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'Two's Company, Three's a Group'
The impact of group identity and group size on in-group favouritism*

Donna Harris†, Benedikt Herrmann‡, and Andreas Kontoleon§

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Abstract

In this study, we use an allocation experiment to study the effects of group identity and group size on in-group favouritism when the person's own payoff is not affected by her decision. In a triadic setting when subjects are asked to allocate a fixed amount of resource between two other anonymous individuals, the majority of the subjects choose to allocate equal amounts to both the in-group and the out-group members. Telling the subjects that they belong to the same 'group' does not increase the amount allocated to the in-group member relative to the out-group member in a triadic setting. However, once the sizes of the in-group and the out-group are increased from one recipient to three (which we refer to as *'the favour game'*), we observe a sharp increase in in-group favouritism. Our results suggest that no special treatment is needed in a one-shot experiment to induce the distinction between the in-group and the out-group when groups consist of more than two group members.

JEL classification: D73, C92

Keywords: Favouritism, Group Identity, Group Behaviour, Group Size, Design of Laboratory Experiment

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1 Introduction

Following the seminal paper of Akerlof and Kranton (2000), the concept of group identity is now well-placed in the economic study of individual preferences and behaviour. Group identity or social identity is defined as a person's sense of self, which is shaped by her social environments and social categories such as gender, ethnicity, and occupation (Tajfel and Turner, 1979). When a person treats some individuals more favourably than others due to their group identity, that person is considered to be exhibiting 'favouritism' (Becker, 1957; Fershtman, Gneezy, and Verboven, 2005). An increasingly large number of experimental economics studies have shown that group identity, both naturally created and arbitrarily induced in the experimental lab, significantly triggers in-group favouritism. For example, in a trust game (Berg, Dickhaut, and McCabe, 1995) group identity has been shown to trigger in-group favouritism (Glaeser, Laibson, Scheinkman, and Soutter, 2000; Fershtman, Gneezy, and Verboven, 2005). When the 'truster' and the 'trustee' are from the same group, more is transfered and returned as compared to when they are from different groups. However, there seems to be heterogeneity in this behaviour across different countries. Buchan, Croson, and Dawes (2002) find that participants in the U.S. are more trusting and trustworthy to their in-group than to the out-group, whilst participants in China are more trusting and trustworthy towards the out-group. On the other hand, Hargreaves Heap and Zizzo (2009) find that group identity induced in a repeated trust game in the experimental lab in the UK reduces the transfer and return rates to the out-group member relative to the in-group member, but it does not increase the amount transferred to the in-group. Group identity has also been shown to affect cooperation in a Prisoner's Dilemma game. Using natural groups of the Swiss army platoons, Goette, Huffman, and Meier (2006) find that there is a higher willingness to cooperate with subjects who are from the same platoon.

A common feature of these experiments is that they apply experimental settings where social efficiency can be improved. However, very often favouritism takes place in an economic setting which may not create social efficiency. In the original study on in-group bias by Tajfel et al. (1971)[1] a zero-sum allocation game was used, although not with real monetary incentive. Recently, Chen and Li (2008) apply a similar zero-sum allocation game as used by Turner (1978) with real monetary incentive and use painting preferences to create group identity under three conditions: if both of them come from the in-group; if both come from the out-group, and if one comes from the in-group and the other comes from the out-group. The authors find the subjects allocate substantially more tokens to the in-group member than the out-group member.

However, in practice many economic decisions involve allocating resources between *groups*, and not just between individuals from different groups. For example, politicians in charge of a budget allocation have to decide how to allocate the budget between different interest groups rather than between individuals (Naegelen and Mougeot, 1998; Zantman, 2002). Referees in soccer games are usually accused of favouring one team over another (Rickman and Witt, 2008) rather than of just one or two players of a specific team. Therefore, the main objective of our study is to explore whether there is any difference in in-group favouritism behaviour when the decision-maker has to allocate resources between one in-group and one out-group members (a

[1] See Brewer (1979) and Tajfel and Turner (1986) for detailed summary of social psychology research on in-group favouritism and out-group discrimination using minimal group paradigm. For a critique of this literature, see Gaertner and Insko (2000), Yamagishi and Kiyonari (2000), and Yamagishi, Jin, and Kiyonari (1999).

triadic context) as compared to an allocation of a resource between two groups. To date, this question has not been investigated. Recent research has, nevertheless, indicated that interactions between groups are different from those between individuals when these concern an allocation of economic rents (Abbink, Brandts, Herrmann, Orzen, 2007). In addition, to our best knowledge, there is no universally agreed understanding in the experimental economics literature of the minimum number of members required to constitute a 'group'.

We posit that a group needs to consist of at least three members since in a bilateral relationship group members can pose a threat of future defection on each other in order to sustain cooperation (grim-trigger strategy). However, this mechanism cannot work when in a multilateral relationships (Boyd and Richerson, 1988) and thus, a different mechanism must be work. With this conjecture in mind, we design a new allocation experiment called '*the favour game*' where the decision-maker has to decide how to allocate a fixed amount of resource between three members of her own group and three members of the out-group in order to examine the extent to which a shift from bilateral to multilateral relationships changes individual behaviour. We operationally define in-group favouritism as 'a situation in which a person allocates a larger proportion of a fixed resource to each of her own group member(s) than to the out-group member(s)'. We focus on a situation where the resource to be allocated is fixed since this enables us to examine 'pure' group identity effect on in-group favouritism without possible confounds from concerns for efficiency.

Our design departs from the previous studies in five respects. Firstly, unlike previous work, group identity in our experiment is established without using preference selection criteria such as painting preferences (Chen and Li, 2008, Tajfel et al., 1971, Turner, 1978), colour schemes (Hargreaves Heap and Zizzo, 2009), or team building tasks (Eckel and Grossman, 2005). We test for the 'lowest' level of minimal group identity by simply telling subjects that they belong to either group A or group B. Secondly, we only allow the in-group members to make the decisions in order to avoid a situation where in-group members favour their group because they expect the out-group members to do the same or out-group fear (Ng, 1981). Thirdly, we apply a one-shot design to prevent possible confounds from 'reciprocal motives' (Gaertner and Insko, 2000; Yamagishi and Kiyonari, 2000) which may appear in a repeated game. Fourthly, we also incorporate an option which allocates nothing to either recipients (groups) (0,0) in order to check for anti-social preferences (Fehr, Hoff and Kshetramade, 2008; Herrmann et al. 2008). Finally in all of our treatments the decision-maker's own payoff is not affected by her allocation. Hence, her decision is only concerned with other players' payoffs and since all the options in the choice set are costless, this design enables us to measure the decision-maker's 'pure' in-group favouritism preferences. If the decision-maker only cares about her own payoff, she should be indifferent to all of the options. However, if one assumes that the decision-maker is inequity averse (Fehr and Schmidt, 1999) and empathic (Page and Nowak, 2002; Singer and Fehr, 2005) towards other subjects, she should choose to allocate the resource equally between groups since it is the only way in which the difference between the payoffs of the members of the two groups is minimised. We refer to this behaviour as '*generalised inequity aversion*'. On the other hand, in-group favouritism would be observed, if the decision-maker is not concerned about equitable outcomes amongst other individual and/or if she is more empathic towards the in-group members than to the out-group members.

We implement four different treatments. In the first triadic treatment (T1), there is no group identity. One decision-maker allocates a fixed amount of experimental money called 'Tokens' (which are converted into real money at the end of the experiment) between two randomly matched recipients. In the second triadic treatment (T2), two of the three subjects are told that they belong to the same 'group', whilst one other subject is assigned the role of a 'single player'. The decision-maker in this treatment is, therefore, asked to allocate the Tokens between one in-group member and one single player (an out-group)

The third treatment (T3) consists of 7 subjects who are randomly assigned to be Player 1 to Player 7. Of which, one is randomly selected to be the decision-maker who has to decide how to allocate the Tokens between each of the six other players. The main objective of this treatment is to test whether the size or number of recipients alone *without group identity* can trigger favouritism behaviour. Finally, in treatment 4 (T4) *both* group size and group identity are simultaneously introduced (*the favour game*). Similar to T3, there are 7 subjects, four subjects are told that they belong to 'Group A' and three other subjects are told that they belong 'Group B'. The initially asymmetrical group size allows us to maintain constant group sizes for both the in-group and the out-group when the decision is made. In other words, because the decision-maker is not allowed to allocate any Token to herself, she has to decide how to allocate the Tokens between each of the three *other* in-group members and each of the three out-group members.

We find that group size appears to be an extremely important determinant of in-group-favouritism. We hardly observe in-group favouritism in the first two treatments, but find significant in-group-favouritism in the third and particularly in the forth treatment.

The rest of the paper is organised as follows. The next section describes the experimental design and procedure in detail. Section 3 outlines the theoretical motivation and research hypotheses. Section 4 presents the main results, section 5 presents the results from the analysis of the socio-economic background and the behavioural data in order to check for internal validity, and the final section concludes.

2 Experimental Design and Procedures

The experiments were carried out between June 2008 and April 2009 in the UK and Thailand with a total number of 457 subjects. Two very different subject pools were used in order to test whether the treatment effects can be replicated. Most of the subjects in both subject pools were undergraduate students randomly selected from different faculties[2]. In the UK, the experiments were carried at the Universities of Nottingham and Cambridge with 237 subjects, whilst in Thailand, the experiments were conducted at Chulalongkorn University in Bangkok with 290 students. We were extremely careful with the experimental procedures in both countries. The protocols used in the Thai experiments were first translated from English to Thai and back-translated to English by the first author who is from Thailand and the Thai research assistants in order to ensure comparability of the procedures between the two subject pools.

After the subjects were all seated, each was given a written instruction. The decisions were then made in private separated by partitions. Each treatment lasted approximately 40 minutes and at the end of the experiment, the subjects were asked to complete a post-experimental

[2]Small proportions of the subjects were Masters and PhD students.

questionnaire, which consisted of questions regarding their socio-economic backgrounds, trust and political attitudes as well as attitudes towards group equality. The average payments across all treatments were 8 Pounds for the UK subject pool and 200 Baht (4 Pounds) for the Thai subject pool, which reflected the costs of living in both countries. Comparable exchange rates were implemented. In the UK, the exchange rate was 100 Tokens = 7 pence and it was 100 Tokens = 2 Baht in Thailand. Each subject in the UK received an on time show-up fee of 3 Pounds and each received 70 Baht (around 1.50 Pounds) for their show-up fee in Thailand. All of the treatments were administered by Z-Tree software (Fischbacher, 2007)

At the beginning of all treatments, each subject was given an initial endowment of 3,000 Tokens regardless of their roles. The subjects were clearly informed that they were not asked to allocate this initial endowment and that they were not allowed to allocate any Token to themselves. We carry out a 2x2 factorial design (group size and group identity) using the between subject approach, as shown in Table 1.

Table 1: 2x2 Factorial Design

Treatment	Triadic Setting (n=3)	Group Setting (n=7)
Stranger (no group identity)	T1	T3
Group Identity	T2	T4

Triadic Game with Strangers Treatment (T1)

In the first treatment, the subjects were randomly assigned the roles of Players 1, 2, and 3. Players 1 and 2 were asked to *individually*[3] make the allocation decision, which could affect the payoffs of the *other* two randomly matched players, whilst Player 3 did not make such a decision[4]. Players 1 and 2 were given an allocation choice set, which consisted of 8 options that allocated different amounts of Tokens between two other players. Figure 1 illustrates the choice set that was given to Player 1. Here, Player 1 had to decide how to allocate the Tokens between Players 2 and 3[5]. Options A, B, and C were specifically designed to represent *different magnitudes* of favouritism. Option D allocated equal amounts of Tokens to both players. Options E, F, and G allocated more Tokens to Player 3 than Player 2 in the reverse oder of options A, B, and C. This is to make the choice set symmetric and to allow for out-group favouritism behaviour to be observed in T2 and T4. Finally, option H allocated zero Tokens to both recipients, which allows for anti-social preference to be observed.

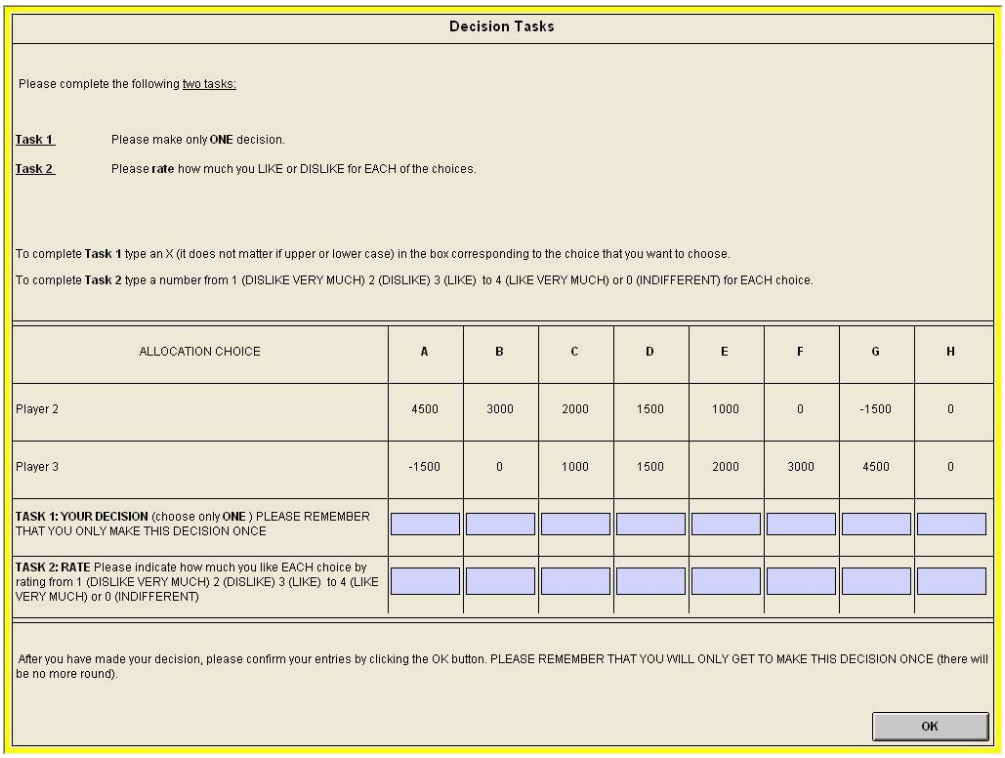
In addition to making the allocation decisions, Players 1 and 2 were also asked to 'rate' their preferences for each of the eight choices on a five-point scale: 1 (Dislike very much), 2 (Dislike), 3 (Like), 4 (Like very much), and 0 (Indifferent). The aim of the preference rating is to check the consistency between preferences and actual decisions. After Players 1 and 2 made their decisions

[3]In all treatments, the selected decision was only revealed at the end of the experiment. The personal identity of all players was kept anonymous.

[4]The reason for the asymmetry in allocation power is to keep the design consistent with the treatments with group identity - T2 and T4. It is necessary to give the allocation power only to one group in the group identity treatments to avoid a confounding effect from possible reciprocity motives.

[5]In the choice set for Player 2, she has to allocate the Tokens between Player 1 and Player 3.

Figure 1: An Example of the Choice Set for Triadic-Stranger Treatment (T1)



Decision Tasks

Please complete the following two tasks:

Task 1 Please make only **ONE** decision.

Task 2 Please **rate** how much you LIKE or DISLIKE for EACH of the choices.

To complete **Task 1** type an X (it does not matter if upper or lower case) in the box corresponding to the choice that you want to choose.

To complete **Task 2** type a number from 1 (DISLIKE VERY MUCH) 2 (DISLIKE) 3 (LIKE) to 4 (LIKE VERY MUCH) or 0 (INDIFFERENT) for EACH choice.

ALLOCATION CHOICE	A	B	C	D	E	F	G	H
Player 2	4500	3000	2000	1500	1000	0	-1500	0
Player 3	-1500	0	1000	1500	2000	3000	4500	0
TASK 1: YOUR DECISION (choose only **ONE**) PLEASE REMEMBER THAT YOU ONLY MAKE THIS DECISION ONCE								
TASK 2: RATE Please indicate how much you like EACH choice by rating from 1 (DISLIKE VERY MUCH) 2 (DISLIKE) 3 (LIKE) to 4 (LIKE VERY MUCH) or 0 (INDIFFERENT)								

After you have made your decision, please confirm your entries by clicking the OK button. PLEASE REMEMBER THAT YOU WILL ONLY GET TO MAKE THIS DECISION ONCE (there will be no more round).

OK

and completed the preference rating, a throw of a dice randomly selected one decision to be implemented[6]. The player whose decision was chosen (the DM) received a fixed payoff of 4,500 Tokens (π_{dm}) and was automatically assigned the role of the decision-maker. The payoffs of the other players were determined by the selected decision.

We elicited belief by asking Player 3 to identify the option which she thought the chosen player (the decision-maker) was most likely to choose. We also asked Player 3 to select an allocation option (from the same choice set) that she would have chosen if she was assigned the role of the decision-maker (hypothetical choice) since we wanted to examine the extent to which the subjects' beliefs influenced their decisions.

Triadic Game with Group Identity Treatment (T2)

The aim of this treatment was to test whether by telling the subjects that they belonged to the same group could trigger in-group favouritism in a triadic context i.e. testing *H2*. Two of the three subjects were randomly paired together and were told that they were members of the same group, whilst the other subject was assigned the role of a 'single player'[7]. Similar to T1, all players were given an initial endowment of 3,000 Tokens at the beginning of the experiment. Each of the group members was asked to individually make an allocation decision, whilst the single player was asked to indicate her belief and to make hypothetical choice similar to T1. The

[6]We use the following criteria: If the dice showed an odd number the decision of player 1 was selected and if it showed an even number the decision of player 2 was selected. The outcome was observable by all subjects.

[7]The subjects only knew their own group identity i.e. whether they were a member of a group or a single player. They did not know the personal identity of the subject whom they were matched with.

group members had to decide to allocate the Tokens between their fellow group member and the single player (from Figure 1, the top row became 'Your fellow group member' instead of 'Player 2' and the bottom row became 'The Single Player' instead of 'Player 3'). The remaining procedure is the same as T1[8].

Favour Game (group allocation) with Strangers (T3)

The aim of the group allocation game with strangers was to test the size effect (N and M) without group identity ($I_{in} = I_{out} = 0$) i.e. whether an increase in the number of recipients alone could already trigger favouritism behaviour. In this treatment, each subject was randomly matched with 6 other players and were randomly assigned to be Player 1 to Player 7. Players 1, 2, 3, and 4 were asked to make the allocation decisions. We only asked Players 1 to 4 to make the decisions in order to keep the design consistent with treatment 4 when group identity was introduced as will be explained below. From Figure 1, the top row of the choice set became '*each* of Players 1 to 4 (excluding you)' and the bottom row became '*each* of Players 5 to 7'. The selection process was similar to the triadic treatments[9].

Favour Game (group allocation) with Group Identity (T4)

The main purpose of this treatment was to examine whether *interaction* between group identity and group size could trigger a higher level and magnitude of favouritism behaviour. Similar to T3, each subject was randomly matched with 6 other players and each was endowed with 3,000 tokens. In order to create group identity, the same artificial group as in T2 was implemented. Four subjects were randomly grouped together and were told that they were members of 'Group A' (A1, A2, A3, and A4), whilst the other three subjects were told that they were members of 'Group B' (B1, B2, and B3). We refer to this game as the 'favour game'.

Only the members of Group A were asked to make the allocation decisions. We opted for asymmetrical group sizes (4 in group A and 3 in group B) in order to maintain a constant group size for both groups when the decision was made i.e. each member of Group A allocated the Tokens between each of the *other* 3 other members in Group A and *each* of the 3 members in Group B. Therefore, from the allocation choice set in Figure 1, the top row was replaced by 'Each Member of Your Group (Excluding you)' and the bottom row was replaced by 'Each Member of the Other Group'. Once all the members of group A made their decisions, one decision was randomly selected by the dice as in T3. The members of Group B were asked about their beliefs and hypothetical choices as in the other treatments.

[8] After the two group members made the decisions and rated their preferences, a throw of a dice randomly selected a decision to be implemented. If the dice showed an odd number the decision of group member 1 was selected and if it showed an even number the decision of group member 2 was selected. The group member whose decision was chosen received a fixed payoff of 4,500 Tokens and was assigned the role of the decision-maker.

[9] After all players made the decisions and rated their preferences, the decision was randomly selected by the dice. If the dice showed number 1, Player 1's decision was selected. If the dice showed number 2, Player 2's decision was selected and the same also applied for Players 3 and 4 (with numbers 3 and 4 of the dice). However, if the dice showed numbers 5 or 6, no decision was selected and the dice had to be thrown again until it showed the numbers between 1 and 4. The chosen subject received a fixed payoff of 4,500 Tokens and assumed the role of the decision-maker. Players 5 to 7 did not make any allocation decision, but were asked about their beliefs and hypothetical choices as in the triadic experiments.

3 Theoretical Motivation and Research Hypotheses

As mentioned above, our focus is on favouritism in allocation of a fixed resource and when the person's own payoff is not affected by her decision. We assume that the decision-maker (henceforth, the DM) maximises an interdependent utility function of the form: $U_{dm}(\pi_{dm}, \pi_{in}, \pi_{out})$. Where π_{dm} is the DM's own payoff. According to Fehr and Schmidt (1999), there are individuals who prefer egalitarian outcomes and these individuals dislike inequitable outcomes *more* when they are worse off (self-centred disadvantageous inequity aversion) than when they are better off. Since the decision-maker is not allowed to allocate anything to herself, we make the DM's payoff fixed and equal to the highest amount of Tokens which can be allocated from the choice set in order to minimise possible confounds from self-centred disadvantageous inequity aversion. The decision-maker's total payoff from the game is, therefore, 7,500 Tokens (3,000 Tokens initial endowment + 4,500 Tokens fixed payoff). The payoffs of the other in-group members (π_{in}) and the payoffs of the out-group members ($\pi_{out} = 1 - \pi_{in}$) are determined by the choice of the decision-maker.

The underlying motivation for our assumption of interdependent utility function is based on an assumption that the DM is empathic towards other individuals which means that she makes the allocation decision based on what she herself would be prepared to accepted if she was in the recipient's position (Page and Nowak, 2002). Consequently, the DM's utility function takes a linear functional form that is a weighted sum of her own (fixed) payoff, the in-group member's and the out-group member's payoffs:

$$U_{dm}(\pi_{in}, \pi_{out}) = \overline{\pi}_{dm} + w_{in}\pi_{in} + w_{out}(1 - \pi_{in}) \tag{1}$$

The weight of the DM's own payoff is normalized to 1 since the payoff is fixed and is equal to the highest possible amount that can be allocated to the other players. It is, thus, assumed to have no impact on the DM's decision. The weight assigned to the in-group's payoff is $w_{in} = [1 + \alpha(I_{in}) + \beta(N))]\rho$; and the weight assigned to the out-group's payoff is $w_{out} = [1 + \kappa(I_{out}) + \lambda(M)]\gamma$. Where $\rho \in [-1, 1]$ and $\gamma \in [-1, 1]$ are the baseline concerns (empathy) for the in-group's and the out-group's members respectively and can be positive, zero, or negative. In addition, we also assume that the level of empathy is influenced by group identity and group size. When group identities are switched on, $I_{in} = I_{out} = 1$, α and κ measure incremental effects of group identity on the level of empathy for the in-group's and the out-group's payoffs respectively. N and M represent 'pure' size effects (without group identity) and are set to 1 if the number of recipients alone has an impact on the DM's decision and are equal to zero otherwise. Therefore, β and λ measure incremental effects of the number of recipients on the level of empathy. If the DM only cares about her own payoff ($\rho = \gamma = 0$), equation (1) is reduced to $U_{dm} = \overline{\pi}_{dm}$. In this case, each allocation option is a sub-game perfect equilibrium as well as Pareto Optimal since it is not possible to make one person (or group) better off without making the other person (group) worse off. The DM maximises this utility function subject to the fixed amount of the resource which she is given to allocate.

Based on this framework, favouritism will *not* take place under three conditions: 1) when the DM has no baseline empathy towards others ($\rho = \gamma = 0$); 2) when the DM has the same

levels of empathy towards both the in-group and the out-group members and group identity and group size do not have any influence on the DM's decision. In this case, if the DM is generalised inequity averse, empathy will lead to equal split decision; and 3) when the DM is envious towards the in-group member ($\rho < 0$). In this case, if the DM is empathic towards the out-group, out-group favouritism may be observed. This conceptual framework gives rise to three main research hypotheses to be examined:

HYPOTHESIS 1 (Generalised inequity aversion): *In the absence of group identity, the subjects will exhibit generalised inequity aversion in their allocation decisions.*

Giving evidence of the existence of empathy (Singer and Fehr, 2005), we expect that subjects will make the decisions which they themselves would be prepared to accept and if they are also concerned about equitable outcomes amongst other individuals (generalised inequity aversion), they will chose the equal split option which minimise the difference in the payoffs of other individuals.

HYPOTHESIS 2 (Group identity effect): *Introducing group identity at the lowest level by telling the subjects that they belong to the same group is sufficient to trigger in-group favouritism*

If by telling the subjects that they belong to the same group in a triadic setting switches on the 'in-group identity effect' ($I_{in} = 1$), we should already observe an increase in favouritism and a decline in the generalised inequity aversion since the utility weight assigned to the in-group's payoff (w_{in}) is now increased.

HYPOTHESIS 3 (The group size effect): *Increasing the number of the in-group and the out-group members slightly will not trigger an increase in favouritism.*

If we observe that the very minimal group identity is enough to trigger in-group favouritism in a triadic setting (T2), increasing the number of the in-group and the out-group members slightly should not have a significant impact on the level and magnitude of in-group favouritism ($N = M = 0$). However, if the underlying preference of a member of a group which consists of three members is different from a group which consists of only two members, the size parameter for the in-group (N) may be switched on and thus, increases the weight associated with empathy towards the in-group members.

4 The Results

We first carried out the experiments in the UK and then Thailand in order to see whether the results could be replicated in a different subject pool. Within the UK, 113 male and 123 female subjects participated. The majority were undergraduate students with an average age of 21 years old. For the Thai subject pool, 148 male and 142 female subjects participated in our experiments, most of which were also undergraduate students from Bangkok with an average age of 21 years old. Summary statistics for each treatment are shown in Table 2.

Table 2: Summary Statistics: Thailand and UK Subject Pools

Variables	T1		T2		T3		T4	
	Thai	UK	Thai	UK	Thai	UK	Thai	UK
Total number of obs.	45	63	42	48	63	63	70	63
Male	53%	44%	43%	67%	67%	35%	29%	51%
Average Age	21	23	20	22	23	21	20	19
Undergraduate	78%	73%	95%	79%	49%	87%	87%	98%
Study Economics	87%	13%	50%	21%	76%	14%	41%	10%
Mean group equality attitude [std. dev.]*	3.22 [2.08]	5.15 [1.15]	3.07 [2.26]	4.57 [1.63]	3.44 [2.15]	4.75 [1.37]	3.63 [2.07]	4.38 [1.69]

Note: *Group equality attitude question asks whether the subjects agree with the statement 'We should do what we can to equalize conditions for different groups.' (1= Extremely Negative, 6= Extremely Positive, 0=Neutral).

4.1 The UK Subject Pool

RESULT 1: In the triadic game with strangers treatment (T1), the majority of the British subjects exhibited generalised inequity aversion towards two randomly matched recipients .

Within the UK subject pool, a total of 63 subjects participated in this treatment and 80% chose the equal split option. This suggested that the subjects were concerned about equitable outcomes amongst other individuals or generalised inequity aversion, even when their own payoff was not affected by their decisions($\rho = \gamma$). Only 17% of the subjects chose to allocate more Tokens to one player than another, whilst 2% exhibited anti-social preference by allocating nothing to the other two players. The decision-makers were also asked to rate their preferences for each of the options in the choice set and the result showed consistency between the subjects' preferences and their decisions.

We elicited beliefs by asking the subjects who were assigned the role of Player 3 to indicate the option which they *believed* that the decision-makers were most likely to choose. Sixty-two percent of Player 3 subjects believed that the decision-makers were most likely to choose the equal split option, whilst only 33% believed that favouritism would be observed. The actual observed behaviours did indeed support the belief data, although the proportion of fair outcome was even higher (80%) in the actual behaviours. When they were asked to make hypothetical decisions in the case that they were assigned to be the decision-makers, 90% chose the equal split option.

RESULT 2: When group identity was induced artificially by telling the subjects that they belonged to the same group, the effect of group identity on favouritism

was weak in a triadic setting (T2).

Forty-two subjects participated in this treatment in the UK subject pool. The overall proportion of in-group favouring options (options A, B and C) increased slightly from 12% to 28% as shown in Figure 2. However, the treatment effect was not statistically significant (Pearson's Chi2(7) = 6.17 (p = 0.52), Fisher's Exact test = 0.45, and (without option H): z = 1.40, $Prob > |z| = 0.16$). The results showed that even after group identity was induced, generalised inequity aversion still dominated the subjects' allocation decisions ($\rho = \gamma$). The proportion of the equal split option was 63% - slightly declined from slightly declined from 80% in T1 - but it still accounted for the majority of the decisions. This result suggested that the effect of generalised inequity aversion dominates that of group identity in the triadic setting when the subjects were told that they belonged to the same group. In terms of anti-social preference, only 3% chose option H and thus, it did not have a significant impact on our result. The preference rating results showed consistency between the subjects' preferences and their decisions.

The majority of the outsiders who were not assigned to be in a group (56%) expected that equal split option would be chosen, which coincided with the actual observed behaviour (63%). However, their expectation regarding favouritism did not match well with the observed behaviour of the decision-makers. Forty-four percent of the outsiders believed that favouritism would be observed and of which, 38% thought that the decision-makers would choose option A which was the highest magnitude of favouritism yielding the maximum payoff of 4,500 Tokens to the group member, whilst imposing a cost of 1,500 Tokens to the outsiders. Although this belief was not supported by the observed decisions, the fact that there was more expection of favouritism in this treatment suggested that once group identity was introduced even by telling people that they belonged in the same group, it could already trigger a shift in the expectation of favouritism as compared to T1 where group identity was obsence. Contrary to their expectations, however, when the outsiders were asked to make a hypothetical decision, 88% chose the equal split option.

Next, we examine hypothesis 3 in which we posited that increasing the number of the in-group and the out-group members slightly should not make a difference in allocation decision. Surprisingly, we found that once the size *and* group identity were induced simultaneously, markedly different results were observed.

RESULT 3: Once group size and group identity were introduced simultaneously, the effect of group identity on in-group favouritism was much stronger and the effect of generalised inequity aversion significantly declined (T2 vs. T4).

Sixty-three subjects participated in this treatment and the overall proportion of in-group favouritism rose dramatically from 28% in T2 to 81% in the favour game with group identity (T4) as shown in figure 2. The magnitude of favouritism also increased sharply. The largest increase was in the highest magnitude of favouritism i.e. option A [4,500: -1,500], which rose from a mere 9% to 42%. More importantly, the proportions of equal split option significantly declined from 63% to only 19%. Compared to T2, the treatment effect was statistically significant (Pearson's Chi2(5) = 21.10 ($p = 0.002$), Fisher's Exact test = 0.00, and Mann-Whitney (without option H): z = 4.07, $Prob > |z| = 0.00$). No subject chose option H and the preference rating

results showed a consistency between the subjects' preferences and their decisions.

In terms of the belief data, 85% of the out-group members believed that favouritism would be observed (compared T2 in which 44% of the 'lone' outsider or the single player believed that favouritism would be observed). In addition, only 11% of the out-group members believed that the DMs would choose the equal split option as compared to 56% in T2. These expectations also matched well with the actual observed behaviours in the experiments. Therefore, our results showed that the interaction between group identity and group size not only shifted the subjects' allocation decisions towards in-group favouritism, but it also significantly changed the expectations of both in-group favouring and generalised inequity aversion behaviour. When the out-group members were asked to make hypothetical decisions, only 33% now chose the equal split option, whilst 56% chose to favour their own group, which reflected their beliefs.

But because we introduced both group identity and group sizes at the same time, it was possible that this dramatic shift to in-group favouritism might be a result of larger group size and not group identity. We, therefore, checked whether in the absence of group identity, larger number of recipients alone could trigger in-group favouritism.

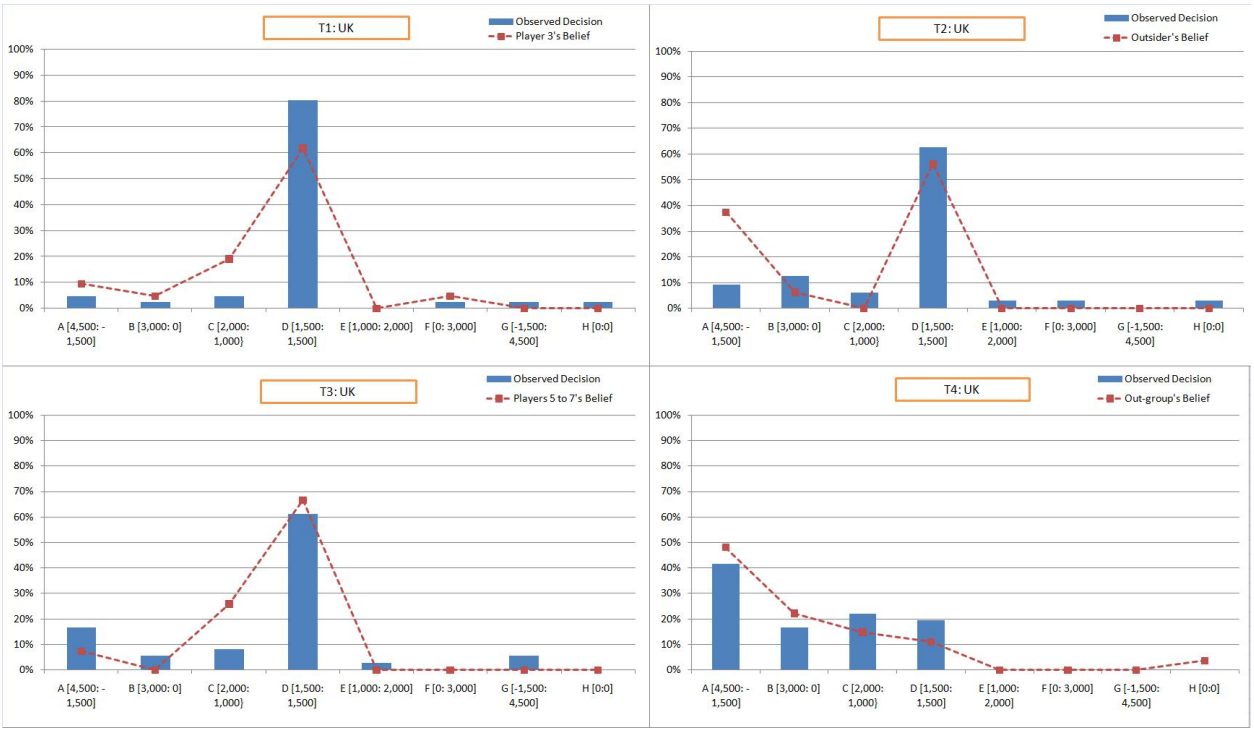
RESULT 4: Increasing the number of recipients alone (without group identity) did not trigger in-group favouritism in the UK subject pool (T3).

We carried out the favour game with strangers treatment in order to check whether the increase in in-group favouritism which we observed between T2 and T4 was mainly due to the 'size' effect. In this treatment, the subjects were not divided into groups. Instead, they were only assigned the roles of Players 1-7. Players 1 to 4 were asked to make the allocation decisions, whilst Players 5 to 7 were asked about their beliefs and hypothetical choice. Therefore, this treatment was similar to T1, except for the fact that instead of allocating between two other anonymous players, the subjects were asked to allocate between 6 other anonymous players. Sixty-three subjects participated in this treatment. Despite a slight increase in favouritism options from 12% to 31%, equal split option still dominated the subjects' allocation decisions (61%) and compared to T1 the treatment effect was not statistically significant (Pearson's Chi2(7) = 7.77 ($p = 0.35$), Fisher's Exact test = 0.34, Mann-Whitney (without option H): $z = 1.41$, $Prob > |z| = 0.16$). Therefore, the results showed that size alone could not trigger in-group favouritism behaviour among the UK subjects. Only one of the UK subjects in this treatment showed anti-social preference and similar to other treatments, the preference rating showed consistency between the subjects' prefereces and their decisions.

When we compared the results to those from T4 (favour game with group identity), there was a significant treatment effect (Pearson's Chi2(5) = 18.89 ($p = 0.00$), Fisher's Exact test = 0.00, and Mann-Whitney (without option H): $z = -3.91$, $Prob > |z| = 0.00$). This was due to a large increase in the proportion of favouritism options from 31% in this treatment to 81% in the favour game with group identity (T4) and a significant drop in equal split option from 61% to 19%. Hence, we can conclude that within the UK subject pool, *both* group identity and group size needed to be present in order for favouritism to be observed. The expectations of both favouritism and generalised inequity aversion remained also almost unchanged compared to T1 and matched well with the observed behaviour. When asked to make hypothetical decisions,

89% of Players 5 to 7 chose equal split option. This showed that an increase in the number of recipients alone did not alter the expectation of favouritism or generalised inequity aversion within the UK subject pool.

Figure 2: The DM's Behaviours vs. Out-group' Beliefs (T1-T4): UK



4.2 The Thai Subject Pool

RESULT 5: In the triadic game with strangers treatment (T1), generalised inequity aversion also dominated the subjects' allocation decisions.

Forty-five Thai subjects participated in this treatment and 40% chose an equal split option, which was half of the result from the UK subject pool. In terms of Player 3's beliefs, 60% of the Player 3 subjects in Thailand expected that the DMs would choose to favour one Player over the other, although we only observed 47% in the experiment. On the other hand, the expectation for equitable outcome coincideed with the observed decisions (40% for both belief and observed data). However, when they were asked to make a decision, 53% of Player 3 subjects chose equal split option, whilst only 40% chose to favour one player more than another. So, even though they believed that the majority of the decision-makers would choose to favour one player over another, when they had to make the (hypothetical) decisions they still chose the equitable option[10].

[10]Their answers could be affected by the order of the questions since the Player 3 subjects were asked about their beliefs *before* they were asked to make the decision. Therefore, they might try to give the 'right' answer that they thought the experimenter expected from them.

RESULT 6: The effect of group identity on favouritism was also weak in a triadic setting within the Thai subject pool (T2).

Forty-two subjects participated in this treatment in the Thai subject pool and the overall proportion of in-group favouring options (options A, B and C) increased slightly from 23% in T1 to 29% in this treatment. However, compared to T1, there was a significant treatment effect (Pearson's Chi2(6) = 10.7 ($p = 0.1$), Fisher's Exact test = 0.07, and and Mann-Whitney (without option H): $z = 1.70$, $Prob > |z| = 0.08$). A detailed analysis showed this significant treatmet effect was likely to be a result of the fact that the proportion of the equal split option *increased* from 40% to 68% once group identity was introduced as shown in Figure 3. This confirmed our UK results that generalised inequity aversion was the main factor which drove the subjects' allocation decisions in the triadic setting. None of the subjects in Thailand exhibited anti-social preference by choosing option H and the preference ratings also coincided with the subjects' decisions. In terms of the belief data, 57% of the 'lone' outsiders believed that of the decision-makers would choose to allocate more Tokens to their fellow group member, although in fact a much lower proportion (29%) was actually observed. Although despite the fact that more than half of the outsiders believed that favouritism would be observed, when they were asked to make a hypothetical decision, 79% chose the equal split option.

RESULT 7: Once group size and group identity were introduced simultaneously, the effect of group identity on in-group favouritism was much stronger and the effect of generalised inequity aversion declined (T2 vs. T4).

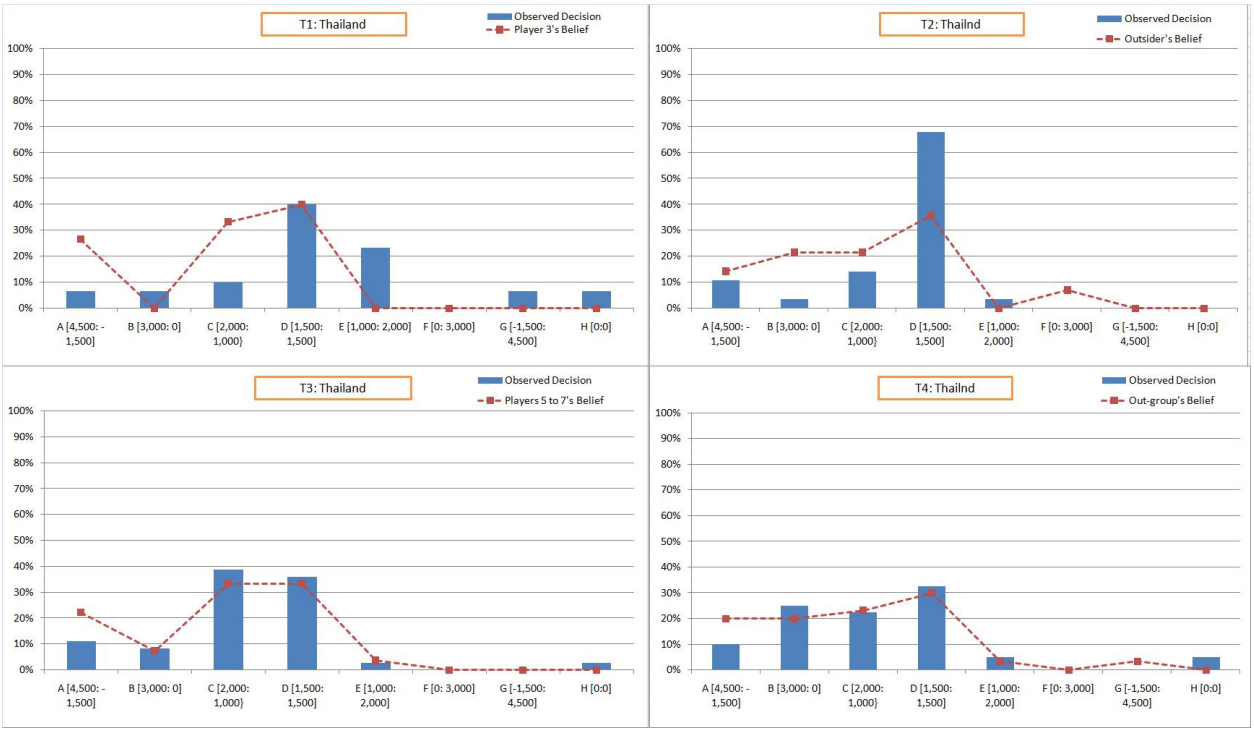
In Thailand, 70 subjects participated in this treatment and the overall proportion of in-group favouring options (options A, B, and C) rose from 29% in T2 to 58% in this treatment. The magnitude of favouritism also increased. Option C [2,000: 1,000] increased from 14% in T2 to 23%, whilst option B [3,000: 0], rose sharply from 4% in T2 to 25%, although there was almost no change in the highest magnitude of favouritism (option A). Compared to T2, the treatment effect was statistically significant (Pearson's Chi2(5) = 11.12 ($p = 0.05$), Fisher's Exact test = 0.03, and Mann-Whitney (without option H): $z = 2.15$, $Prob > |z| = 0.03$). The proportion of equal split option also declined sharply from 68% in T2 to 33% in this treatment. These results confirmed our findings of the UK subject pool. The out-group members's expectation for favouritism within the Thai subject pool increased slightly from 57% in T2 to 63% and only 30% now expected that the decision-makers would choose the equal split option.

RESULT 8: Increasing the number of recipients alone (without group identity) sufficed to trigger in-group favouritism within the Thai subject pool (T3).

Sixty-three Thai subjects participated in this treatment. Contrary to the UK results, once the number of the recipients were increased, the proportions of favouritism options (A, B, and C) rose from 23% in T1 to 58% in this treatment. The fact that over half of the subjects who were assigned the roles of Players 1 to 4 chose to allocate more Tokens to the other Players 1 to 4 than Players 5 to 7 implied that the size parameters were switched on ($N = M = 1$) even without

group identity. In addition, the proportion of equal split option only reduced slightly from 40% to 36%. Compared to T1, the treatment effect was significant due to the increase in in-group favouritism, although 39% of the increase was concentrated in option C which was the lowest magnitude of favouritism (Pearson's Chi2(6) = 14.43 ($p = 0.02$), Fisher's Exact test = 0.01, and Mann-Whitney (without option H): $z = 3.02$, $Prob > |z| = 0.00$). Only 3% of the Thai subjects exhibited anti-social preference[11]. Compared to T4 in which both group identity and group size were present, there was no significant treatment effect which also confirmed that within the Thai subject pool, it was *the size* which was the key determinant of favouritism behaviour. Compared to T1, the expectation of favouritism did not increase considerably (60% in T1, compared to 67% in this treatment) and the expectation of equitable outcome only declined slightly from 40% in T1 to 33%. However, when asked to make hypothetical decisions, only 19% of Players 5 to 7 chose to favour other Players 5 to 7, whilst 59% chose equal split option. Therefore, it seemed that even though increasing the number of recipients affected the observed decisions of Players 1 to 4, it did not have a significant impact on the expectation regarding favouritism of Players 5 to 7.

Figure 3: The DM's Behaviours vs. Out-group' Beliefs (T1-T4): Thailand



[11]The pattern of anti-social preference in all four treatments across both subject pools was rather random and only a very small proportion of the subjects exhibited this type of preference. Thus, this type of preference did not appear to have a significant influence on allocation decisions.

5 Favouritism and Inefficiency

So far, we have mainly focused on the income distribution effect of favouritism as the amount of total payoff was kept constant. Next, we further examine whether social inefficiency will influence the subjects' allocation decisions. Would the subjects favour their own group at a cost of the total payoff? Consequently, we carried out an additional treatment in order to examine whether *economic inefficiency* influences the subjects' allocation decisions. In order to test whether the proportion and magnitude of favouritism would be reduced once the subjects were informed that favouritism would lead to an inefficient outcome, we use the favour game with group identity with an alternative choice set. In the new choice set, in-group favouring options not only yielded inequality in income distribution, but also produced smaller total social payoffs for *both* groups (inefficiency). Whilst options D to H remain the same, option C reduces the total payoff by 500 Tokens by allocating 2,000 Tokens to each of the in-group member and 500 Tokens to each of the out-group members. Options B and A reduce the total payoff even further by 1,000 Tokens and 1,500 Tokens respectively.

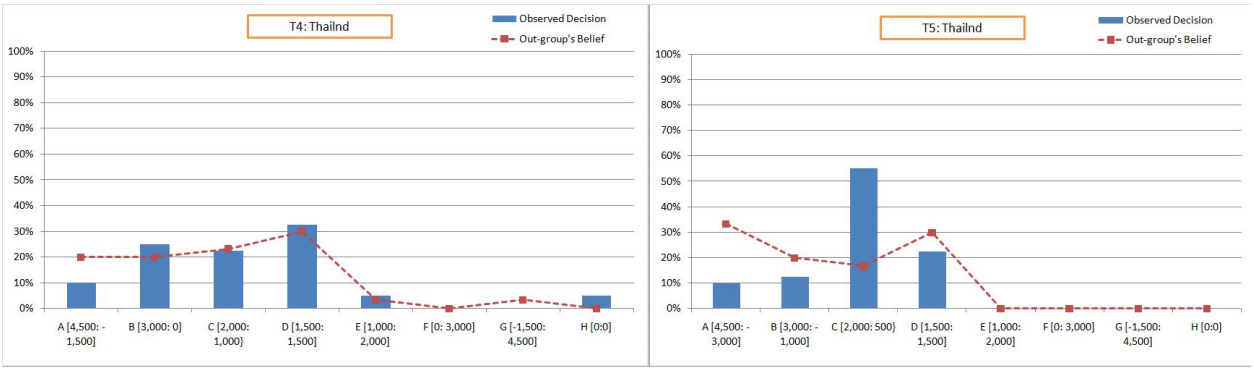
RESULT 9: Introducing social inefficiency did *not* affect favouritism behaviour.

We carried out this treatment in Thailand where 70 subjects participated. The result showed that the subjects did *not* deter from favouring their own group even though they knew that favouritism created inefficiency by reducing the total social payoff for both groups. In fact, the proportions of in-group favouritism options actually increased from 58% to 78% as compared to T4 (Favour game with Group Identity). The proportion of the highest magnitude of favouritism (option A) remained unchanged at 10 percent. In addition, the proportion of option C in the new choice set [2,000: 500] increased from 23% to 55%, whilst the proportion of equal split option reduced even further from 33% to 23%. Compared to T4, the Pearson's Chi-Square test and Fisher's Exact test showed significant treatment effect (Pearson's Chi2(5) = 11.85 ($p = 0.04$), Fisher's Exact test = 0.03), but not for the Mann-Whitney test (without option H) ($z = 0.36$, $Prob > |z| = 0.71$). Nonetheless, the result suggested that when group identity and group size effects were present, the majority of the Thai subjects preferred to favour their own group, even when their decisions created a loss in total payoff. Their preference ratings were also consistent with their decisions. In terms of the out-group's beliefs, 70% of the out-group members expected that favouritism behaviour would be observed, which was slightly higher than that in T4 (63%). The expectation was supported by the observed behaviours, although the expectation for option C was much lower (17%) than the actual observed behaviour (55%) as shown in Figure 4.

6 Socioeconomic Background and Favouritism

We also ran Ordered Probit regressions of the decision variable (dependent variable) against the socioeconomic data from the post-experimental questionnaire, namely age, gender, proportion of economic students in both subject pools, group equality attitude, country dummy (1= Thailand, 2= UK), and the level of acquaintance within each session in all of the treatments to test for internal consistency. For the triadic game with stranger treatment, none of the socioeco-

Figure 4: The DM's Behaviours vs. Out-group' Beliefs in Favour Game with Inefficiency (T5): Thailand



nomic and attitudinal variables were statistically significant. In the favour game with strangers treatment (T3), the proportion of economics students and the level of acquaintance within the experimental session had significant effects on the subjects' decision. The marginal effects showed that the probability of the equal split option being chosen increased with the proportion of economics students within the Thai subject pool. In addition, the higher the level of acquaintance within a session in both subject pools, the higher the probability that the subjects would choose favouritism options[12]. For the favour game with both group identity and group size (T4), proportion of economics students within the Thai subject pool, attitude towards group equality and the country dummy significantly influenced the subjects' decisions. The marginal effects of these variables showed that positive attitude towards group equality decreased the probability that option A would be chosen, whilst it increased the likelihood that the equal split option (as well as option C) would be chosen. The marginal effects for the country dummy showed that the UK subjects were more likely to choose favouritism options, particularly option A and B. Finally, the results from the favour game with inefficient outcome which we carried out in Thailand showed that the level of acquaintance significantly increased the probability that favouritism would be observed.

7 Concluding Remarks

This study examines the impact of group identity and group size on favouritism behaviour. Contrary to most previous studies which looked at cooperation, coordination, and trust behaviours, we focus on the allocation of a fixed resource or economic rent when the decision-maker's own payoff is not affected by her decision. The key feature of our experimental design is the allocation choice set which yields different distribution outcomes. The main reasons for using this choice set are firstly to examine the effect of favouritism on income distribution and secondly, to control for the allocation decision space across different treatments. Our main objective was to examine whether there was any difference in individual behaviour in a triadic setting as compared to a group setting - when a group consisted of three members - within a context of favouritism in

[12]We also checked the interaction effect between the country dummy and the level of acquaintance but the coefficient of this variable was not significantly different from zero.

resource allocation.

We found that in the triadic treatment without group identity, the subjects in both Thailand and the UK exhibited generalised inequity aversion towards other individuals, regardless of their cultural backgrounds. More importantly, we found that by telling the subjects that they belonged to the same group and when the decision-makers had to allocate the Tokens between one in-group and one out-group members, the effect of group identity was dominated by generalised inequity aversion or concerns for equitable outcomes amongst other individuals in both subject pools. Furthermore, in the triadic setting, there was a high expectation for the equitable outcome and this expectation was also consistent with the observed behaviors.

However, the situation changed dramatically, once the group size and group identity were induced simultaneously. Both the proportion and magnitude of favouritism increased sharply once the decision-makers had to choose between 3 in-group and 3 out-group members (rather one in each group as in the triadic setting). More importantly, the proportion of generalised inequity aversion also significantly declined. We also tested whether increasing the size alone without group identity would be enough to trigger favouritism and reduce generalised inequity aversion. The results showed that size effect was neither strong enough to outweigh generalised inequity aversion nor able to trigger significant increase in the proportion and magnitude of favouritism behaviour in UK. On the contrary, within the Thai subject pool, the larger number of recipients seemed to already trigger in-group favouring behaviour, albeit at a low magnitude. Finally, we examined the relationship between favouritism and economic inefficiency. We found that the subjects still chose to favour their group even if the total payoff was decreased by their decisions.

In summary, our main findings show that within the context of favouritism in resource allocation, the phrase "Two's Company, Three's Group" appears to apply. Although our current design does not touch on the exact reasons and mechanisms behind why a change in group size from two to three triggers such a considerable shift in the subjects' behaviour, it has certainly shown that group size, not just group identity, plays a crucial role in influencing the individual's preference and behaviour. In addition, given the simplicity and flexibility of our design, we believe that our favour game is a useful tool for further investigations of various aspects of in-group favouritism. For in stance, one could examine the exact reasons and mechanisms behind why in-group favouritism and other intra-group dynamics take effect only if a group has at least three member is warranted. The impact of the relative size of the in-group to the out-group's and the possible influence of even larger group sizes on in-group favouritism could also be explored. Finally, our design could also be used to formulate a demand function of favouritism by examining the willingness to pay for in-group favouritism of the decision-makers.

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