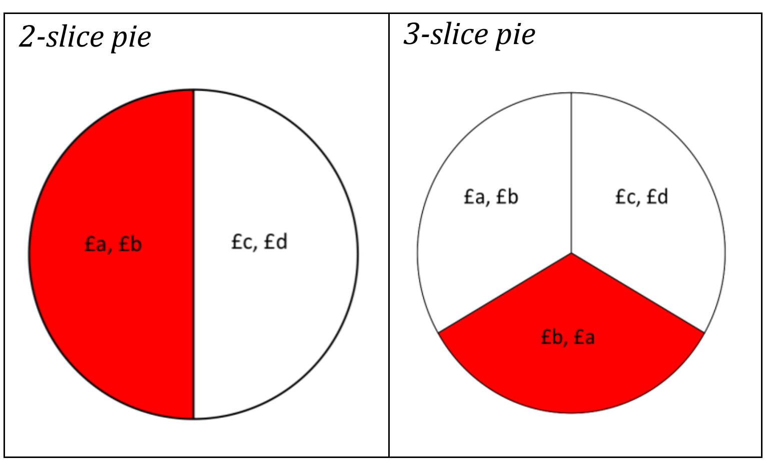
Our experimental design relies heavily on pie game employed by Crawford et al. (2008) given that this game, as conjectured by Isoni et al. (2013), might foreground the conflict of interest between players and thus seems the perfect testing bed for our hypothesis. In this game, two players are presented with a three-slice pie. Two of the slices are grey and one is white (colour is the payoff-irrelevant cue, and the white slice is the salient label). Players are required to choose a slice simultaneously and without communication. If they choose the same slice they earn some positive payoff, otherwise they earn nothing. In our experiment, we manipulate the saliency of the payoff-irrelevant cues by varying the number of slices. We employ four types of pies that have respectively two, three, seven and eleven slices. All pies have one red slice while the remaining slices are white. Contrary to what has been reported in the literature (e.g. Crawford et al. 2008, Isoni et al. 2013, Parravano and Poulsen 2015) we find little evidence of coordination failure not only when the degree of conflict is small but also when it is large. However, this is so only if subjects face tasks that involve all four different pies. If instead they only face one of the pies, coordination rates are more in line with Crawford et al. (2008).

Our results provide support to the claim that, in games with conflict of interests, participants are distracted by the strong saliency of the payoffs. If, however, the saliency of the payoff-irrelevant cue is increased, payoffs cease to be a source of distraction. Contrary to what we anticipated though, the source of saliency is not the number of slices but the variation of pies subjects face in the experiment. Additionally, we find that when the payoff-irrelevant cue suggests a more unequal distribution (which sometimes is also more efficient), increasing the saliency of the focal point has the effect of shifting choices to more unequal payoff distributions. However, because of the conflict between the saliency of the focal point and the saliency of more equal outcomes, coordination success does not increase as much compared to when the conflict is absent. This is in line with the evidence presented by (e.g. Galeotti et al. 2019) that shows that equality is a strong payoff-relevant cue and that players dislike unequal payoffs (e.g. Isoni et al. 2014).

The remainder of the paper is organised as follows. Section two will present the experimental design and section three will set out the hypotheses. Section four is devoted to the results and section five concludes.

2. Experimental Design

Our experiment involves variations of the pie game by Crawford et al. (2008). In the pie game, two players must choose simultaneously and without communication one slice. If they both choose the same slice, they both earn a positive amount. Otherwise, they earn nothing. We employ four types of pies that differ only in the number of slices: two, three, seven, and eleven slices (see Figure 1). The 2-slice pie has a red slice with monetary payoffs (a, b), which we will denote RS, and a white slice, with payoffs (c, d), which we will denote PS. Pies with more than two slices are obtained from the 2-slice pie by adding white slices, which we will denote as W, that have the same payoffs as RS. So, the 3-slice pie, the 7-slice pie and the 11-slice pie contain one, five and nine W slices, respectively.



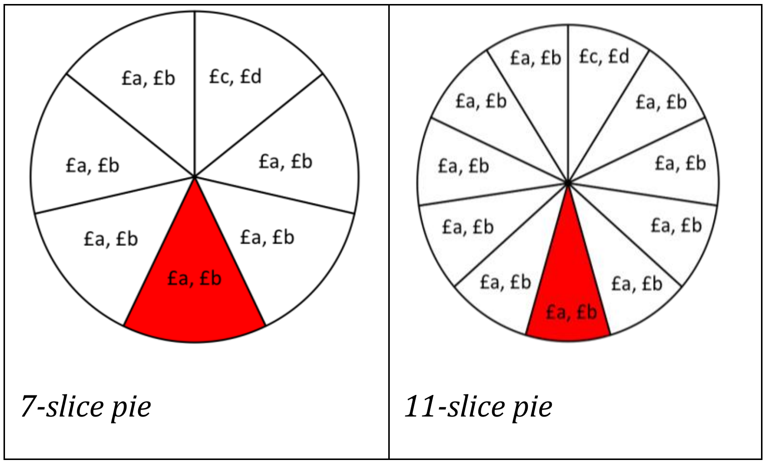


Figure 1 - Pies used in experiment

Following previous work, the only payoff-irrelevant cue in the pies is the colour. Payoff-irrelevant cues are induced to study how salience affects coordination (see Schelling 1960, Mehta et al. 1994, and subsequent experiments). A typical procedure to induce label salience in a strategic game is to attach one label to each strategy so that one stands out more. Usually players are assumed to have common knowledge of the salient properties of labels. In some games, the source of saliency comes from one label being more prominent than the others by virtue of some salient feature. For example, Crawford et al. (2008) use an allocation game in which two players have to select one allocation out of two. Allocations are identified by the labels "X" and "Y". They show that the label "X" is more salient than the label "Y". In some other games label saliency comes from one label being unique, as the 3-slice pie in Crawford et al. (2008), in which one slice is white and the other two are gray, or in Hargreaves-Heap et al. 2014 in which the unique label is defined as "oddity" (e.g. one happy face and seven unhappy ones). In games with a uniquely labelled strategy, the number of strategies is necessarily greater than two, so uniqueness relates to label frequency rather than to some salient property of the label. In our experiment, the two-slice pie has a red a white slice. Neither of the slices is unique, but research in psychology, colour physiology and neuroscience (see for a review Elliot & Maier, 2014) has demonstrated the special place 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 importance and it sticks to memory better than other colours (Kuhbandner et al.

2015)·. Because of the special properties of the colour red, we expect RS to be salient in the 2-slice pie. Research on visual systems in humans suggests that the visual saliency of an object also relates to its uniqueness and rarity, other than features such as colour, shape etc. (Jiang et al. 2013). In the 3-slice pie, RS is not only salient because is red, it is salient also because is unique. Given this, we expect it to be more salient than in the 2-slice pie. In the 7-slice pie and 11-slice pie, the rarity of RS, measured by its relative frequency, increases as well, making RS stands out even more. Thus, as the number of non-salient W slices increases, we expect RS to be more salient than in the 2 and 3-slice pies.[2]

For each pie type, we employ 10 different games. Table 1 reports the payoffs employed in each game. These games can be broadly classified into controls ($C1 - C2$), games with a constant degree of conflict ($A1 - A4$), and robustness checks ($B1 - B4$).

Payoff Pairs	*RS (W)* *(a, b)*	*PS* *(c, d)*
C1	10, 10	10, 10
C2	10, 10	11, 11
A1	10.1, 10	10, 10.1
A2	11, 10	10, 11
A3	13, 8	8, 13
A4	15, 6	6, 15
B1	12, 9	10, 11
B2	11, 10	9,12
B3	20, 10	10, 11
B4	18, 12	10, 11

Table 1: Payoffs employed in the experiment

[2] Although labels contain payoff-irrelevant information (following Schelling 1960), it can be argued that the slice PS is *payoff-salient* because it is the only slice with payoffs (c, d). Thus, following the same argument, it is possible that increasing the number of slices makes PS stand out more. However, this slice lacks the salient feature of being red.

Game *C1* (Control 1) is a *pure coordination game* in which payoffs are the same for both players in both slices RS and PS, that is $(a = b = c = d)$. This game is routinely used in the literature to elicit which label is salient. We therefore implement this game to test whether RS is perceived as such and whether the degree of saliency, as hypothesised, changes across pie types. Game *C2* (control 2) is a *hi-lo game* in which payoffs in each slice are the same for both players but they are greater in PS than in RS, that is $a = b < c = d$. Identifying subjects who do not choose the payoff dominant slice is important. When pies have 7 and 11 slices, it might happen that some subjects choose RS simply because they fail to notice PS[3], in particular in pies with a large number of slices. If, on the other hand, subjects respect payoff dominance in $C2$, we would have evidence that, in the other games, RS is not chosen as a result of inattention but of deliberate choice.

Games with conflicts of interest are games in which players have conflicting preferences over the equilibria but still prefer coordination to mis-coordination, that is, $a > c$ and $d > b$ Within this class of games, we define games with a *constant degree of conflict* across slices if in addition $a = d$ and $b = c$, and games with a *non-constant degree of conflict* all the other games. In games with a constant degree of conflict of interests, the payoff asymmetry, defined as the difference in players' payoff in each coordinated outcome, $a - b = d - c$ measures the degree of conflict between players. This in turn can be considered as a measure of how salient, and therefore distracting, the conflict is.

$A1 - A4$ are games with constant degree of conflict, similar to those in Crawford et al. (2008) and Isoni et al. (2013, 2019). The degree of conflict increases progressively from $A1$ to $A4$. Any coordinated outcome is efficient, but the difference in payoffs creates a conflict over which outcome players prefer.

$B1 - B2$ are games with a non-constant degree of conflict in which label salience is coupled with more unequal payoffs in $B1$ and the reverse in $B2$. In $B3$ and $B4$, PS has the same payoffs as PS in $B1$ but different players' payoffs in RS. $B3$ is a game with a non-constant degree of

[3] Both level-k theory and team reasoning, that are commonly used to explain behaviour in coordination games with focal points, would require players to select PS in C2.

conflict in which total payoffs are greater in RS than in PS. Coordination on RS would be to the advantage of one player but not to the other one. $B4$ highlights a trade-off between dominance and inequality. RS payoffs are greater for both players than PS ones but payoff inequality increases as well.

In the experiment, all combinations of pie types and games were implemented within-subject. Each participant faced 40 games in a randomized order (4 types of pies times 10 games). To avoid creating additional label cues that could arise from the relative position of the slices (Blume and Gneezy, 2010), in pies with more than three slices, RS and PS were kept apart, as illustrated in Figure 1. For the same reason, the pies were randomly rotated across participants. The amounts that could be earned in the case of successful coordination was reported on each slice. The discoordination payoffs were also reported on the screen. Each participant was randomly paired with another participant in the room in each game and did not receive any feedback between tasks. Feedback was only provided at the end of the experiment for a randomly selected task. This task determined the earnings for the whole experiment. In addition, participants received a participation fee of £2.

The experimental sessions were run at the University of East Anglia in June 2014. We recruited, using the hRoot system (Bock et al. 2014), 98 participants from the general population of experimental subjects. The experiment was run on individual computer terminals with a zTree code (Fischbacher 2007). Upon arrival, subjects were asked to read the instruction (see Appendix A) and answer several practice questions to test their understanding of the instructions. After the practice questions were answered and any doubt clarified, the experiment started. Average earnings were around £7.61 plus the participation fee.

3. Hypotheses

To draw hypotheses on how an increase in label saliency will affect behaviour we employ the two theories that are commonly used to explain behaviour in these games, namely the level-k model (Crawford et al., 2008) and the theory of team reasoning (Sugden, 1993; Bacharach, 2006).

The version of the level-k model proposed by Crawford et al. (2008) assumes that players differ in their level of strategic sophistication. The least sophisticated Level-0 type (L0), that only exist in the mind of the higher-level players, are assumed to have a "payoff bias", in that they select the strategy associated to the outcome giving the highest payoff to themselves. When payoffs across strategies are the same, L0 use label salience as a *tie-breaker*. Higher-level types best respond to types just one level below theirs, so L1 players anchor their beliefs on the behaviour of L0 and best respond to that, L2 best-respond to L1 and so on. If we apply this model to our games, level-k predicts no effect on behaviour due to an increasing label saliency. This is because label salience in this model only works as a tie-breaker.

In pure coordination games as C1, in which payoffs between players and across strategies are the same, the model assumes that L0 chooses the label salient strategy (RS) with some probability $p>1/2$. Given this assumption, an increase in label salience, even if one were to assume to increase p, would not affect the behaviour of L1, who best respond to L0 by choosing the label-salient strategy no matter how large p is. Given that L1 chooses according to label salience, higher level players best-respond by choosing the same strategy.

In Hi-lo games with only one payoff-dominant strategy, as C2, given L0 has a payoff bias, she/he chooses the payoff dominant strategy with a probability $q>1/2$. Higher level players best-respond to lower levels by choosing the same strategy. Because label salience is only used as a tie-breaker, and there is only one payoff-dominant strategy, so not ties to break, level-k predict players will choose the payoff dominant strategy (e.g. PS in our game). Increasing the number of payoff-dominated strategies (as in 3-, 7- and 11-slice pies) does not have any effect on level-k players who, independently of which strategy is label salient, choose the payoff-dominant one.

In games in which, in each strategy, payoffs between players differ, as in A1-A4, B1-B4, L0 chooses with a probability $q>1/2$, the strategy associated to the outcome giving the highest payoff to themselves. If there is more than one such strategy, so ties to break, label salience dictate which of these strategies should be chosen. In our games, given that slices W have the same payoffs as RS, but RS is label salient, L0 players whose payoff is greater in these strategies select RS. L0 players whose payoff is instead greater in PS, choose PS. Thus, in A1-A4, B1-B4, level-k predicts that choices are distributed over RS and PS independently of how salient RS is, and therefore independently of how many W strategies a pie features.

Hypothesis 0*: Level-k predicts that changes in label-saliency will have no effect on behaviour.*

Team reasoning assumes that in strategic interactions, players consider both themselves and their co-players as a team, and ask themselves the question "What should we do?" instead of "What should I do?". In answering this question, players look for a rule (i.e. the best rule) that, if followed by all team members, maximises chances of coordination and therefore the team's payoff. The early versions of team reasoning (Sugden, 1993, 1995) assume that, *if* a collectively rational rule exists, each player will be able to identify it and follow therefore what it prescribes. Variable Frame Theory, conversely, (Bacharach and Bernasconi, 1997; Bacharach 2006), assumes that players might differ in their ability to identify coordination rules based on payoff-irrelevant attributes. Some attributes are highly available, easily noticeable, while some others are not. When the best rule is that of choosing according to the non-obvious attribute, a player, that is aware of that attribute, follows the best rule provided that the probability that the other player is aware as well is large enough.

In the pure coordination games as C1, since the payoffs between players and across equilibria are the same, a team reasoner looks for a rule that maximises the chances of coordination. This rule is to choose according to label salience (e.g. RS). Given that label cues have been shown to be extremely helpful in increasing coordination even in pies with three slices (94% subjects choose the salient slice in the experiment by Crawford et al., 2008, and 84% in Sitzia and Zheng, 2019), we present our hypothesis in a weakly form.

Hypothesis 1*. In the pure coordination games as C1, the proportion of RS choices is weakly increasing in the number of slices.*

In Hi-Lo games as C2 the best rule for the team is to choose the payoff dominant strategy (PS), because following this rule maximises both player and team's payoffs. In our experiment, payoff dominance and label salience always suggest different strategies (i.e. payoff cue and label cue are incongruent). Experimental evidence shows that in these situations, payoff cues are more powerful than label cues (Crawford et al. 2008, Chowdhuri et al. 2019, Isoni et al. 2020). However, their effectiveness, compared to games without label cues, is greatly reduced (Isoni et al., 2019 and Isoni et al., 2020). Label cues in this context seem to act as a distraction. If this is the case, increasing their salience could lead to an even further decrease in the effectiveness of the payoff dominant rule therefore to a decrease in the number of PS choices.

Hypothesis 2: *In the hi-lo game C2, the proportion of PS choices is greater than that of RS choices, and PS choices decreases as the number of slices increases.*

In games with a constant degree of conflict, such as A1-A4, the difference in players' payoff as well as their sum is the same across equilibria. In these games, the best rule for the team cannot be derived from payoff considerations, since from the team's perspective, equilibria are isomorphic (Faillo et al., 2017). The best rule is therefore to choose according to label salience. Contrary to this prediction, large coordination failures have been reported in the literature. Sitzia and Zheng (2019) conjecture that this is because conflicts of interest act as a distraction that reduces the salience of the label cues compared to that of the payoffs. A decrease in the relative salience of label cues, they explain, makes it more difficult for team members to work out the best rule, therefore reducing label salient choices. Isoni et al. (2020) demonstrate that, even when players' interests are perfectly aligned, differences in payoffs between players (Pizza night games) can reduce the effectiveness of label cues. This is consistent with the conjecture that it is not the conflicts of interest per se that lead to mis-coordination but the effect that this has on the saliency of the label cues. An increase in the saliency of label cues should then make it easier for team reasoners to identify the best rule. This leads to an increase in label salient choices.

Hypothesis 3*: In games with a constant degree of conflict (A1-A4), the relative frequency of RS choices increases as the number of slices increases.*

In games B1-B4 we ask to what extent an increase in label cue salience is robust to changes in payoff inequality and outcome efficiency measured as the sum of players' payoffs. Games B1, B2 are games with a non-constant degree of conflict in which the sum of players' payoffs is the same across equilibria but their difference is not. In game B1 the larger payoff inequality is coupled with label salience and in B2 is the opposite. Because of this, we expect that an increase in label salience will have a stronger effect in B1 than in B2.

Hypothesis 4a*: The proportion of RS choices is greater if label salience is coupled with less unequal payoffs. However, when this happens, an increase in label cue salience will only have a weak effect on the proportion of RS choices.*

B3 and B4 are games in which the sum of the payoffs in RS is greater than in PS, but players' payoffs are also more unequal. The key difference between these games is that in B3 players' interests are not aligned while in B4, an asymmetric Hi-Lo game, they are. The different degrees of inequality between RS and PS may, at least to some extent, make it more difficult for players to identify the best rule, but this difficulty should be greater in B3 because players' interests are, in addition, not aligned. We predict therefore that an increase in the saliency of label cues will have a stronger effect in B3 than in B4, as in B4 the proportion of RS choices are predicted to be greater, other things equal.

Hypothesis 4b*: When label salience is coupled with more efficient but more unequal outcomes, the proportion of RS choices is greater if in addition players' preferences between equilibria are aligned. In this case however, because there is little scope for improvement, an increase in label salience leads to a weak increase in the relative frequency of RS compared to the case in which players' interests are aligned.*

4. RESULTS

Table 1 reports the frequency of choices and expected coordination rates by pie type, slice (RS, PS and W), type of player, and payoff structures. We have labelled the two players as $P1$ (player 1) and $P2$ (player 2). $P1$ has the higher payoff on slice suggested by the payoff-irrelevant cue (RS) and W when present, and the lower payoff on PS. The expected coordination rate, which has been calculated as in Crawford et al. (2008), is the sum of the expected coordination rates on each slice. The expected coordination rate (ECR) on a slice is the product of the frequency of choices of $P1$ and $P2$. For payoff $C1$ and $C2$ the expected coordination rate is simply the sum of the products of the frequency of choices multiplied by itself on every slice. To test differences between ECR we use the same procedures employed by Bardsley et al. (2010) and Sitzia and Zheng (2019).

Result 1. In C1, the proportion of RS choices is not significantly different across pie types.

Support. The proportion of RS choices, see Figure 1, is well above 90% for all pie types employed and differences are not statistically significant across pies (McNemar's test results return p>0.45 in all possible pairwise comparisons). This only partly supports hypothesis 1.

We did not have any $apriori$ reason to believe that the RS slice was more salient than the PS in the two-slice pie, however, the results suggest that RS was not only more salient than PS (94 subject out of 98 choose RS) but it was as salient as in pies with more white slices.

Result 2. In the hi-lo game C2, for all pie types, the proportion of PS choices is always significantly greater than that of RS ones but differences between pie types are in most cases significantly different.

Support. For all types of pies subjects choose significantly more often the PS slice. Proportions of PS choices range from 72% to 84% (test of proportions, p<0.01 in all cases). We also observe across pies a systematic increase in the proportion of RS choices as the number of slices increases. Differences are significant between pies with two and seven slices, two and eleven slices, and three and eleven slices (McNemar test, $p < 0.10$, $p < 0.02$, $p < 0.04$ respectively). These results provide partial support for hypothesis 2 and it might be interpreted as indirect evidence that the saliency of RS increases with the number of slices. Isoni et al. (2018) present a model where players can adopt two distinct modes of reasoning: focal point reasoning, as suggested by Schelling (1960) and formalised by Bacharach (2006) and level-k reasoning as formalised by Crawford et al. (2008). In hi-lo games in which the payoff-dominant equilibrium (in our case slice PS) is opposed to the focal point equilibrium (the RS slice in our case) the probability of a player adopting focal-point reasoning is greater than when no focal-point equilibrium is present or when payoff-dominant equilibrium and focal-point equilibrium coincide. If the saliency of RS increases with the number of pie slices then one should expect that the probability of adopting focal-point reasoning to increase, which is what we observe. An alternative explanation, consistent with our results, is that as the number of slices increases, players do not notice the PS slices and consequently choose PS. This explanation however seems hard to reconcile with the fact that as many as 16% of the subjects in the two-slice pie chose the dominated RS. When we look at the expected coordination rates however, differences across pie types cease to be significant and this provides stronger support for hypothesis 2.

Result 3.1. In games with a constant degree of conflict, $(A1 - A4)$ we do not find evidence that subjects choose the RS slice more often as the number of slices increases.

Support. In games with a constant degree of conflict, the proportion of subjects choosing the RS slice is quite large across pies. In game A1 with payoffs (5.1, 5) RS is chosen across all pies not less than 83% of times. Differences across pies are not significant (McNemar's test). In game A2 (6, 5) the lowest proportion of RS choices is observed in the 7-slice pie (77%), in game A3 (8, 3) proportions of RS choices range from 76% in the 2-slice pie to 80% in the 11-slice pie. Differences across pies are only significantly less in game A2 for the 3-slice pie compared to the 7-slice pie (McNemar's test, $p<0.08$). Not surprisingly when the conflict large as in A4 (10,1) subjects choose less often the RS slices but proportions are still relatively large (from 66% in the 2-slice pie to 82% in the 11-slice one). We do find evidence that subjects choose significantly less often RS in the 2-slice pie than in the 7 or 11-slice pie (McNemar's test, $p<0.06$, $p<0.01$ respectively). These results do not lend support to hypothesis 4.

Result 3.2. We find that, for any give pie type, as the degree of conflict increases from A1 to A4, RS is chosen less often in the 2-slice and the 3-slice pies.

Pie type	Slice	Player	C1	C2	A1	A2	A3	A4	B1	B2	B3	B4
	RS	P1			0.84	0.80	0.82	0.73	0.57	0.86	0.73	0.92
		P2			0.86	0.73	0.69	0.59	0.51	0.88	0.76	0.80
2-slice		*Pooled*	*0.96*	*0.16*	*0.85*	*0.77*	*0.76*	*0.66*	*0.54*	*0.87*	*0.75*	*0.86*
	PS	P1			0.16	0.20	0.18	0.27	0.43	0.14	0.27	0.08
		P2			0.14	0.27	0.31	0.41	0.49	0.12	0.24	0.20
		Pooled	*0.04*	*0.84*	*0.15*	*0.24*	*0.25*	*0.34*	*0.46*	*0.13*	*0.26*	*0.14*
	RS	P1			0.88	0.82	0.80	0.82	0.67	0.80	0.73	0.84
		P2			0.86	0.88	0.76	0.63	0.63	0.86	0.69	0.82
		Pooled	*0.95*	*0.18*	*0.87*	*0.85*	*0.78*	*0.73*	*0.65*	*0.83*	*0.71*	*0.83*
	PS	P1			0.12	0.16	0.20	0.16	0.29	0.14	0.24	0.12
3-slice		P2			0.12	0.12	0.22	0.37	0.37	0.12	0.29	0.16
		Pooled	*0.03*	*0.82*	*0.12*	*0.14*	*0.21*	*0.27*	*0.33*	*0.13*	*0.27*	*0.14*
	W	P1			0.00	0.00	0.00	0.02	0.04	0.06	0.02	0.04
		P2			0.02	0.02	0.02	0.00	0.00	0.02	0.02	0.02
		Pooled	*0.02*	*0.00*	*0.01*	*0.01*	*0.01*	*0.01*	*0.02*	*0.04*	*0.02*	*0.03*
	RS	P1			0.90	0.82	0.84	0.86	0.59	0.86	0.78	0.80
		P2			0.76	0.69	0.73	0.71	0.55	0.73	0.67	0.90
		Pooled	*0.93*	*0.23*	*0.83*	*0.76*	*0.79*	*0.79*	*0.57*	*0.80*	*0.73*	*0.85*
7-slice	PS	P1			0.06	0.16	0.10	0.10	0.41	0.10	0.18	0.18
		P2			0.22	0.29	0.24	0.24	0.45	0.24	0.31	0.10
		Pooled	*0.01*	*0.76*	*0.14*	*0.23*	*0.17*	*0.17*	*0.43*	*0.17*	*0.25*	*0.14*
	W	P1			0.04	0.02	0.06	0.04	0.00	0.04	0.04	0.02
		P2			0.02	0.02	0.02	0.04	0.00	0.02	0.02	0.00
		Pooled	*0.06*	*0.01*	*0.03*	*0.02*	*0.04*	*0.04*	*0.00*	*0.03*	*0.03*	*0.01*
	RS	P1			0.90	0.78	0.84	0.88	0.55	0.82	0.76	0.80
		P2			0.78	0.82	0.76	0.76	0.59	0.82	0.67	0.86
		Pooled	*0.95*	*0.28*	*0.84*	*0.80*	*0.80*	*0.82*	*0.57*	*0.82*	*0.72*	*0.83*
	PS	P1			0.08	0.18	0.12	0.08	0.45	0.18	0.24	0.14
11-slice		P2			0.18	0.16	0.22	0.22	0.41	0.14	0.33	0.14
		Pooled	*0.01*	*0.72*	*0.13*	*0.17*	*0.17*	*0.15*	*0.43*	*0.16*	*0.29*	*0.14*
	W	P1			0.02	0.04	0.04	0.04	0.00	0.00	0.00	0.06
		P2			0.04	0.02	0.02	0.02	0.00	0.04	0.00	0.00
		Pooled	*0.04*	*0.00*	*0.03*	*0.03*	*0.03*	*0.03*	*0.00*	*0.02*	*0.00*	*0.03*
							Expected Coordination Rates					
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										

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

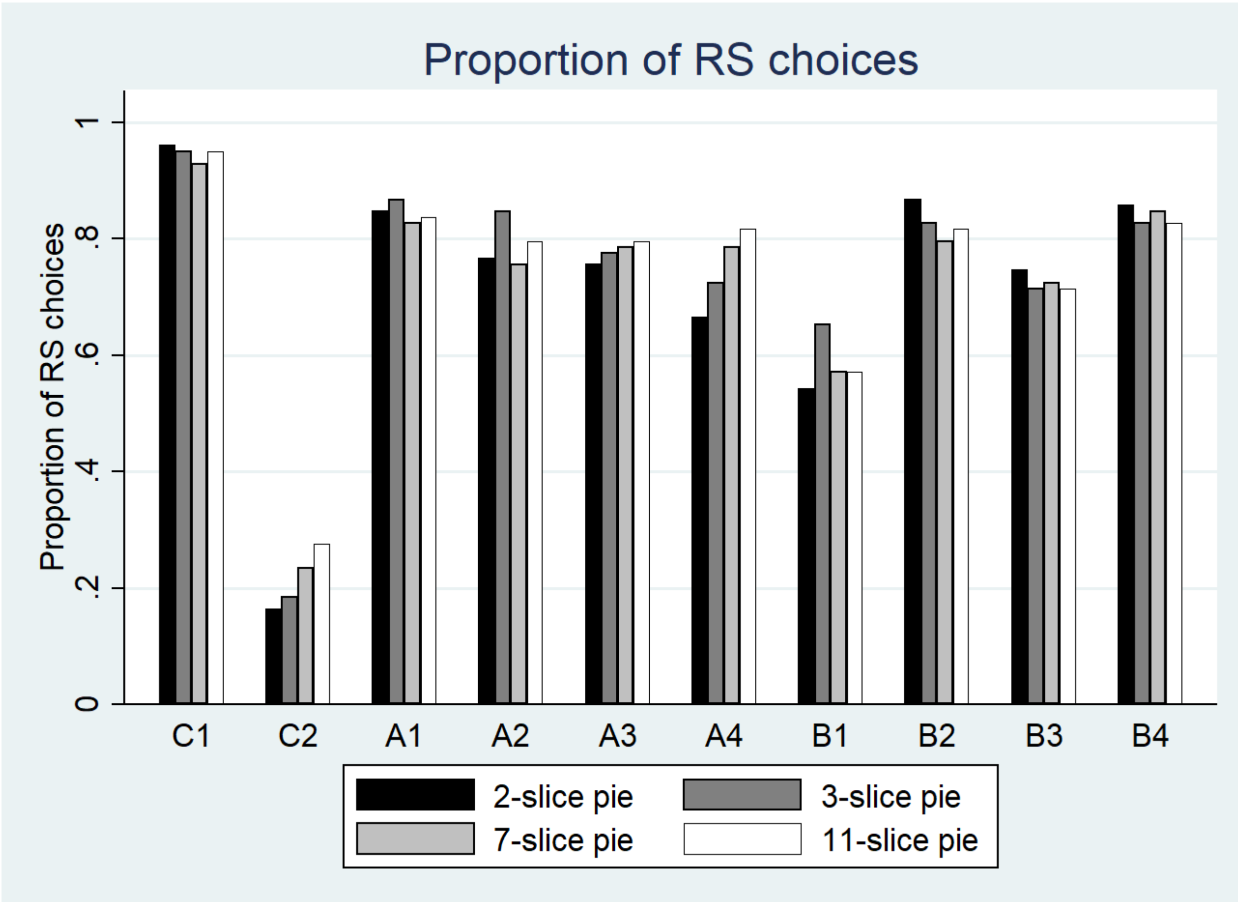


Figure 2: Proportion of RS choices by game and pie type.

Support. For any given pie type we tested whether the inequalities $f(A1_{RS}) > f(A2_{RS}) > f(A3_{RS}) > f(A4_{RS})$ hold. We have used both McNemar's test and a logit regression with RS choices as dependent variable. We employ only one independent variable that takes values from one to four in steps of one that represent the four games A1, A2, A3 and A4. McNemar's test results show that the only statistically significant differences are in the 2-slice pie between A1 and A2 (p<0.09); in the 7-slice pies between A1 and A2 (p<0.08). In the regression results, the average marginal effect is only significant in the 2-slice pie and the 3-slice pie (the probability of choosing RS decreases as the degree of conflict increase on average by about 6% and 5% respectively. The results, although only partly support hypothesis 5, provide indirect evidence that our salience manipulation has worked, given the proportion of RS choices do not statistically differ for the 7 and 11-slice pie. When we compare proportions of RS choices in these games with those observed in C1, we find that

that RS is chosen less frequently than in C1 (McNemar's test, the largest p-value for the 2-slice pie is p<0.01, the largest p-value is p<0.06 for the 3-slice pie, the largest p-value is p<0.03 for the 7-slice pie, and the largest p-value is p<0.02 for the 11-slice pie. At prima facie, our manipulation does not seem to have worked. However, we find little evidence of coordination failure.

Results 4.1. RS in B1 and B2 are chosen more often than the payoff-equivalent slices PS in B2 and B1 respectively. But increase the number of pie slices does not significantly change subjects' behaviour in the respect of RS choices.

Support. As explained Section 2, the only difference between slices RS in B1 and PS in B2 is the colour, RS is label salient while PS is not, the same holds true for RS in B2 and PS in B1. McNemar's test results reveal that the proportions of RS choices in both B1 and B2 are significantly greater than the proportions of PS choices in B2 and B1 respectively ($p < 0.001$ for all pie types). This provides support that RS is more salient than slice PS for all pie types. Additionally, if increasing the number of slices increases the saliency of the RS relative to the saliency of PS, we should observe subjects switching more often from PS in B1 to RS in B2 (as from PS in B2 to RS in B1) as the number of slices increase. In order to test this hypothesis, we have generated a variable that takes value one when subjects switch in the direction suggested by the payoff-irrelevant cues and zero if switches are in the opposite direction. We do not find evidence that neither switches from PS in B1 to RS in B2 or from PS in B2 to RS in B1 increase as the number of slices increases. This result seems puzzling. Choices of RS in B3 and B4 seem to indicate that although subjects perceive those slices as strongly salient, their saliency does not seem to be affected by the number of slices.

Results 4.2. Subjects chose more RS in B4 than in B3. But increase the number of pie slices does not significantly change subjects' behaviour in the respect of RS choices.

B4 is a hi-lo game with payoff inequality between players. If players only care about their own payoffs, they should both choose RS where payoffs are greater for both than they are on PS. If players also care about relative payoffs, that is, whether their payoff is greater than that of the other player, then, it is not obvious what they would choose. Proportion of RS choices are all above 80% for all pie types employed. While there are differences across pie types, the data do not seem to follow a clear pattern in this respect. Game B3 differs from B4 in that player 2's payoff on PS is greater than on RS, so, unlike B4, it features a conflict of interest. The conflict of interest and player 1's large payoff on RS compared to PS, lead to lower RS choices than in B4. However, we do not find strong evidence showing that increase the number of slices can change subjects' behaviour in the respect of choosing more RS slice.

The main aim of this experiment was to test whether increasing the saliency of the payoff-irrelevant cues, by increasing the number of non-salient W slices could reduce the level of coordination failure reported in the literature (Crawford et al. 2008, Isoni et al. 2013, Parravano and Poulsen 2015, Sitzia and Zheng 2019). We find extremely high proportion of RS choices across games and pie types suggesting that payoff-irrelevant cues are, in our experiment, quite powerful. The ECRs reported at the bottom of Table 1 reflect this finding. Our ECRs are substantially greater than those reported by Crawford, et al. (2008) and Sitzia and Zheng (2019), for comparable games and payoff structures.[4] We have reported some indirect evidence that our salience manipulation worked, however, a bootstrap test on ECRs confirms that the differences across pies are not statistically significant with just few exceptions. This leaves us with the question of why we observe such large proportions of RS choices and consequently of ECRs across the board. The difference in expected coordination rate between our experiment and Crawford, et al. (2008) might be driven by the different colours employed to identify the pie slices. In the pie game by Crawford et al. slices are either grey or white, white being the salient one. It is possible that red is much more a salient colour than white and this would explain why we observe a very high ECRs and in the 2-pie game where the choice is between a white and a red slice. Sitzia and Zheng (2019) use the same pie as we do and they find slightly greater ECRs than the ones in Crawford et al. (2008) but lower than what we observe. The other possible explanation lies on the different type of design used. Crawford et al use one-shot games while we use a within-subject design where subjects make 40 choices with 4 different types of pies and 10 different payoffs. Subjects in Sitzia and Zheng (2019) play as many as 11 pie games and the ECRs they observe as similar

[4] Crawford et al. find that in a 3-slice pie game with payoffs similar to what we employ in game A2 was just 31%. Sitzia and Zheng (2019) report for the same game and payoffs a coordination rate of 44%.

to those reported by Crawford et al. (2008). Finally, it is possible that the high ECRs observed in our experiment are due to subjects facing as many as four different pies with the same payoff-irrelevant cues. It might be that our manipulation was, in fact, effective, and the strong saliency of RS, in the pies with 7 and 11 slices, spilled over pies with two and three slices. To test whether our results are due to the large number of games subjects play in this experiment or to spill-over effects, we ran another experiment where the pie type has been implemented between-subject. In the next section we briefly present the design and results of this second experiment.

5. Experiment 2

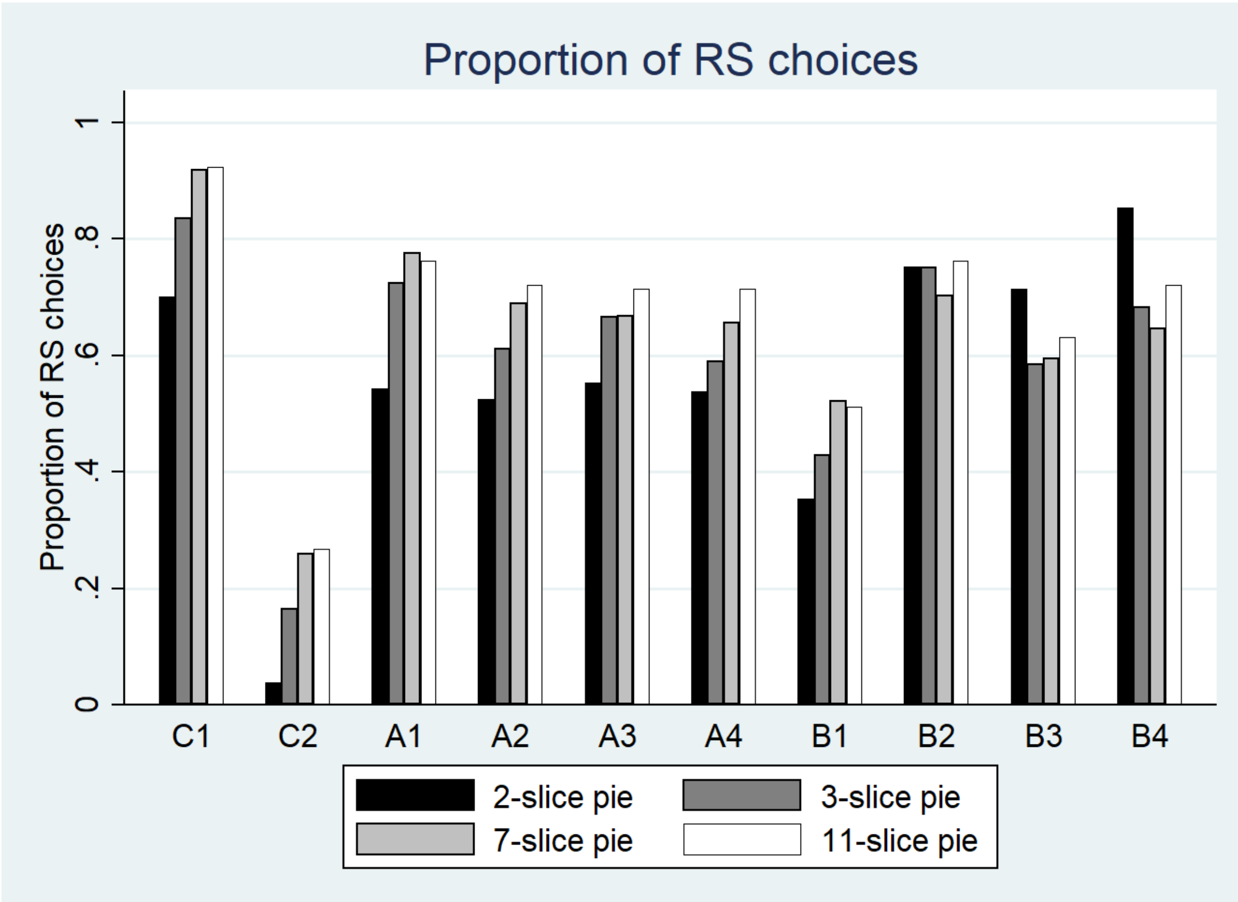
This second experiment involves four treatments that differed only for the type of pie employed. Participants faced four sets of 10 pie games. In each set, all the payoff pairs in table 1 were implemented in randomised order. Given our design, subjects were presented with the same payoff pair four times and played 40 games in total. Twice they were assigned to the role of player 1 and twice to the role of player 2. The main difference between this experiment and the first experiment, is that subjects only faced one pie type as opposed to four. We also implemented the payoff structures in sets to avoid that the same game was played twice in a row and to clearly test whether the number of tasks had an effect on the effectiveness of the payoff-irrelevant cues. If behaviour does not change across sets, then we can exclude that the high coordination rates in our experiment are due to the large number of tasks participants face.

Pie type	Slice	Player	C1	C2	A1	A2	A3	A4	B1	B2	B3	B4
2-slice	RS	P1			0.51	0.51	0.64	0.64	0.34	0.75	0.79	0.87
		P2			0.57	0.54	0.46	0.44	0.36	0.75	0.64	0.83
		Pooled	*0.7*	*0.04*	*0.54*	*0.53*	*0.55*	*0.54*	*0.35*	*0.75*	*0.72*	*0.85*
	PS	P1			0.49	0.49	0.36	0.36	0.66	0.25	0.21	0.13
		P2			0.43	0.46	0.54	0.56	0.64	0.25	0.36	0.17
		Pooled	*0.3*	*0.96*	*0.46*	*0.48*	*0.45*	*0.46*	*0.65*	*0.25*	*0.29*	*0.15*
3-slice	RS	P1			0.74	0.64	0.76	0.71	0.48	0.79	0.63	0.67
		P2			0.71	0.58	0.57	0.46	0.38	0.71	0.54	0.70
		Pooled	*0.83*	*0.17*	*0.73*	*0.61*	*0.67*	*0.59*	*0.43*	*0.75*	*0.59*	*0.69*
	PS	P1			0.19	0.27	0.17	0.18	0.41	0.13	0.27	0.22
		P2			0.21	0.31	0.35	0.48	0.55	0.20	0.40	0.25
		Pooled	*0.08*	*0.81*	*0.20*	*0.29*	*0.26*	*0.33*	*0.48*	*0.17*	*0.34*	*0.24*
	W	P1			0.07	0.09	0.07	0.11	0.11	0.08	0.10	0.11
		P2			0.08	0.11	0.08	0.05	0.07	0.09	0.06	0.05
		Pooled	*0.08*	*0.03*	*0.08*	*0.10*	*0.08*	*0.08*	*0.09*	*0.09*	*0.08*	*0.08*
7-slice	RS	P1			0.79	0.71	0.70	0.72	0.52	0.73	0.62	0.65
		P2			0.76	0.67	0.64	0.59	0.53	0.67	0.57	0.65
		Pooled	*0.92*	*0.26*	*0.78*	*0.69*	*0.67*	*0.66*	*0.53*	*0.70*	*0.60*	*0.65*
	PS	P1			0.13	0.25	0.20	0.19	0.41	0.19	0.33	0.28
		P2			0.17	0.27	0.33	0.38	0.45	0.26	0.36	0.29
		Pooled	*0.03*	*0.71*	*0.15*	*0.26*	*0.27*	*0.29*	*0.43*	*0.23*	*0.35*	*0.29*
	W	P1			0.08	0.04	0.10	0.09	0.08	0.08	0.05	0.08
		P2			0.07	0.06	0.03	0.03	0.03	0.07	0.07	0.06
		Pooled	*0.05*	*0.03*	*0.08*	*0.05*	*0.07*	*0.06*	*0.06*	*0.08*	*0.06*	*0.07*
11-slice	RS	P1			0.74	0.70	0.76	0.76	0.50	0.74	0.67	0.69
		P2			0.79	0.74	0.67	0.67	0.52	0.79	0.60	0.75
		Pooled	*0.92*	*0.27*	*0.77*	*0.72*	*0.72*	*0.72*	*0.51*	*0.77*	*0.64*	*0.72*
	PS	P1			0.25	0.27	0.21	0.19	0.50	0.24	0.32	0.27
		P2			0.14	0.21	0.30	0.30	0.42	0.15	0.38	0.24
		Pooled	*0.01*	*0.73*	*0.20*	*0.24*	*0.26*	*0.25*	*0.46*	*0.20*	*0.35*	*0.26*
	W	P1			0.01	0.02	0.02	0.05	0.00	0.02	0.01	0.04
		P2			0.07	0.05	0.04	0.04	0.06	0.06	0.02	0.01
		Pooled	*0.07*	*0.01*	*0.04*	*0.04*	*0.03*	*0.05*	*0.03*	*0.04*	*0.02*	*0.03*
							Expected Coordination Rates					
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								#	*	#

Table 3: Experiment 2: Distribution of choices over slices by game and pie type.

Notes: Significance levels in the predicted direction: $*$ = p < 0.1, $**$ = p < 0.05 and $***$ = p < 0.01. Significance levels in the opposite direction: # = p < 0.1, ## = p < 0.05 and ### = p < 0.01.

Figure 3:Experiment 2: proportion of RS choices by game and pie type.



Results 1a&2a. in games C1 and C2, RS is chosen less frequently in the 2-slice pie than in all other pie types.

Support. The results of the experiment are reported in Table 2 and Figure 2. The proportions of RS choices are also reported in Figure 2. The proportion of RS choices is positively related to the number of slices in almost all games. In line with hypotheses 1 and 2, we not do find any significant difference across pies in either C1 or in C2 differences across pies are significant except for the 2-slice pie where RS is chosen less often than in all the other pies (Mann-Whitney tests, in C1: $p<0.01$, $p<0.001$ and $p<0.001$, in C2: $p<0.01$, $p<0.001$ and $p<0.001$). We did not have any *a priori* reason to believe that RS was more salient than PS in the two-slice pie, although we do find that the red RS is more salient than the white PS as it is chosen by 70% of subjects in C1. Unlike experiment 1, in C2 only few subjects choose the dominated slice PS (4% compared to 16%). This result provides further evidence that RS is less salient in the 2-slice pie in experiment 2 and hence does not act as a disturbance to focal point reasoning as much as in experiment 2.

Result 3a. In games with constant degree of conflict (A1-A4) subjects choose significantly less RS in the two-slice pie than in the other pies, but the ECR differ across pies in the predicted direction.

Support. Unlike experiment 1, in experiment 2, for any given degree of conflict, subjects choose less frequently RS in the two slice-pie (Mann-Whitney test, $p<0.001$ in all cases for payoffs A1; $p<0.01$ in A2 for the 2-slice pie compared to 7-slice pie and 11-slice pie; $p<0.02$, $p<0.03$ and $p<0.01$ in A3 for the 2-slice pie compared to 3, 7 and 11-slice pies respectively; $p<0.02$ and $p<0.001$ in A4 for 2-slice pie compared to 7 and 11-slice pies). Despite this, we do observe, in most cases, statistically significant differences in ECRs across pies. This suggests that indeed increasing the number of slices increases the saliency of RS enough to increase coordination rates in pies with more slices compared to pies with fewer slices.

Result 4a. Although RS is chosen less frequently when the degree of conflict increases from A1 to A4, rarely differences are significant.

Support. We tested whether the proportion of RS choices by pie type decreases as the degree of conflict increases. Differences are significant only in the 3-slice pie between A1 and A2, A3 and A4 respectively (Wilcoxon test, $p<0.01$, $p<0.04$, $p<0.001$) and between A3 and A4 respectively ($p<0.001$), and in the 7-slice pie between A1 and A2, A3 and A4 respectively (Wilcoxon test, $p<0.01$ in all cases).

Results 5a. RS in B1 and B2 are chosen more often than the payoff-equivalent slices PS in B2 and B1 respectively.

Support. For all pie types, we observe significantly larger proportions of RS choices in B1 (B2) than those of PS in B2 (B1) (McNemar's test, $p<0.02$ in the 2-slice pie and $p<0.001$ for all other pies). This is suggestive of the fact that the RS slice is more salient than the PS slice for all pie types. We do not however observe significant differences of RS choices across pies except in the 2-slice pie where the RS is chosen less frequently in B1 than it is when the number of slices are 7 or 11 (Mann-Whitney test, $p<0.02$ and $p<0.06$ respectively).

Result 6. ECRs differ across pie-types for games with a constant degree of conflict A1-A4.

Support. Using a bootstrap procedure, we find that ECRs differ across pie types in most cases (see bottom of table 2). So, although differences in RS choices are in most cases not significant across pies, they are large enough to lead to differences in ECRs. This provide some evidence that increasing the number of slices does seem to increase the saliency of RS.

6. Explaining coordination success

We have provided some evidence that increasing the number of slices does have an effect on RS choices and ECRs, but if we compare results across experiments, we can clearly see that both the proportion of RS choices and ECRs are substantially larger in experiment 1. To test whether there are significant differences in RS choices between experiments, we run three logit regressions clustering at the subject level with RS choices as a dependent variable. As independent variables we have 10 dummies for the games used, 4 dummies for the pie types, a dummy Player 1 that takes value 1 if the player has the higher payoff on RS, the period of play for experience effects and a dummy Experiment 1 that takes value 1 for experiment 1 and 0 otherwise. Model 1 includes all data, Model 2 includes all games except for C1 and C2, Model 3 only includes only games with no conflicts of interest (payoffs C1 and C2, with C1 as a baseline) and Model 4 includes only games A1-A4. Table 3 reports the marginal effect for all four estimated models. We can see that in all cases the estimated coefficient of Experiment 1 is strongly significant. The coefficient is lowest in model 3 and largest in model 4, providing evidence that the difference in RS choices between experiments is greater. Figures 3 and 4 report the predictive margins based on Model 3 and 4 estimations with 95% confidence intervals for both experiments by pie type. We can see that in games with no conflict, although in experiment 1 the probability of selecting RS is always greater than in experiment 2, there is a substantial overlap in the confidence intervals.

	(1)	(2)	(3)	(4)
VARIABLES		RS Choices		
Experiment 1	0.112***	0.123***	0.068***	0.140***
	(0.027)	*(0.029)*	*(0.0261)*	*(0.031)*
C2	-0.685***		-0.684***	
	(0.023)		*(0.0233)*	
A1	-0.129***			
	(0.017)			
A2	-0.191***	-0.062***		-0.062***
	(0.018)	*(0.014)*		*(0.014)*
A3	-0.186***	-0.057***		-0.057***
	(0.018)	*(0.014)*		*(0.014)*
A4	-0.214***	-0.085***		-0.085***
	(0.018)	*(0.014)*		*(0.014)*
B1	-0.114***	0.015		
	(0.022)	*(0.023)*		
B2	-0.214***	-0.086***		
	(0.023)	*(0.022)*		
B3	-0.382***	-0.253***		
	(0.022)	*(0.020)*		
B4	-0.107***	0.022		
	(0.018)	*(0.016)*		
Period	0.002***	0.002***	0.000	0.002***
	(0.000)	*(0.000)*	*(0.001)*	*(0.001)*
3-slice pie	0.039	0.026	0.092***	0.089**
	(0.029)	*(0.032)*	*(0.031)*	*(0.035)*
7-slice pie	0.063**	0.039	0.159***	0.119***
	(0.029)	*(0.032)*	*(0.030)*	*(0.036)*
11-slice pie	0.085***	0.065*	0.169***	0.145***
	(0.030)	*(0.033)*	*(0.031)*	*(0.037)*
Player 1		0.053***		0.079***
		(0.018)		*(0.023)*
Observations	12,320	9,856	2,464	4,928

Table 4: Regression Analysis for experiment effect

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

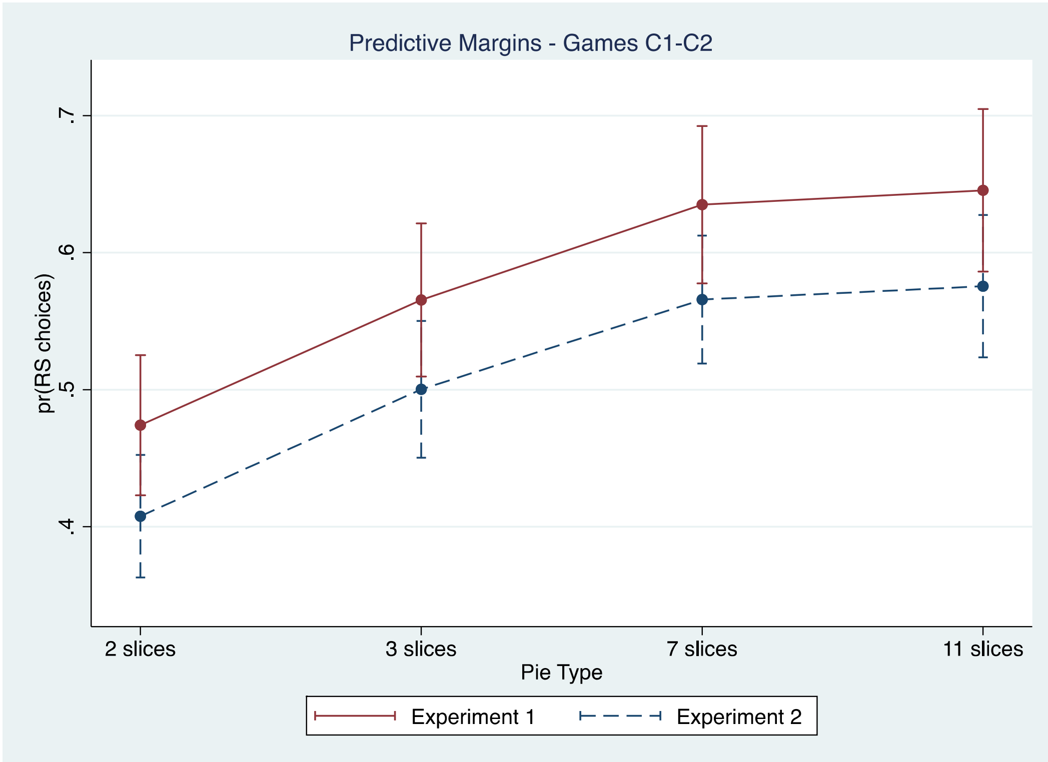


Figure 4: Predictive probability of RS choices by pie type and experiment for games with no conflicts of interest.

When we only consider games with a constant degree of conflict A1-A4 (Figure 4), we can see that the difference in probabilities between the two experiments is larger and almost always significant, with a small overlap in confidence intervals for the 11-slice pie. These results provide evidence that indeed payoff-irrelevant cues are more effective in experiment 1 than they are in experiment 2 for games with a constant degree of conflict.

Because we employ 40 games in both experiments, we can exclude that this effect is due experience. The only difference between experiments is the type of pie employed: in experiment 1 subjects face as many as four different pies while in experiment 2 they only face one. We have hypothesised that the strong saliency of RS in the 7 and 11-slice pie might have spilled-over pies with fewer slices. However, our results show that, although we observe a positive trend in RS choices as the number of slices increases (this can be seen in Figure 3 and 4) we also observe an upward shift in the predicted probabilities for all pie types in experiment 1 compared to experiment 2, being close a 10% significance level for the 11-slice pie, and this cannot be explained by spill-over effects only.

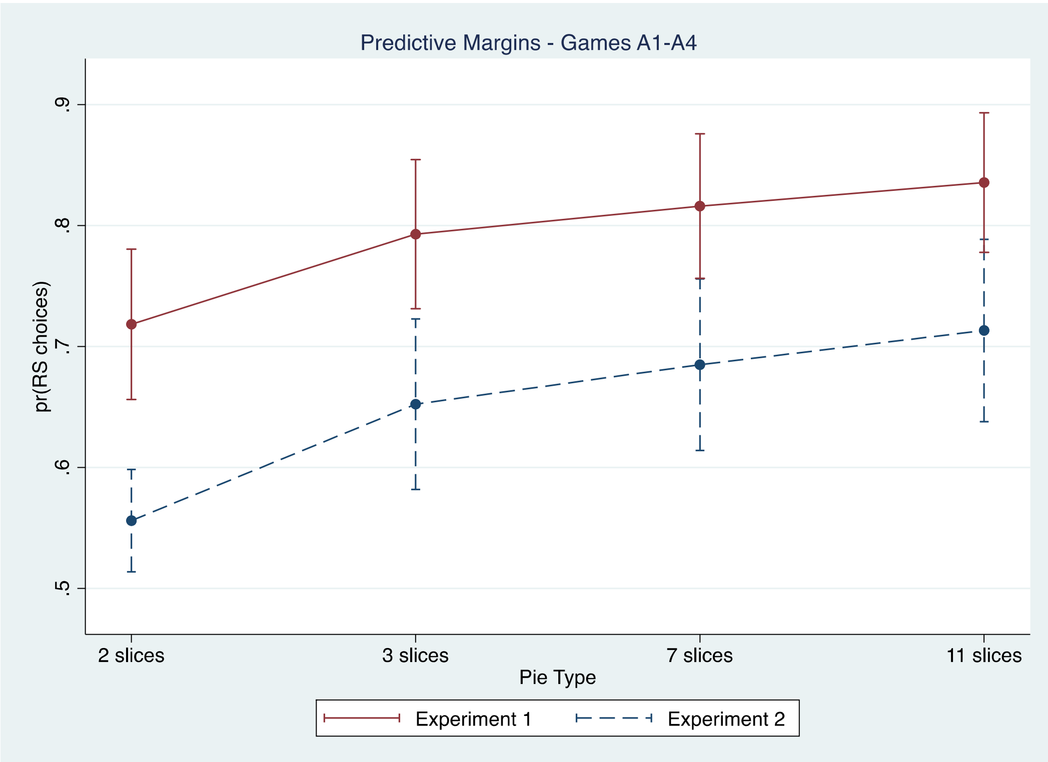


Figure 5: Predictive probability of RS choices by pie type and experiment for games with a constant degree of conflict

We conjecture that, when subjects face the same pie in many different games, as in experiment 2, their attention is drawn towards the elements that change, that is, the payoffs. So, subjects' attention is drawn to them and away from the payoff-irrelevant cues. The common features (the pie itself) are instead ignored in a way similar to the *isolation effect* reported by Kahneman and Tversky (1979). The isolation effect observed in choice under risk is the tendency to ignore components that are common to alternatives and to focus instead on those that make them different. So, while it is possible that the number of slices increases the saliency of the RS slice, the fact that the only elements that change across games are the payoffs, partially counteracts this effect. In experiment 1, on the other hand, also pie types change from task to task. This change catches subjects' attention reducing the relative saliency of the payoffs and increasing that of RS, that consequently is chosen more frequently.

So, while the source of saliency is different than what we predicted, our results provide strong support for the hypothesis that increasing the saliency of payoff-irrelevant cues makes the conflict of interest less salient and reduces the large coordination failures observed in previous experiments.

7. Conclusions

Back in 1960, Schelling showed that individuals are capable of successfully coordinate their expectations over payoff-irrelevant features and do better than what game theory predicts. Recent experimental evidence has however shown that Schelling's results were too optimistic. An ever so small conflict of interest between parties is capable of destroying the powerful coordinating effect of the focal points. We have advanced the conjecture that, when conflicts of interest are introduced, payoffs divert attention away from the payoff-irrelevant cues, leading to large coordination failures. By experimentally increasing the saliency of these cues, we are able to restore their effectiveness as coordination devices not only when the degree of conflict is small but also when it is large. Our results provide also evidence that subjects' attention is drawn to the features of the experiment that change from task to task. This finding raises the question of whether economic experiments over-emphasise the effect of incentives, as often, they are the only element that change when designs involve repetition of the same type of game. In the "real world", where many things change at the same time, it is possible that the impact that incentives on behaviour is diluted.

Reference List

Bardsley, N., J. Mehta, C. Starmer, and R. Sugden. 2010. "Explaining Focal Points: Cognitive Hierarchy Theory versus Team Reasoning." *The Economic Journal* 120 (543): 40–79.

Bock, O., I. Baetge, and A. Nicklisch. 2014. "Hroot: Hamburg Registration and Organization Online Tool." *European Economic Review* 71: 117–20.

Chowdhuri, S., D. Kovenock, D. Rojo Arjona, and N. Wilcox. 2016. "Focality and Asymmetry in Multi-battle contests." Economics Science Institute working paper 16-16.

Crawford, V. P, U. Gneezy, and Y. Rottenstreich. 2008. "The Power of Focal Points Is Limited: Even Minute Payoff Asymmetry May Yield Large Coordination Failures." *The American Economic Review* 98 (4): 1443–58.

Elliot, A. J., and M. A. Maier. 2014. "Color Psychology: Effects of Perceiving Color on Psychological Functioning in Humans." *Annual Review of Psychology* 65(1): 95–120.

Etchebehere, S., and E. Fedorovskaya. 2017. "On the Role of Color in Visual Saliency." *Electronic Imaging* 2017(14): 58–63.

Fischbacher, U. 2007. "Z-Tree: Zurich Toolbox for Ready-Made Economic Experiments." *Experimental Economics* 10 (2): 171–78.

Galeotti, F., M. Montero, and A. Poulsen. 2019. "Efficiency Versus Equality in Bargaining." *Journal of the European Economic Association* 17 (6): 1941-1970.

Hargreaves-Heap, S., D. Rojo Arjona, R. Sugden. 2014. "How Portable is Level-0 Behavior? A Test of Level-k Theory in Games with Non-neutral Frames." *Econometrica* 82(3): 1131-1151.

———. 2017. "Coordination When There are Restricted and Unrestricted Options." *Theory and Decision* 83 (1): 107-129.

Isoni, A., A. Poulsen, R. Sugden, and K. Tsutsui. 2013. "Focal points in tacit bargaining problems: Experimental evidence." *European Economic Review* 59: 167–88.

———. 2014. "Efficiency, Equality, and Labeling: An Experimental Investigation of Focal Points in Explicit Bargaining." *American Economic Review* 104 (10): 3256–87.

Isoni, A., R. Sugden, and J. Zheng. 2018. The Pizza Night Game: Efficiency, Conflict and Inequality in Tacit Bargaining Games with Focal Points. CBESS Working paper 18-01.

Jiang, H. Z. Yuan, M-M. Cheng, Y. Gong, N. Zheng, and J. Wang. 2013. "Salient Object Detection: A Discriminative Regional Feature Integration Approach." *International Journal of Computer Vision*: 2083–90.

Kahneman, D., and A. Tversky. 1979. "Prospect Theory: An Analysis of Decision Under Risk." *Econometrica* 47 (2): 263–92.

Kuhbandner, C., B. Spitzer, S. Lichtenfeld, and R. Pekrun. 2015. "Differential Binding of Colors to Objects in Memory: Red and Yellow Stick Better than Blue and Green." *Frontiers in Psychology* 6(MAR): 1–11.

Mehta, J., C. Starmer, and R. Sugden. 1994. "The Nature of Salience: An Experimental Investigation of Pure Coordination Games." *The American Economic Review* 84 (3): 658–73.

Parravano, M., and O. Poulsen. 2015. "Stake Size and the Power of Focal Points in Coordination Games: Experimental Evidence." *Games and Economic Behavior* 94: 191–99.

Rubinstein, A., and A. Tversky. 1993. "Naïve Strategies in Zero-sum Games." Working paper, pp. 17-93, Sackler Institute of Economic Studies, Tel-Aviv University.

Schelling, T. C. 1960. "The Strategy of Conflict." *Cambridge, Mass*.

Sitzia, S., and J. Zheng. 2019. "Group Behaviour in Tacit Coordination Games with Focal Points: An Experimental Investigation." *Games and Economic Behavior* 117: 461-478.

Sugden, R. 1995. "A Theory of Focal Points." *The Economic Journal* 105: 533–50.

van Elten, J., and S. Penczynski. 2020. "Coordination with Asymmetric Payoffs: An Experimental Study with Intra-group Communication." *Journal of Economic Behavior & Organization* 169: 158-188.

Appendix A

A.1. Within-subject experimental instructions

Experimental Instructions

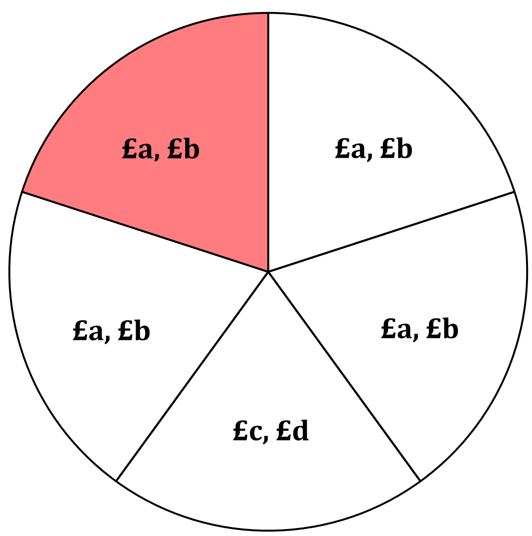
Welcome to this experiment in decision making.

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. Between-subject experimental instructions (2-slice as an example)

Experimental Instructions

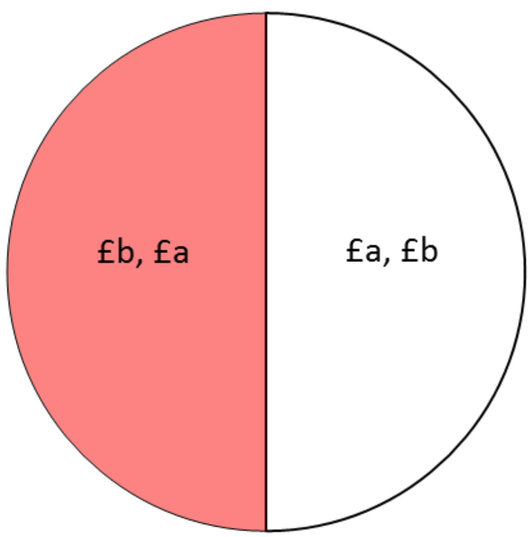
Welcome to this experiment in decision making.

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 these 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 <u>inspect carefully the amounts displayed in every slice</u> of the pie before making a choice.