The Pizza Night Game:
Conflict of Interest and Payoff Inequality in Tacit Bargaining Games with Focal Points

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Abstract

We report the results of a new tacit bargaining experiment that provides two key insights about the effects of payoff inequality on coordination and cooperation towards efficient outcomes. The experiment features the novel Pizza Night game, which can disentangle the effects of payoff inequality and conflict of interest. When coordination relies on *focal points* based on labelling properties, payoff inequality does not interfere with the successful use of those properties. When there are efficiency cues that assist coordination, payoff inequality is not an obstacle to the maximisation of efficiency. Conflict of interest is the main barrier to successful coordination. [99 words]

Keywords: Pizza Night game, tacit bargaining, conflict of interest, payoff inequality, focal points.

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1. Introduction

We present two major insights about the effects of payoff inequality on coordination and cooperation towards efficient outcomes. These are the highlights of an experiment investigating the relative roles of conflict of interest, efficiency, inequality and labelling in a wide variety of tacit coordination games framed as bargaining problems without communication.

Coordination problems are ubiquitous in economic and social life. In many cases, such as driving on the roads and setting prices in illegal cartels, solutions have to be found *tacitly*, without communication. Models of tacit coordination may also isolate significant features of real-world coordination or bargaining problems in which communication is possible but takes the form of cheap talk.[1] In this paper, we consider a simple class of models of tacit coordination. These are 2×2 *diagonal coordination games* in material payoffs. In such games, two players each choose one of two strategies, which can be arranged so as to produce a payoff matrix in which two pure-strategy Nash equilibria appear in the main diagonal with positive material payoffs to both players and all off-diagonal payoffs are zero. These games are ideal to study the equilibrium selection problem that is fundamental to coordination, because the only features of the payoff matrix that can affect players' strategy choices are the equilibria themselves. Given our interest in the effects of payoff inequality, we focus on material payoffs, which, unlike utility payoffs in classical game theory, can legitimately be compared between players.

Classical game theory struggles to deal with this equilibrium selection problem, because the analysis of best-response reasoning that identifies Nash equilibria cannot single out one of them as the unique solution to the coordination problem facing the players. This is most obvious in *Pure Coordination Games*, in which all the positive payoffs are identical, and the same for both players. But it is also true in *HiLo games*, in which one of the equilibria strictly Pareto dominates the other, or in *Battle of the Sexes* games, in which each player has a strict preference for a different equilibrium and the equilibrium payoffs are symmetrical.

When discussing games of this kind in *The Strategy of Conflict*, Schelling (1960) proposed that, recognising the challenge of equilibrium selection, 'rational' players will look for *cues* available to both of them that make one equilibrium *salient* (i.e., stand out), and so

[1] Schelling (1960: 267–272) offers a theoretical argument, based on backward induction, in support of this claim.

identify it as the *focal point* of the game. Useful cues can be found in the payoffs, as in HiLo games, in which one equilibrium is Pareto dominant (e.g., Harsanyi and Selten, 1988) – we will say that there is an *efficiency* cue. Alternatively, cues can be found in aspects of *labelling*. A label is a feature of a game, attached to a strategy or a player and known to one or both players, which is irrelevant for the players' payoffs. Our focus will be on 2×2 diagonal coordination games in material payoffs in which: (i) for each player, each strategy has a distinct label; (ii) the pair of labels, one of which may be salient, is the same for both players; and (iii) the Nash equilibria occur when both players choose the same label.

Labelling cues are key to coordination when no other cues are available. This has been studied extensively in the laboratory. Labelling cues dramatically increase coordination success in Pure Coordination games, independently of how these are framed (e.g., Schelling, 1960; Mehta et al., 1994; Bacharach and Bernasconi, 1997; Crawford et al., 2008; Bardsley et al., 2010; Isoni et al., 2013, 2019). However, when the same cues feature in Battle of the Sexes games, coordination success is typically less than in Pure Coordination games and, in some frames, is less than would result from random strategy choice (e.g., Crawford et al., 2008; Isoni et al., 2013, 2019; Sitzia and Zheng, 2019). Since many of the coordination and tacit bargaining problems that people face in real life bear more resemblance to Battle of the Sexes than Pure Coordination games, understanding the source of these coordination failures may have vital implications for the real-world relevance of Schelling's hypothesis. This is the main objective of this paper.

Relative to Pure Coordination games, Battle of the Sexes games have two key features which may be responsible for the less effective use of labelling cues: *conflict of interest* – i.e., the two players rank the two equilibria differently – and *payoff inequality* – i.e., conditional on coordinating, the two players receive different material payoffs. The importance of this distinction has so far been overlooked in the theoretical literature, possibly because classical game theory treats payoffs as utilities. However, if payoffs are material, as in virtually all experiments, they are comparable between players, and experimental participants may have attitudes which depend on such comparisons (e.g., Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000). Writers who have discussed the relative effectiveness of labelling cues in Battle of the Sexes and Pure Coordination games have described the distinguishing feature of Battle of the Sexes variously as conflict of interest, payoff inequality, or (more equivocally) 'payoff asymmetry'. As long as one confines attention to those two classic games, these descriptions are equivalent. Represented as 2×2 diagonal coordination games with payoff parameters $x, y > 0$, both games have on-diagonal payoff profiles (x, y) and (y, x); the only difference is whether x and y are equal or unequal. An inequality between x and y is both a conflict of interest (across equilibria) and a payoff inequality (within each equilibrium).

From a theoretical viewpoint, conflict of interest and payoff inequality both have the potential to disrupt the process of 'reasoning together' that Schelling envisages as the key to solve coordination problems (Sugden and Zamarrón, 2006). Conflict of interest may detract attention from the common goal of coordinating, if it leads players to construe the game as one in which, depending on who gets their way, there are winners and losers (Zizzo and Tan, 2011). Payoff inequality may decrease the likelihood that players think of themselves as a cohesive group, as assumed in some of the theories of *team reasoning* (e.g., Bacharach, 2006) developed to explain focal points.[2]

The relative strength of these two mechanisms is a matter of real economic significance. Conflict of interest and payoff inequality are potential obstacles to the realisation of mutual benefit. A salient outcome that benefits both parties may not be achieved because it requires one party to sacrifice their own personal interest, and/or because it requires them to accept a smaller share of the surplus than the other. If the presence of unavoidable payoff inequality were sufficient to prevent the realisation of mutual benefit, it would be bad news for market economies: many profitable transactions would not take place. But if 'stoicism' about unavoidable inequalities in reward (Bruni and Sugden, 2013) prevailed, inefficiencies would be confined to cases in which there are obvious conflicts of interest between the parties.

To analyse the separate effects of conflict of interest and payoff inequality, we devise a new game – the *Pizza Night game* – which is intermediate between Pure Coordination and Battle of the Sexes. Like those two games, the new game is to be interpreted as a modelling device for isolating specific mechanisms which might operate alongside others in more complex real-world environments. Because Luce and Raiffa's (1975: 51) Battle of the Sexes story is so well known, we start from a variant of this story, retaining its 1950s setting (conveniently before the era of mobile phones) and what Luce and Raiffa called 'usual

[2] One of the prerequisites of team reasoning assumed by Bacharach is 'group identification', which is thought to be facilitated by factors such as being members of the same pre-existing social group, belonging to an ad-hoc category (Tajfel, 1970), exposure to the pronouns 'we', 'our' and so on (Perdue et al., 1990), having common interest, being subject to a common fate (Rabbie and Horwitz, 1969), shared experience (Prentice and Miller, 1992), face-to-face contact (Dawes, van de Kragt and Orbell, 1988), and interdependence (Sherif et al., 1961).

cultural stereotype[s]'. An Italian couple are meeting for a meal downtown in the evening. They cannot communicate, and the choice is between a steak house and a pizza place. The husband prefers steak to pizza, the wife pizza to steak, but both prefer a meal together to a meal on their own. Pizza is label-salient, because the couple are Italian. Suppose also that husband and wife know each other so well that they both know that she enjoys pizza as much as he enjoys steak, and he enjoys pizza as much she enjoys steak. Thus, their payoffs become interpersonally comparable, like material payoffs in experimental Battle of the Sexes games. This game has conflict of interest – each spouse strictly prefers a different equilibrium – and payoff inequality – wherever they meet, one is better off than the other.

The Pizza Night game is obtained by removing conflict of interest from the Battle of the Sexes game.[3] Suppose the same couple has the convention to have pizza on a Saturday night. It is pizza night, and the two spouses have to meet, but cannot communicate. There are two pizzerias, where both spouses find pizza equally good. One is Italian, hence label-salient. It is common knowledge that she will enjoy food more in either place, so there is payoff inequality, like in Battle of the Sexes. However, neither spouse has a strict preference between restaurants, so, as in Pure Coordination, there is not conflict of interest. If coordination success in the Pizza Night game is as high as in Pure Coordination games, then the cause of coordination failure in Battle of the Sexes is conflict of interest. If it is as low as in Battle of the Sexes, the cause is payoff inequality. If it is intermediate, both factors are important.

Prior to knowing the results of the Pizza Night game, it is hard to predict the extent to which payoff inequality may hinder coordination. Evidence from games such as the Ultimatum and Dictator games may suggest that people may care about both advantageous and disadvantageous inequality. So, in the context of coordination games, if payoff inequality turns out to impede the successful use of payoff-irrelevant cues when these are the only cues available to players, it is possible that its disruptive effects extend to cases in which one equilibrium Pareto dominates the other. We investigate this question using variants of the prototype case of such situations – the HiLo game, in which one equilibrium ('Hi') assigns a higher material payoff to both players than the other ('Lo'). We ask whether introducing payoff inequality in either the 'Hi' or the 'Lo' equilibrium affects coordination success in such games when we keep the presence or absence of labelling cues constant.

[3] Note that it is not possible to have conflict of interest if inequality is removed.

The remainder of this paper is organised as follows. In Sections 2 and 3, we describe our experimental design and its implementation. We present our hypotheses in Section 4. Section 5 reports our main results. Our two key findings are briefly discussed in Section 6.

2. Experimental design

We study a number of 2×2 diagonal coordination games in material payoffs with and without labelling cues. Consider the games with labelling cues first. Their payoff matrix has the following general structure.

		Player 2	
		Strategy A*	Strategy B
Player 1	Strategy A*	a_1, a_2	0,0
	Strategy B	0,0	b_1, b_2

Each Player i = 1, 2 chooses between two strategies, A and B. In this representation, 'Player 1' and 'Player 2' are not to be interpreted as commonly known labels – in the experiment, the players will be called 'You' and 'Other', because we want to focus on strategy labels. A and B are placeholders for commonly known strategy labels. Strategy A's label is salient, as denoted by the '*'. Coordination occurs if both players choose A – in which case the equilibrium payoff pair is [a_1, a_2] – or if they both choose B, which results in equilibrium payoffs [b_1, b_2], a_i, $b_i > 0$.[4]

Note that this type of games is particularly well-suited to investigate questions about equilibrium selection, because the only useful information is contained in the coordination payoffs and the strategy labels. Other authors (e.g., López-Pérez et al., 2015) have looked at the comparative effects of principles such as efficiency and equality in games in which the off-diagonal payoffs were not zero and found mixed results. A possible explanation for such results

[4] There is also a mixed-strategy equilibrium in which Player 1 chooses A with probability $b_2/(a_2 + b_2)$ and Player 2 chooses A with probability $b_1/(a_1 + b_1)$. We do not consider playing the mixed-strategy equilibrium as successful coordination.

is that, with non-zero off-diagonal payoffs, other considerations, such as risk dominance, come into play.[5] With our design, we do not have to worry about such confounding effects.

For the analysis of our results, it is essential to consider how each of the two players views a particular game, and to refer to a *game* as the combination of two suitably matching views. We will denote Player i's *view* of the game as ‹$[a_i, a_j]$*, $[b_i, b_j]$›. The corresponding Player j's view will be ‹$[a_j, a_i]$*, $[b_j, b_i]$›. So, for the game above, Player 1's view is ‹$[a_1, a_2]$*, $[b_1, b_2]$› and Player 2's view is ‹$[a_2, a_1]$*, $[b_2, b_1]$›. In a player's view, the payoffs of the label-salient equilibrium (when there is one) are listed first and, within each payoff pair, the player's own payoff is shown first, followed by their co-player's payoff. So, a game view tells a player what the equilibrium payoffs are and if one of the equilibria is identified by a salient strategy label. A game has a payoff cue unless either $a_1 = b_1$ and $a_2 = b_2$ (i.e., the coordination payoffs of two equilibria are identical), or $a_1 = b_2$ and $a_2 = b_1$ (i.e., the coordination payoffs of the two equilibria are symmetrical). An example of a payoff cue is the efficiency cue found in HiLo games. In this setup, there are cases in which any distinction between the two players would be arbitrary, because the two relevant views are identical. The most obvious case is when $a_1 = a_2 = b_1 = b_2$, which corresponds to a Pure Coordination game. In such cases, the data from such views can be pooled in the analysis.

We study all the games that can be obtained by independently assigning one of two positive values – a *small* value S and a *large* value L, $0 < S < L$ – to each of a_i, a_j, b_i and b_j in the Players' views. There are sixteen possible views, C1 to C16, which can be matched to form a total of ten games with labelling cues, listed in the corresponding column of Table 1 that, for each game, reports the full payoff matrix, as well as the view notation for Player 1 (Row) and Player 2 (Col).[6]

(Insert Table 1 here)

The first three panels in Table 1 contain games with no payoff cues. When all payoffs are S, each player faces view C1. When they are all L, each faces C2. These cases constitute

[5] For instance, in López-Pérez et al.'s game 3, the efficient equilibrium is [110, 110], the inefficient [90, 90] (payoffs in experimental points). With off-diagonal payoffs equal to zero, this would be a HiLo game, in which we know from previous studies that most players would choose the strategies leading to the Pareto-dominant equilibrium. But in their game the off-diagonal payoffs were [0, 90] and [90, 0], making the strategy leading to the equal equilibrium also a *safe* strategy ensuring a payoff of 90 experimental points. López-Pérez et al. found that 16 percent of the games ended at [110, 110] and 35 percent ended at [90, 90].

[6] Using all combinations of S and L has the advantage of making transparent the mechanism by which our design is able to produce the games we need to investigate our hypotheses. This principle means, however, that there may be other games that, although informative, are not central to our research questions.

Pure Coordination games with labelling cues, PC* S and PC* L. Together, C3 and C4 constitute a Pizza Night game with a salient equilibrium (PN*). The player facing C3 is *favoured* in the sense that the inequality between *L* and *S* is in her favour in both equilibria. Similarly, the player facing C4 is *disfavoured*. The combination of C5 and C6 creates a Battle of the Sexes game with a salient equilibrium (BS*). The labelling cue favours the player facing C5.

All other games in Table 1 contain an efficiency cue, as one of the equilibria Pareto dominates the other. The two games in the fourth row are HiLo games. When both players face C7, the 'Hi' equilibrium is label-salient (Hi*Lo) – labelling and efficiency cues are *congruent* with each other because they select the same equilibrium. When both face C8, the 'Lo' equilibrium is label-salient (HiLo*), and the labelling cue is *incongruent* with the efficiency cue, because it points to a different equilibrium. The remaining four games, shown in the last two rows, modify Hi*Lo and HiLo* by making either the 'Lo' or the 'Hi' equilibrium unequal. This results in two *Lo-Unequal* games, in which the inefficient equilibrium is unequal (Hi*Lo≠, views C9 and C10, in which the efficient equilibrium is label-salient; and HiLo≠*, views C11 and C12, in which the inefficient equilibrium is label-salient); and two *Hi-Unequal* games, in which the efficient equilibrium is unequal (Hi≠*Lo, views C13 and C14, in which the efficient equilibrium is label-salient; and Hi≠Lo*, views C15 and C16, in which the inefficient equilibrium is label-salient).

The games on the right-hand side of Table 1 are obtained by removing the salient labels from the games just described.[7] In the corresponding views, the order of the two payoff pairs has no significance. This produces a total of seven games without labelling cues, because three pairs of games with salient labels (Hi*Lo and HiLo*; Hi*Lo≠ and HiLo≠*; and Hi≠*Lo and Hi≠Lo*) differ only in terms of which equilibrium is label-salient, and removing the salient label produces a single game without labelling cues.

3. Implementation

[7] Note that, in games without payoff cues, every strategy must have a distinct label (if not, players could not distinguish the two strategies and it would not be possible to determine the outcome of the game based on their undistinguishable choices). Whenever there are commonly known labels, it is not possible to completely eliminate all possible cues that players may find in them. To isolate the effects of labelling, we need to study games that differ with respect to the *comparative* salience of their labels. See Section 3.

Diagonal coordination games like the ones in our experiment have been studied in the literature using a variety of different frames. We adopt the *bargaining table* frame developed by Isoni et al. (2013, 2019), which reliably produces the lower coordination success in Battle of the Sexes than Pure Coordination and HiLo games that is the focus of our paper. Since Battle of the Sexes games can be seen as stylised models of tacit bargaining, using a design with bargaining-like features is compatible with our focus on the effects of conflict of interest. The bargaining table design does that with an intuitive visual representation. The design has also the advantage of providing a straightforward way of representing all the games shown in Table 1.

An example of the bargaining table version of the Pizza Night game is shown in Figure 1.

(Insert Figure 1 here)

The game is presented as a 9×9 grid of squares – the *bargaining table* – in which a player (‘You’) is assigned to the red *base* at the bottom, and faces an ‘Other’ player who sees the game from the grey base at the top. The ‘Other’ player in table (i) is the ‘You’ player in table (ii), and vice versa. Players can easily work out how the bargaining table looks from their co-player’s perspective.

The players’ objective is to tacitly agree on a division of the *discs* – the two round objects scattered on the table. Each disc has a value (in UK pounds) to each player, represented by the number shown on the half of the disc facing the player’s own base. So, in table (i), the ‘You’ player’s value of each of the two discs is £13 while the ‘Other’ player’s value of both discs is £8. All values, as well as the location of the discs on the table, are common knowledge between the players. Each player separately indicates which disc(s) they propose to take, *claiming* either none, one, or both discs, without knowledge of their co-player’s claims. Discs are claimed by clicking on them, and claims can be cancelled with a further click. Claims are visualised by colouring the claimed disc in red and connecting it to the red base with a red line, and can be freely changed until they are submitted.[8] There is an agreement on the division of the discs whenever no disc is claimed by both players. In that

[8] Some screenshots of the experiment can be found in the Appendix.

case, each player earns a payoff equal to the value *to them* of the disc(s) they claimed. If *any* disc is claimed by both players, there is no agreement and both players earn a payoff of zero.[9]

The four strategies available to each player can be abstractly described as: claim *none* of the discs, claim only the disc *close* to one's base, claim only the disc *far* from one's base, or claim *both* discs. Because claiming no discs ensures a payoff of zero, it is a weakly dominated strategy. Once this is eliminated, it makes no sense to claim both discs.[10] When each player claims exactly one disc, the game reduces to a 2×2 diagonal coordination game with two pure-strategy Nash equilibria, whose payoff matrix is identical to that of a Pizza Night game. Thus, tables (i) and (ii) in Figure 1 correspond to views C3 and C4 respectively, with S = 8 and L = 13. The commonly-known labels of the two strategies available to each player are *Close* and *Far* – i.e., it can be assumed that players describe the game to themselves as one in which they are choosing whether to claim the close disc or the far disc. The resulting game has a labelling cue if one of these labels is salient. In the bargaining table design, Close can be treated as label-salient, because in Pure Coordination games of this type players have an overwhelming tendency to choose the disc that is closer to their base (see Isoni et al., 2013, 2014, 2019).

Tables (iii) and (iv) produce an identical payoff matrix, except that now the strategies can be labelled *Left* (i.e., claim the disc more to the left as seen from one's base) and *Right* (i.e., claim the disc more to the right). Empirically, neither Left nor Right is salient (see Isoni et al., 2014, 2019). Tables (iii) and (iv) correspond to views N3 and N4 respectively, with S = 8 and L = 13, and so constitute a Pizza Night game without labelling cues. The only difference between the two Pizza Night games shown in Figure 1 is a matter of labelling. Thus, the bargaining table design introduces salient labels in the form of closeness cues. By implementing different games in this design, we can study the effect of payoff inequality on coordination success *for given labelling cues*.

By independently assigning the two values in an $\{S, L\}$ payoff pair to the two sides of each disc, we can produce bargaining table versions of all the games listed in Table 1. In the experiment, each participant faced an independently determined sequence of twenty-six 'scenarios', corresponding to views C1–C16 and N1–N10. All scenarios had just two discs,

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[9] The full text of the experimental instructions is reproduced in the Appendix.

[10] Allowing players to claim none or both discs enhances the bargaining feel of the game. Isoni et al. (2013) also show that it results in more effective use of salient labels. Weakly dominated claims are rare (see Isoni et al., 2013; 2019).

but differed with respect to the degree of inequality in the payoff pair (we counterbalanced the four pairs {10, 11}, {8, 13}, {6, 15}, and {4, 17}) and in the exact positions of the Close and Far (respectively, Left and Right) disc for each pair of matched game views.[11] Changing the difference between S and L allows us to investigate whether, if inequality matters, its size is also important. Based on previous work, we did not expect different disc layouts to have systematic effects,[12] but making each task more novel reduced the potential spill-overs between games, which is important given our interest in one-shot tacit games. For the same reason, there was no feedback between scenarios. This will allow us to treat each of them as a one-shot game.

The decisions in the experiment were incentivised. Participants were told that they had been matched with another anonymous person for the duration of the experiment. At the end of the experiment, one game was selected for each pair of participants, and they were paid on the basis of the claims they made in the selected game. In addition, they received a participation fee of £5.

4. Hypotheses

In this section, we state explicit hypotheses regarding conflict of interest and payoff inequality in our games. Given our design approach of producing an exhaustive set of games for given $\{L, S\}$ payoff pairs, there are other factors beyond our main research questions that can be investigated with our experiment. An obvious question is whether labelling cues have different effects in different types of games. We will briefly look at this issue by comparing games with and without those cues. Readers interested in other aspects (e.g., the effects of labelling cues for different payoff pairs) are referred to the Appendix.

All our hypotheses are about *coordination success* – the probability that, in a given game, randomly chosen pairs of players select strategies leading to an agreement on the division of the discs.[13] As stated in the Introduction, our primary interest is in disentangling the effects of conflict of interest and payoff inequality in games without payoff cues (Pure

[11] More details on these aspects of the design can be found in the Appendix.

[12] This expectation was confirmed. See details in the Appendix.

[13] Successful coordination typically occurs if each player claims exactly one disc and the two players claim different discs. But it may also occur whenever at least one of the players claims no disc (in which case it does not matter how many discs, if at all, are claimed by the other player).

Coordination, Pizza Night, and Battle of the Sexes). However, since payoff inequality may matter also in games with efficiency cues, we will also investigate whether it hinders coordination in such games (HiLo games and variants with payoff inequality).[14]

Our first three hypotheses are about games without payoff cues. We begin from the established finding that, for labelling cues of given salience, coordination success tends to be systematically lower in Battle of the Sexes games than in Pure Coordination games. Our first hypothesis is that our experiment replicates this pattern.

Hypothesis 1 – Validation. *In the presence of labelling cues, coordination success is greater in Pure Coordination games than in Battle of the Sexes games*.

As we have explained, our new Pizza Night game with labelling cues allows us to disentangle the effects of conflict of interest and payoff inequality. We can do this by comparing coordination success in this game with that in Battle of the Sexes and that in Pure Coordination games with the same labelling cues. The first comparison isolates the effect of conflict of interest, the second the effect of payoff inequality. These are our next two hypotheses.

Hypothesis 2 – Effect of conflict of interest. *In the presence of labelling cues, coordination success is greater in Pizza Night games than in Battle of the Sexes games.*

Hypothesis 3 – Effect of payoff inequality. *In the presence of labelling cues, coordination success is greater in Pure Coordination games than in Pizza Night games*.

If we find support for both hypotheses, it means that both factors have a disruptive effect on coordination. If we find support for Hypothesis 2 but not for Hypothesis 3, it means that the only disruptive factor is conflict of interest. If only Hypothesis 3 is supported, the only source of disruption is payoff inequality.

Our remaining hypotheses involve games in which there are efficiency cues. We investigate whether the possible disruptive effects of payoff inequality extend to such games. The neatest case of this kind is represented by a HiLo game without labelling cues. The presence of a Pareto dominant equilibrium is the only available cue, and is normally used effectively to achieve coordination (e.g., Bacharach, 2006; Bardsley et al., 2010; Isoni et al., 2019). If strategies leading to an unequal equilibrium are less likely to be chosen, making the

[14] Note that, in 2×2 diagonal coordination games, conflict of interest cannot arise when one of the equilibria (weakly) Pareto dominates the other.

‘Hi’ equilibrium unequal, but still weakly Pareto dominant (as in Hi-Unequal games), will obstruct coordination, while making the ‘Lo’ equilibrium unequal, but still weakly Pareto dominated (as in Lo-Unequal games), may increase coordination (if not already maximal), but will certainly not decrease it. If labelling cues have effects which are independent of payoff inequality, similar effects may arise in games in which those cues are present. On these bases, we can state our final two hypotheses.

Hypothesis 4 – Inequality of the efficient equilibrium. *Coordination success is greater in HiLo games than in Hi-Unequal games, both (a) in the absence and (b) in the presence of labelling cues.*

Hypothesis 5 – Inequality of the inefficient equilibrium. *Coordination success is at least as great in Lo-Unequal games as in HiLo games, both (a) in the absence and (b) in the presence of labelling cues.*

5. Experimental results

We recruited 200 participants from the general student population of the University of East Anglia (UK), using the hRoot online recruitment system (Bock et al., 2012) in the Autumn of 2016. Sessions took on average sixty minutes and resulted in an average payment of £13.46, including the £5 participation fee. The experiment was programmed in zTree (Fischbacher, 2007).

Before we turn to the tests of our central hypotheses in Section 5.4, we discuss some general aspects of our results. In Section 5.1, we look at the patterns of claims that participants made in the games with and without labelling cues. In Section 5.2, we report the patterns of non-dominated claims in all our games broken down by payoff pair. Finally, in Section 5.3 we test for the effects of labelling cues on coordination success by comparing games with and without those cues.

5.1 Aggregate claims

An aggregate summary of the claims made by the participants in our experiment is reported in Table 2a for the games with labelling cues and in Table 2b for the games without labelling cues. Tables 2a and 2b aggregate the data across different payoff pairs, and, consistently with this approach, also between Pure Coordination games in which all payoffs where *S* and those in which they were all *L*.

For each of the sixteen scenarios with labelling cues, Table 2a reports the frequency of each of the four available strategies (including the weakly dominated ones). Excluding the cases in which no disc or both discs were claimed, the columns headed ‘Single-disc Close claims’ and ‘Single-disc High-Value claims’ report the percentage of participants choosing the disc closer to their base or, respectively, the disc more valuable to them. The last column reports the median response time, in seconds, for the relevant scenario. Response times can be useful in the interpretation of our results, because in addition to reflecting the different complexity of different games, for games of comparable complexity they may highlight the cases in which the existence of forces pulling in different directions makes the decision more difficult for the participant.[15]

Table 2b reports the corresponding information for the games without labelling cues, but instead of the ‘Single-disc Close claims’ it reports the ‘Single-disc Left claims’ (recall that, in the games without labelling cues, the two discs were always in the middle row of the bargaining table, so one was more to the right as seen from the player’s base).

(Insert Tables 2a and 2b here)

The first aspect to notice is that weakly dominated claims were rare. The percentage of cases in which none of the discs was claimed is lower than 1 percent with or without labelling cues. Both discs were claimed on average in just 2.9 percent of the cases in games with labelling cues and 5.1 percent of the cases in games without labelling cues.

When there were labelling cues, the single-disc claim percentages reveal that the close disc was claimed by the majority of participants in Pure Coordination, Pizza Night, and Battle of the Sexes games. (Recall that, in these games, there are no payoff cues and the only way to select a (pure-strategy) equilibrium is by using labels.) However, the close disc was claimed much less often in Battle of the Sexes than in Pizza Night and Pure Coordination games. The other games with labelling cues also have an efficiency cue, as one equilibrium (weakly) Pareto dominates the other. This cue was extensively used. The percentage of single-disc claimants making choices consistent with selecting the efficient equilibrium

[15] In many tasks, response time tends to be longer when the available options are finely balanced for the participants, indicating that they find it more difficult to come to a decision (e.g., Tyebjee, 1979; Busemeyer and Townsend, 1993; Moffatt, 2005).

ranges from 80 to 91. Labelling cues disrupted this tendency slightly (compare C7 and C8, C10 and C12, C13 and C15), but making one equilibrium unequal did not interfere with the use of the efficiency cue (compare C7 with C9-C10 and C13-C14, and compare C8 with C11-C12 and C15-C16).

In games without labelling cues, there was a slight tendency for the right disc to be chosen more often than the left disc (overall, 46 percent of single-disc claims were on the left disc), especially in Pure Coordination games, Pizza Night games and Hi-Unequal games. When there was a disc that was worth more than the other, the vast majority of participants who claimed just one disc chose the more valuable one. The notable exception is the Battle of the Sexes game, in which the High-Value disc was claimed overall only by 48 percent of the single-disc claimants.

As noted earlier, the response time data reflect both how easy it was to process the information contained in the game display and how much deliberation took place after that information had been assimilated. It seems clear that, in the presence of labelling cues, the Pure Coordination game is the easiest to read (there is just one payoff value). Since the only asymmetry in this game is in the labelling, and since closeness is a highly salient cue, little deliberation seems to be required. It is therefore unsurprising that this game had the shortest response times. The Hi*Lo game provides another relevant benchmark. For a player who understands the structure of this game, the symmetry of the positions of the players, the absence of inequality and conflict of interest and the congruence of the efficiency and closeness cues makes 'close' a particularly obvious choice. However, the Hi*Lo game is not easy to read (the two discs are different from one another, and each has two payoff values). The fact that response times were longer in the Hi*Lo than in the Pure Coordination game ($p<0.01$) is probably due to information processing. In terms of ease of processing, Battle of the Sexes (non-identical discs, each with only one value) and Pizza Night games (identical discs, each with two values) seem intermediate between Pure Coordination and Hi*Lo games. It is noteworthy that response times in the Pizza Night game (in which players had to deal with inequality but not conflict of interest) were longer than in the Hi*Lo game ($p < 0.01$) but shorter than in the Battle of the Sexes game (in which players had to deal with both). The response times in games without labelling cues show similar patterns, with Pizza Night and Battle of the Sexes taking the longest.

Finally, we briefly discuss the possibility that, in spite of the absence of feedback between games and the independent randomisation of the order of the games for each participant, the sequence in which games were played had a significant impact on players' decisions. The most obvious effect of this kind is the possibility that, having faced a game with inequality in their favour (or disfavour), a player may have tried to 'average out' the value of their claims in the subsequent game. Such a behaviour might have been encouraged by our matching protocol, in which, although unknown, the matched participant was the same for the whole sequence of games. It must be noted that, given the counterbalancing and randomisation built into our design, any such order effect would not invalidate the tests of our main hypotheses. To investigate this possibility, we have looked at the most uncontroversial case: when a Pizza Night game (with or without labelling cues) was immediately followed by a Battle of the Sexes game (with or without labelling cues). In the Pizza Night game, the inequality is unequivocally in one's favour or disfavour, so any tendency to average out should manifest itself in a tendency to choose the more valuable disc more often when the Battle of the Sexes game followed a Pizza Night game with favourable inequality and less often when it followed a game with unfavourable inequality. We have identified ninety relevant cases but, controlling for the payoff inequality in each of the two games involved, we have found no systematic evidence of a tendency to balance inequality out.[16]

5.2 Claims by payoff pair

As we have seen, dominated claims were rare. In this sub-section, we look at the patterns of claims broken down by payoff pair, focusing on the cases in which exactly one disc was claimed. The relevant data are reported in Table 3a for the games with labelling cues and Table 3b for the games without labelling cues. Because of our interest in the patterns of claims contingent on the associated payoff values, in the Pure Coordination game we separate the cases in which all discs were valued *S* to both players from those in which all discs were valued *L*.

(Insert Tables 3a and 3b here)

In games with labelling cues, an interesting statistic is the percentage of single-disc claimants who claimed the close disc in games without payoff cues (PC*, PN* and BS*), and the percentage of participants who claimed the disc consistent with the efficient equilibrium

[16] The details of this analysis can be found in the Appendix.

in games with payoff cues (Hi*Lo, HiLo*, Hi*Lo≠, HiLo≠*, Hi≠*Lo and Hi≠Lo*). Note that, in cases in which there is both a disc worth more and a salient disc, the percentage reported allows for the identification of the one that is not provided. For example, the close disc in the BS corresponds to the more valuable disc in view C5 and to the less valuable disc in view C6. For games without labelling cues, we report percentage of Left claims for PC, PN and BS, in which there are no efficiency cues. Because in BS each player also has a disc worth more to her, we also report the percentage of 'Single-disc High-value claims'. For the HiLo game and its Unequal variants we report the claims consistent with the efficient equilibrium.

The patterns of single-disc claims are very clear. With the exception of the Battle of the Sexes game, varying the payoff pair has very little impact on the patterns of single-disc claims, irrespective of the presence of labelling cues. While this may not be surprising for the Pure Coordination and HiLo games, in which there is no inequality, it is an interesting finding that even relatively large inequalities have virtually no impact in the Unequal variants of the HiLo game. This is in line with the findings of Chmura et al. (2005), who study a number of variants of the HiLo game with an unequal and efficient equilibrium that strictly Pareto dominates an equal equilibrium and find that, irrespective of the degree of payoff inequality of the efficient equilibrium, around 70 percent of participants choose a strategy leading to the unequal but efficient equilibrium. The main difference is that, in our experiment, the corresponding strategy is chosen more often, on average 86 percent of the time, possibly because of the bargaining frame of our game (Chmura et al. presented their games as 2×2 matrices). More importantly for our main focus, the degree of inequality has no impact on the effectiveness of the closeness cues in the Pizza Night game. The single-disc claimants who are favoured by the inequality claim the close disc between 90 and 96 percent of the time (see view C3), those disfavoured by the inequality do so between 87 and 93 percent of the time (see view C4). If one considers that in the most extreme payoff pair ({4, 17}) one player earns more than four times than the other, our participants seem to have a very high tolerance of inequality.

Varying the payoff pair has systematic effects in Battle of the Sexes games, with and without labelling cues. In the games without labelling cues, it is clear that there is a tendency for the more valuable disc to be claimed less often when the payoff differences are small than when they are large (21 percent in the {10, 11} payoff pair versus 73 percent in the {4, 17} pair – see N5 in Table 3b). This effect – already documented by Crawford et al. (2008) and

Isoni et al. (2013, 2019) – is also visible in games with labelling cues (see views C5 and C6 in Table 3a).

5.3 The effects of labelling cues

By virtue of allowing for spatial cues of different strength, the bargaining table design is particularly well-suited to investigate the independent effects of labelling in different games. Following Isoni et al. (2013, 2014 and 2019), our design allows for such an investigation using a comparison of coordination success in games with and without those cues. Before turning to those effects, we describe how we measure coordination success with the data generated by our experiment, and how we use those measures to test hypotheses about coordination success.

Although in the experiment each participant was matched with an anonymous opponent, this matching was arbitrary in nature and never resulted in an actual interaction between the players. Computing coordination success exclusively on the basis of the arbitrary anonymous matches would make an inefficient use of the available data, because in each game each player was, effectively, playing against the population of co-players who saw the bargaining table in the position of the 'Other' player. Therefore, for the tests of our hypotheses, we will use a measure called *Mean Expected Coordination Success* (MECS) computed using the *legitimate matching procedure* already adopted by Isoni et al. (2013, 2019). For each game view, we match each participant, in turn, with all other participants who made decisions in a game view compatible with theirs with respect to the position of the discs and the disc values. (For example, for C3 in Figure 2, each player of C3 is matched with all players of C4 in a compatible layout except themselves.) For all these legitimate matches, we check whether the claims made by the two players overlap – resulting in coordination failure – or not – resulting in successful coordination. For each participant, this produces a measure of expected coordination success equal to the proportion of matches in which they coordinated successfully. For each game, MECS is the average across participants of these proportions for the relevant game views.

Summaries of MECS in all our games, with and without labelling cues, are presented in Table 4, pooling across different payoff pairs (a detailed decomposition can be found in the Appendix).

(Insert Table 4 here)

In order to make comparisons of MECS between pairs of games, we use a bootstrap method that takes into account the fact that MECS is obtained by repeatedly matching participants with each other (making the coordination success statistics for different participants not independent of each other). All our statistical tests are based on bootstrapping the distribution of the difference between the MECS of the two games being compared.[17] This involves repeatedly sampling participants, with replacement, to obtain 10,000 replications of the experiment (stratifying over disc layout and payoff pair), and computing a MECS difference for the relevant comparison for each replication. This allows us to extract a 95% confidence interval of the bootstrapped distribution of differences. We will say that there is a significant difference in coordination success between the two games being compared if this confidence interval does not contain zero.[18]

For each pair of games with and without labelling cues, Table 4 reports the actual difference between MECS in the game with cues and the corresponding game without, as well as the 95% confidence interval of the bootstrapped distribution of that difference. This allows us to see when introducing closeness cues has a significant effect on coordination success.

We can see that closeness cues are highly effective in games without payoff cues. In the Pure Coordination game, there is an average increase in MECS of 0.34, which is strongly significant (the confidence interval is very far from zero). The effect of closeness cues is also significant in the Pizza Night game – a MECS difference of 0.29 – and in the Battle of the Sexes game – a difference of 0.13. These data illustrate the typical finding that the same labelling cues tend to be used less effectively in the Battle of the Sexes game than in Pure Coordination games. They also point to a close similarity of their effects in the Pizza Night game compared to the Pure Coordination game.

In the other games, labelling cues do not result in a significant increase in coordination success when they are congruent with efficiency cues. This may be a ceiling effect due to the high baseline coordination success in the game without labelling cues (in a similar setting, Isoni et al., 2019, do find a significant increase in coordination success, but

[17] If we base our comparisons on the coordination success rates computed using the actual (but arbitrary) random matches in the relevant games, and compare them with standard non-parametric statistical tests that do not take the imperfect statistical independence of the observations into account, all our conclusions remain unaffected, except that the difference between coordination success in the Pure Coordination and Pizza Night game is significant only at the 10% level. See Appendix I for details.

[18] This approach is a variant of the test used by Isoni et al. (2019).

the baseline coordination success was lower). However, when labelling cues are incongruent with efficiency cues, there is a significant decrease in coordination success, ranging from –0.06 in the Lo-Unequal game to –0.12 in the HiLo game.

Overall, this analysis shows that our experiment produces the typical effects of closeness cues that have been found in previous applications of the bargaining table design. We can now turn to the tests of our main hypotheses.

5.4 Tests of the effects of conflict of interest and payoff inequality

We start from comparisons involving games without payoff cues, in which labelling cues provide the only cue for coordination. This will allow us to disentangle the effects of conflict of interest and payoff inequality. Our tests are based on bootstrapping the difference in MECS between the two relevant games using the method described in Section 5.3. Table 5 summarises the implications of our hypotheses, and reports the actual MECS differences and the bootstrapped 95% confidence interval.

(Insert Table 5 here)

Result 1 – Validation. *In the presence of labelling cues, coordination success is significantly higher in Pure Coordination than in Battle of the Sexes games.*

Support. MECS is 0.80 in PC*, and just 0.51 in BS*, a difference of 0.29, which is obviously statistically significant according to our bootstrap test (the 95% CI is [0.237, 0.348]). As we saw in Table 2, the close disc was claimed much more often in the Pure Coordination than in Battle of the Sexes game. Hypothesis 1 is strongly supported.

Result 2 – Effect of Conflict of Interest. *In the presence of labelling cues, coordination success is significantly higher in Pizza Night games than in Battle of the Sexes games.*

Support. MECS is 0.73 in PN*, and 0.51 in BS*, a difference of 0.22, which is statistically significant according to our bootstrap test (95% CI [0.162, 0.285]). Unlike in BS*, in which the close claims represent 63 percent of the single-disc, in PN* the close disc was claimed overall by 91 percent of single-disc claimants, suggesting that closeness is used much more effectively in that game. This provides strong support for Hypothesis 2: conflict of interest has a major disruptive effect on tacit coordination.

Result 3 – Effect of Payoff Inequality. *In the presence of labelling cues, coordination success is significantly higher in Pure Coordination games than in Pizza Night games*.

Support. MECS is 0.80 in PC*, and 0.73 in PN*, a difference of 0.07, which is just significant in our bootstrap test (95% CI [0.001, 0.141]). This provides support for Hypothesis 3, and indicates that payoff inequality does impede coordination. However, this effect is rather small. Single-disc close claims go down only slightly, from 94 percent in PC* to 91 percent overall in PN*. Because so many claim the close disc in PC*, there is little variation in individuals' coordination success for that game, and even small differences end up being significant. The longer response times in PN* indicate that participants have to think longer when coordination results in unequal material payoffs.

Having established that payoff inequality has some, albeit minor, disruptive effects on coordination success, we can now turn to the question of whether those effects also appear in the presence of efficiency cues with our tests of Hypotheses 4 and 5.

Result 4 – Inequality of the efficient equilibrium. *Coordination success is not significantly different between HiLo and Hi-Unequal games, both (a) in the absence and (b) in the presence of labelling cues.*

Support. MECS is 0.77 in HiLo, and 0.76 in Hi≠Lo, a difference of 0.01, which is not significant in our bootstrap test (95% CI [-0.055, 0.101]). This gives part (a) of the result. MECS is 0.78 in Hi*Lo, and 0.80 in Hi≠*Lo, a difference of -0.02 (95% CI [-0.094, 0.057]); it is 0.65 in HiLo*, and 0.66 in Hi≠Lo*, a difference of -0.01 (95% CI [-0.081, 0.083]). Neither difference is statistically significant, giving part (b) of the result. Regardless of which equilibrium is label-salient, making the efficient equilibrium unequal does not decrease coordination success.

Result 5 – Inequality of the inefficient equilibrium. *Coordination success is not significantly different between Lo-Unequal and HiLo games, both (a) in the absence and (b) in the presence of labelling cues.*

Support. MECS is 0.74 in HiLo≠, and 0.77 in HiLo, a difference of -0.03 (95% CI [-0.099, 0.056]), which is not significantly different in our bootstrap test, giving part (a) of the result. MECS is 0.80 in Hi*Lo≠, and 0.78 in Hi*Lo, a difference of 0.02 (95% CI [-0.063, 0.096]); it is 0.68 in HiLo≠*, and 0.65 in HiLo*, a difference of 0.03 (95% CI [-0.061, 0.102]). Neither difference is statistically significant, giving part (b) of the result. Regardless of which equilibrium is label-salient, making the inefficient equilibrium unequal does not increase coordination success.

6. Two key insights about the effects of payoff inequality on coordination

Many real-world interactions pose coordination problems that need to be resolved without communication. Schelling (1960) suggested that players can coordinate by relying on commonly known cues about payoffs or labels, even when the players' preferences are not perfectly aligned. The evidence supports Schelling's hypothesis, but in games with a Battle of the Sexes structure, successful coordination is much harder to achieve.

We have identified two possible causes of such coordination failures: conflict of interest – players prefer different equilibria – and payoff inequality – conditional on coordinating, one player's payoff is higher – and devised a new game – the Pizza Night game – to isolate the effect of payoff inequality. We have also explored the effect of payoff inequality in games in which one equilibrium Pareto dominates the other. Our experimental results provide a clear picture about the effects of inequality on the likelihood that tacit bargaining games result in an agreement yielding positive payoffs for both players. These provide two key insights.

The first insight is that, when salient labels provide the only cues to solve a coordination problem, payoff inequality does not provide much of an obstacle. In the Pizza Night game coordination success is consistently high, irrespective of the size of the resulting differences in material payoffs. On average, two randomly chosen players are expected to coordinate 73 percent of the time, only slightly less often than the 80 percent observed in Pure Coordination games. This reveals a willingness by players to accept even quite large payoff inequalities for the sake of coordination.

The second insight is that, in games with a bargaining frame like the ones we study, payoff inequality is not able, on its own, to inhibit tacit agreements that result in efficient outcomes, irrespective of whether these are supported or opposed by labelling cues. Finding that there are situations in which efficient outcomes are not disregarded if they come with sizeable inequalities in material payoffs is an important result from the point of view of economics. Most market transactions involve the creation of mutual benefit, but this may often result in distributions of surplus that systematically favour one of the parties. Our results indicate that the fact that a certain agreement results in an unequal outcome is not necessarily an obstacle to the maximisation of efficiency, even in cases in which only one of the parties stands to benefit.

Overall, our findings strongly suggest that the greatest challenge to tacit coordination is represented by overt conflicts of interest.

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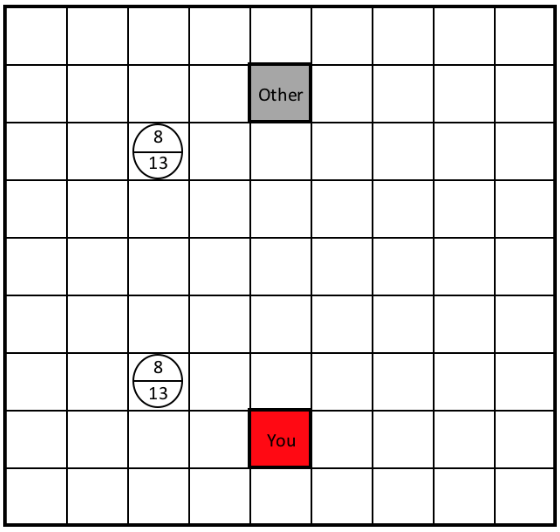
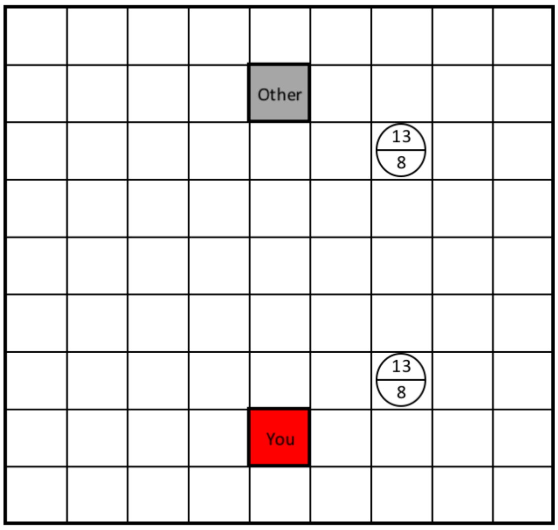
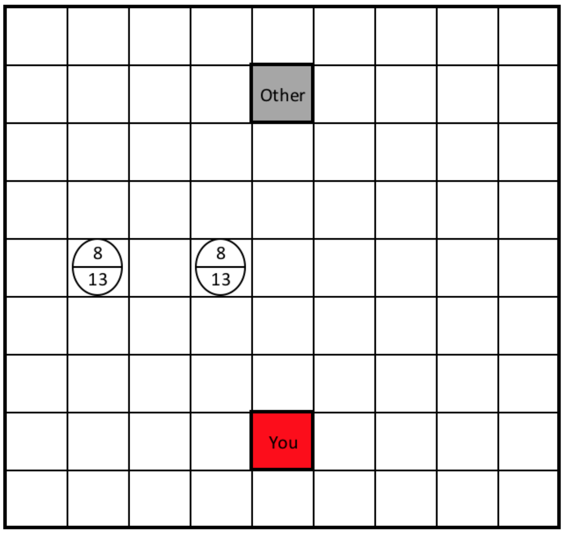


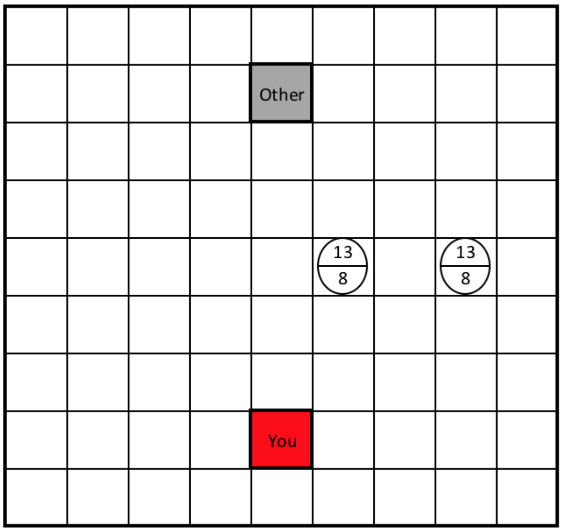
(i) C3 = ‹[L, S]*, [L, S]›



(ii) C4 = ‹[S, L]*, [S, L]›



(iii) N3 = ‹[L, S], [L, S]›



(iv) N4 = ‹[S, L], [S, L]›

Figure 1 – The Pizza Night game in the Bargaining Table frame

Table 1 – Games and views with and without labelling cues

Game	Games with labelling cues	Games without labelling cues

Pure Coordination

PC* S	A*	B
A*	S, S	0, 0
B	0, 0	S, S
Row:	C1 = ‹[S, S]*, [S, S]›	
Col:	C1 = {(S, S)*, (S, S)}	

PC S	A	B
A	S, S	0, 0
B	0, 0	S, S
Row:	N1 = ‹[S, S], [S, S]›	
Col:	N1 = ‹[S, S], [S, S]›	

PC* L	A*	B
A*	L, L	0, 0
B	0, 0	L, L
Row:	C2 = ‹[L, L]*, [L, L]›	
Col:	C2 = ‹[L, L]*, [L, L]›	

PC L	A	B
A	L, L	0, 0
B	0, 0	L, L
Row:	N2 = ‹[L, L], [L, L]›	
Col:	N2 = ‹[L, L], [L, L]›	

Pizza Night

PN*	A*	B
A*	L, S	0, 0
B	0, 0	L, S
Row:	C3 = ‹[L, S]*, [L, S]›	
Col:	C4 = ‹[S, L]*, [S, L]›	

PN	A	B
A	L, S	0, 0
B	0, 0	L, S
Row:	N3 = ‹[L, S], [L, S]›	
Col:	N4 = ‹[S, L], [S, L]›	

Battle of the Sexes

BS*	A*	B
A*	L, S	0, 0
B	0, 0	S, L
Row:	C5 = ‹[L, S]*, [S, L]›	
Col:	C6 = ‹[S, L]*, [L, S]›	

BS	A	B
A	L, S	0, 0
B	0, 0	S, L
Row:	N5 = ‹[L, S], [S, L]›	
Col:	N5 = ‹[L, S], [S, L]›	

HiLo

Hi*Lo	A*	B
A*	L, L	0, 0
B	0, 0	S, S
Row:	C7 = ‹[L, L]*, [S, S]›	
Col:	C7 = ‹[L, L]*, [S, S]›	

HiLo*	A*	B
A*	S, S	0, 0
B	0, 0	L, L
Row:	C8 = ‹[S, S]*, [L, L]›	
Col:	C8 = ‹[S, S]*, [L, L]›	

HiLo	A	B
A	L, L	0, 0
B	0, 0	S, S
Row:	N6 = ‹[L, L], [S, S]›	
Col:	N6 = ‹[L, L], [S, S]›	

Lo-Unequal

Hi*Lo≠	A*	B
A*	L, L	0, 0
B	0, 0	L, S
Row:	C9 = ‹[L, L]*, [L, S]›	
Col:	C10 = ‹[L, L]*, [S, L]›	

HiLo≠*	A*	B
A*	L, S	0, 0
B	0, 0	L, L
Row:	C11 = ‹[L, S]*, [L, L]›	
Col:	C12 = ‹[S, L]*, [L, L]›	

HiLo≠	A	B
A	L, L	0, 0
B	0, 0	L, S
Row:	N7 = ‹[L, L], [L, S]›	
Col:	N8 = ‹[L, L], [S, L]›	

Hi-Unequal

Hi≠*Lo	A*	B
A*	L, S	0, 0
B	0, 0	S, S
Row:	C13 = ‹[L, S]*, [S, S]›	
Col:	C14 = ‹[S, L]*, [S, S]›	

Hi≠Lo*	A*	B
A*	S, S	0, 0
B	0, 0	L, S
Row:	C15 = ‹[S, S]*, [L, S]›	
Col:	C16 = ‹[S, S]*, [S, L]›	

Hi≠Lo	A	B
A	L, S	0, 0
B	0, 0	S, S
Row:	N9 = ‹[L, S], [S, S]›	
Col:	N10 = ‹[S, L], [S, S]›	

Table 2a – Summary of claims in games with labelling cues

Game	View	Claim frequencies				Single-disc Close claims (%)	Single-disc High-Value claims (%)	Median response time (secs.)
		None	Close	Far	Both			
PC*	C1 = ‹[S, S]*, [S, S]› and C2 = ‹[L, L]*, [L, L]›	4	352	24	20	94	n/a	4.06
PN*	C3 = ‹[L, S]*, [L, S]›	1	170	13	16	93	n/a	6.52
	C4 = ‹[S, L]*, [S, L]›	2	167	22	9	88	n/a	6.29
BS*	C5 = ‹[L, S]*, [S, L]›	2	110	83	5	57	57	7.90
	C6 = ‹[S, L]*, [L, S]›	2	137	59	2	70	30	6.67
Hi*Lo	C7 = ‹[L, L]*, [S, S]›	0	175	21	4	89	89	5.34
HiLo*	C8 = ‹[S, S]*, [L, L]›	0	40	157	3	20	80	6.14
Hi*Lo≠	C9 = ‹[L, L]*, [L, S]›	0	176	20	4	90	n/a	6.62
	C10 = ‹[L, L]*, [S, L]›	0	178	18	4	91	91	6.03
HiLo≠*	C11 = ‹[L, S]*, [L, L]›	1	31	164	4	16	n/a	7.32
	C12 = ‹[S, L]*, [L, L]›	1	38	155	6	20	80	7.13
Hi≠*Lo	C13 = ‹[L, S]*, [S, S]›	0	178	19	3	90	90	4.77
	C14 = ‹[S, L]*, [S, S]›	2	176	18	4	91	n/a	5.31
Hi≠Lo*	C15 = ‹[S, S]*, [L, S]›	0	39	158	3	20	80	6.10
	C16 = ‹[S, S]*, [S, L]›	1	36	156	7	19	n/a	6.05

None = no disc claimed; Close = only close disc claimed; Far = only far disc claimed; Both = both discs claimed. Single-disc Close claims = percentage of close claims conditional on only one disc being claimed. Single-disc High-Value claims = percentage of claims on the more valuable disc conditional on only one disc being claimed. Response time = time elapsed between the moment the game was shown on the screen and the moment claims were submitted.

Table 2b – Summary of claims in games without labelling cues

Game	View	Claim Frequencies				Single-disc Left claims (%)	Single-disc High-Value claims (%)	Median response time
		None	Left	Right	Both			
PC	N1 = ‹[S, S], [S, S]› and N2 = ‹[L, L], [L, L]›	6	158	213	23	43	n/a	5.70
PN	N3 = ‹[L, S], [L, S]›	2	68	107	23	39	n/a	7.11
	N4 = ‹[S, L], [S, L]›	7	76	103	14	42	n/a	7.57
BS	N5 = ‹[L, S], [S, L]›	2	95	91	12	51	48	7.41
HiLo	N6 = ‹[L, L], [S, S]›	0	99	93	8	52	91	5.09
HiLo≠	N7 = ‹[L, L], [L, S]›	1	98	97	4	50	89	6.32
	N8 = ‹[L, L], [S, L]›	0	98	97	5	50	85	5.83
Hi≠Lo	N9 = ‹[L, S], [S, S]›	0	86	108	6	44	87	5.56
	N10 = ‹[S, L], [S, S]›	0	86	108	6	44	90	5.07

None = no disc claimed; Left = only left disc claimed; Right = only right disc claimed; Both = both discs claimed. Single-disc Left claims = percentage of left claims conditional on only one disc being claimed. Single-disc High-Value claims = percentage of claims on the more valuable disc conditional on only one disc being claimed. Response time = time elapsed between the moment the game was shown on the screen and the moment claims were submitted.

Table 3a – Claims by payoff pair in games with labelling cues

Game	View	Payoff pair {10, 11}	{8, 13}	{6, 15}	{4, 17}
		Single-disc Close claims (%)			
PC* S	C1 = ‹[S, S]*, [S, S]›	96	94	96	98
PC* L	C2 = ‹[L, L]*, [L, L]›	85	98	90	94
PN*	C3 = ‹[L, S]*, [L, S]›	96	91	94	90
	C4 = ‹[S, L]*, [S, L]›	87	90	84	93
BS*	C5 = ‹[L, S]*, [S, L]›	44	57	47	80
	C6 = ‹[S, L]*, [L, S]›	82	68	71	59
		Single-disc Efficient claims (%)			
Hi*Lo	C7 = ‹[L, L]*, [S, S]›	82	88	92	96
HiLo*	C8 = ‹[S, S]*, [L, L]›	80	76	83	80
Hi*Lo≠	C9 = ‹[L, L]*, [L, S]›	85	92	88	94
	C10 = ‹[L, L]*, [S, L]›	90	94	88	92
HiLo≠*	C11 = ‹[L, S]*, [L, L]›	76	86	92	84
	C12 = ‹[S, L]*, [L, L]›	77	77	85	82
Hi≠*Lo	C13 = ‹[L, S]*, [S, S]›	90	90	88	90
	C14 = ‹[S, L]*, [S, S]›	92	85	94	91
Hi≠Lo*	C15 = ‹[S, S]*, [L, S]›	71	90	77	82
	C16 = ‹[S, S]*, [S, L]›	74	85	85	81

Table 3b – Claims by payoff pair in games without labelling cues

Game	View	Payoff pair {10, 11}	{8, 13}	{6, 15}	{4, 17}
		Single-disc Left claims (%)			
PC S	N1 = ‹[S, S], [S, S]›	38	45	42	47
PC L	N2 = ‹[L, L], [L, L]›	47	27	45	49
PN	N3 = ‹[L, S], [L, S]›	35	44	37	39
	N4 = ‹[S, L], [S, L]›	37	47	36	50
BS	N5 = ‹[L, S], [S, L]›	49	49	57	49
		Single-disc High-value claims (%)			
BS	N5 = ‹[L, S], [S, L]›	21	49	49	73
		Single-disc Efficient claims (%)			
HiLo	N6 = ‹[L, L], [S, S]›	90	94	91	88
HiLo≠	N7 = ‹[L, L], [L, S]›	87	82	94	94
	N8 = ‹[L, L], [S, L]›	79	82	88	90
Hi≠Lo	N9 = ‹[L, S], [S, S]›	92	90	88	80
	N10 = ‹[S, L], [S, S]›	88	90	87	94

Table 4 – Summary of coordination success

No labelling cues		Labelling cues		MECS difference	
Game	**MECS**	**Game**	**MECS**	**Actual**	**95% CI**
PC	0.46	PC*	0.80	0.34	[0.279, 0.387]
PN	0.44	PN*	0.73	0.29	[0.233, 0.350]
BS	0.38	BS*	0.51	0.13	[0.070, 0.187]
HiLo	0.77	Hi*Lo	0.78	0.01	[-0.078, 0.094]
		HiLo*	0.65	-0.12	[-0.197, -0.024]
HiLo≠	0.74	Hi*Lo≠	0.80	0.06	[-0.021, 0.112]
		HiLo≠*	0.68	-0.06	[-0.136, -0.002]
Hi≠Lo	0.76	Hi≠*Lo	0.80	0.04	[-0.017, 0.117]
		Hi≠Lo*	0.66	-0.10	[-0.159, -0.020]

MECS = Mean Expected Coordination Success computed using the legitimate matching procedure. 95% CI obtained by bootstrapping the difference between coordination success in the game with labelling cues and the corresponding game without labelling cues.

Table 5 – Effects of conflict of interest and payoff inequality on coordination success

Hypothesis			MECS difference	
			Actual	95% CI
H1	Validation	MECS(PC*) > MECS(BS*)	0.29	[0.237, 0.348]
H2	Conflict of interest	MECS(PN*) > MECS(BS*)	0.22	[0.162, 0.285]
H3	Inequality	MECS(PC*) > MECS(PN*)	0.07	[0.001, 0.141]
H4 (a)	Inequality of efficient equilibrium	MECS(HiLo) < MECS(Hi≠Lo)	0.01	[-0.055, 0.101]
H4 (b)		MECS(Hi*Lo) < MECS(Hi≠*Lo)	-0.02	[-0.094, 0.057]
		MECS(HiLo*) < MECS(Hi≠Lo*)	-0.01	[-0.081, 0.083]
H5 (a)	Inequality of inefficient equilibrium	MECS(HiLo≠) > MECS(HiLo)	-0.03	[-0.099, 0.056]
H5 (b)		MECS(Hi*Lo≠) > MECS(Hi*Lo)	0.02	[-0.063, 0.096]
		MECS(HiLo≠*) > MECS(HiLo*)	0.03	[-0.061, 0.102]

Actual MECS difference between first and second game specified in hypothesis statement. 95% CI obtained by bootstrapping the difference between coordination success in the relevant games.