Re-imagining possibilities for minimal groups:

Extending the two-group paradigm

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MASTER'S THESIS

Declaration

Submitted in fulfillment of the requirements for the degree of Master of Social Science (Psychology), in the Discipline of Psychology, University of KwaZulu-Natal, Pietermaritzburg, South Africa.

I, ……., declare that

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Abstract

By stripping the social setting of many of its key features – including social interaction – the minimal group studies aimed to discover the basic conditions under which ingroup bias would occur. The studies found that group categorisation was sufficient for the development of ingroup favouritism and outgroup discrimination. This key finding led to the development of the social identity perspective – a theory of intergroup behaviour which is highly influential in social psychology. However, the minimal group studies were only conducted in a two-group setting, reflecting a general emphasis on dichotomous intergroup settings in social psychology. Furthermore, the removal of interaction from the social setting, in the pursuit of experimental control, reflects a view of human beings as passive conformers rather than active agents in the development of social norms. The aim of this research was to extend the minimal group paradigm in order to study a multigroup setting that reaches beyond the two-group group paradigm that has dominated traditional research. In particular, the inclusion of a third group illuminated the role of a middle status group which has been largely ignored. Second, by allowing social interaction, which is usually excluded due to lack of experimental control, the role of human agency and creativity in the formation of norms could be studied. It was found that it was within the middle status group that the strength of ingroup bias begins to weaken as group members strategically attempt to manage their position in the middle. Furthermore, particular behavioural trends accelerated or decelerated over time as they gained or lost momentum. While ingroup bias slowed over time for the middle status group, outward giving to the high status group increased. This finding exemplifies the two-way interaction between the social environment and the social actors within this environment. Finally, an unexpected outcome of this research was the divergence between the psychological experience and social reality in such a way that an intergroup alliance between the low and high status group (when a middle status group was included) was reported when in fact the exact opposite was true.

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Chapter 1: Introduction

In the pursuit of the goal of understanding intergroup behaviour in social psychology, the intergroup setting has been simplified, particularly in experimental research. The primary focus of this thesis is the dominance of the two-group paradigm in the study of group behaviour as well as the lack of interaction in social experimental research. I will argue how research should now be extended to consider multigroup settings which allow for interaction over time in order to expand our understanding of more complex intergroup dynamics.

The conceptualization of intergroup behaviour in terms of group bipolarity (two distinct groups) in experimental research has the following implications: 1) there may possibly be an inflated sense of 'natural' opposition and competition between groups (a sense of 'us versus them') (Hartstone & Augostinos, 1995); 2) middle status groups are common in real-life settings but have been largely neglected in research (literature is only available on class dynamics but even here the emphasis is not on the middle class (Lawson, 2012); and 3) intergroup alliances and solidarities between two or more groups (to the exclusion of others) is not open to study when only two-groups are considered. Therefore social psychological research should expand its focus from two-groups to a multigroup setting, which is the broad goal of this thesis.

One of the seminal social psychological experiments, the minimal group study (Tajfel, Billig, Bundy & Flament, 1971), employed the two-group paradigm and, through its vast influence in the field, has helped to sediment the notion of the ingroup versus the outgroup via the social identity perspective (Tajfel & Turner, 1979). This theory has become hugely influential in social psychology and the number of studies published in this area continues to grow (Billig, 2002). Not only is the social identity perspective a theory of prejudice and discrimination, Billig (2002) argues that it is a theory of group freedom because:

> It tells of the way that oppressed groups can find ways to challenge groups that have the power to ascribe identities and stereotypes. The most original parts of the theory describe how groups can re-create stereotypes that are applied to them: they can find new dimensions of comparison, alter the valuation of existing traits, collectively oppose powerful out-groups. (p. 179)

The social identity perspective has, to some extent, been expanded in order to consider multiple groups (for example: superordinate identity (Turner, 1985); the Politicised Collective Identity Model (Simon & Klandermans, 2001); the Political Solidarity Model (Subašić, Reynolds & Turner, 2008)). However these extensions to the body of theory have not arisen from directly studying multigroup dynamics. The social identity perspective needs to more closely consider multigroup settings in order to explain social phenomena such as intergroup alliance and solidarity between two groups to an exclusion of a third; as well as the role of a middle status group in intergroup relations. These phenomena have not previously been studied using the minimal group paradigm.

Therefore the minimal group studies are used as the methodological springboard to introduce a third group to the traditional two-group setting in order to directly study various intergroup dynamics as they emerge over time. A novel experimental method – the Virtual Interaction

Application (VIAPPL) – was used in the present study. This method allowed participants to interact over time in a controlled laboratory setting – a new development in social psychological research. Furthermore, a third group could easily be introduced with this method by testing three different social hierarchies. This allowed for the comparison of intergroup behaviour among groups of different status – namely: high, middle and low status groups. Of particular interest, this research aimed to study how ingroup bias operates in a three-group setting; the potential behavioural similarities and/or differences of the middle status group in relation to the high and low status group; and the most basic conditions for intergroup alliances and solidarities to arise.

Besides a focus on the two-group paradigm, social psychological research has also not placed enough emphasis on the role of interaction in the evolution of social behaviour. Reicher and Haslam (2013) argue that this has resulted in a conformity bias in social psychology where participants (and therefore people) are seen as passive conformers to external social norms and pressures. However, they argue that in fact, humans are actively involved in the development of these very norms and therefore the interaction between norms and people is a two-way evolving and emergent process.

The minimal group studies were also guilty of the exclusion of interaction, possibly resulting in a more individual rather than social theory of intergroup behaviour (Bornewasser & Bober, 1987) as well as ignoring the emergent nature of social norms in a particular context. In fact, although Tajfel began the studies hypothesizing the importance of norms – he argued that ingroup bias was a generic social norm – he later abandoned this theory for the social identity perspective which argues that discrimination against an outgroup can be traced back to the psychological need of people to distinguish their groups as superior in order to achieve a positive social identity and high self-esteem (Tajfel & Turner, 1979; Condor, 2003).

It is possible that by excluding interaction over time, the role of norms was downplayed and Tajfel's original interest in them, justified. By considering interaction in the development of norms, it is possible that the social identity perspective may benefit from extensions related to the evolution of social norms in context-bound settings.

The present study addressed both of these, by using a computerized and networked experimental platform – the Virtual Interaction Application (VIAPPL) – to allow a study in an extended minimal group paradigm to be staged. This method allowed for the extension of the minimal group studies through: 1) including a third group in the traditional two-group paradigm; 2) manipulating status to achieve a middle status group; and 3) allowing for intergroup and interpersonal interaction to occur over time in order to consider the emergent nature of social norms.

In the next section I will review the minimal group studies and their critiques and trace their contribution to the social identity perspective. This will show that the minimal group studies should be extended to consider multigroup settings and the role of interaction over time.

Chapter 2: Literature Review

The central argument of this thesis is that social psychological research in the past has been somewhat limited due to the almost exclusive focus on the two-group paradigm; as well as for not adequately accounting for the role of interaction in the evolution of intergroup behaviour. This chapter will explore the potential reasons that these aspects have been missing (or at least underemphasized) in traditional research and what possible effects this has had on the field of social psychology. A motivation will be provided for why expanding the two-group paradigm and allowing for interaction in experiments could be beneficial to the extension of traditional research approaches. As the present study is an extension of the minimal group studies (Tajfel et al., 1971), the original studies and their influence (particularly in the development of the social identity perspective (Tajfel & Turner, 1979) will be discussed in some detail.

The dominance of the two-group paradigm in social psychology

Traditionally, research on intergroup behaviour has mainly been focused on two-group settings. Only relatively recently have scholars in the field of social psychology started to more critically question the sometimes explicit, though more often implicit, bipolar two-group paradigm that is dominant in the study of intergroup relationships (see for example: Kerr, Durrheim & Dixon, unpublished manuscript; Subašić et al., 2008; Simon & Klandermans, 2001; Hartstone & Augostinos, 1995). These recent critiques show that it has been standard practice for intergroup behaviour to be studied in terms of two separate and dichotomous groups, for example: the ingroup versus the outgroup, low status versus high status, advantaged versus disadvantaged, majority versus minority.

In Allport's (1954) seminal book, 'The Nature of Prejudice', he opens his first chapter by giving examples of intergroup rivalries and prejudiced interactions mostly in dichotomous terms – whites and blacks; English and American; Polish and Ukrainian. He argues that "Every line, fence, or boundary marks off an inside from an outside. Therefore in strict logic, an ingroup always implies the existence of some corresponding outgroup" (p. 41) Here, and elsewhere, he seems to implicitly focus primarily on group dichotomy. Here, 'outgroup' is referred to in the singular, implying only two groups – the ingroup and the outgroup. This implicit group dichotomy has slipped into common conceptions and understandings of intergroup interactions although it is quite apparent that more complex interactions in multigroup settings exist and are common in everyday life. For example, Allport refers to relationships between nationalities dichotomously (for example, Polish and Ukrainian) however, international relations are often more complex and involve third parties. A modern day example would be the role of third parties (such as the United States) in the Israeli-Palestinian conflict.

Allport did hint at more complex intergroup interactions, for example in his description of intergroup relations in apartheid South Africa: "The English…are against the Afrikaaner; both are against the Jews; all three are opposed to the Indians; while all four conspire against the native black" (p. 3). So although early work in social psychology had some awareness of these complex multigroup settings, dichotomous two- relationships became the focus of direct study.

Early theory and research sediments the notion of group dichotomy

The two-group paradigm has been particularly dominant in experimental social psychology, and can be traced back to seminal studies in the field. This is best illustrated by two highly cited and influential studies: the Robber's cave/realistic conflict studies (Sherif, 1966; Sherif et al., 1961) and the minimal group studies (Tajfel et al., 1971). First, a brief description and critique of the two-group paradigm in the Robber's cave experiments will be presented. Then, as the present research is based on extending the minimal group paradigm methodologically, a more detailed description and critique of the minimal group studies will be discussed.

The Robber's cave/realistic conflict studies

The aim of Sherif and colleagues' experiments (1961) was to study intergroup competition and co-operation in a relatively realistic group context. The study was conducted in a summer camp setting where young boy participants were divided into two groups – the Rattlers and the Eagles – and pitted against one another to provoke intergroup hostility. From the start of the experiments, the choice of two groups highlights the taken for granted nature of the two-group paradigm.

The participants in the study were supposedly unaware of the manipulations by the experimenters in creating intergroup competition, fueled by contrived events such as tugs of war, athletics events *et cetera*. In this way, the development of discriminatory and prejudiced interactions between the two groups could be studied in a semi-realistic setting that allowed for intergroup interaction. The researchers concluded that structural relations – and competition for scarce resources – could explain group conflict (Sherif et al., 1961).

The findings from these studies led to what became known as the "realistic group conflict theory" (R.C.T) where "a real conflict of group interests causes intergroup conflict" (Campbell, 1965, p. 287 as cited in Tajfel & Turner, 1979). This theory, as Tajfel and Turner (1979) argue "is deceptively simple, intuitively convincing and has received strong empirical support" (p. 33). Realistic conflict was argued to not only result in intergroup competition and discrimination but also lead to intragroup morale and cohesiveness resulting in higher identification with the ingroup (see Vinacke, 1964; Fieldler, 1967; Kalin & Marlow, 1968, as cited in Tajfel & Turner, 1979).

The realistic conflict studies have become highly influential in the field of social psychology. In fact, Cherry (1995) points out that they are often referred to as "memorable and ground-breaking piece(s) of research" (p.102). They have been viewed as 'classic' social psychological studies which Cherry (1995) has traced through over seventy textbooks in social psychology starting from the 1950s. The reason that these studies have become so prominent is that they were the first to show how experimentation could be "woven into everyday life" (Cherry, 1995, p.102), reducing the suspicion of participants in order to reduce social desirability effects. In addition, the development of realistic conflict theory was extrapolated from the context of boys in a summer camp to universal laws of social behaviour which could be applied to understand intergroup relations in organizations, between racial groups and the international context (Cherry, 1995). However, there are two main critiques related to these studies. First, they helped

to sediment the two-group paradigm even though there was a powerful third group involved (Billig, 1976; Cherry, 1995) and second, although they allowed for interaction to occur, Sherif and colleagues ignored one whole study where participants (through interaction) resisted the manipulations of the experiment and did not conform to the experimenters expectations (Reicher & Halsam, 2013). These critiques will be explored in greater detail below.

The powerful third group

Billig (1976) and Cherry (1995) have criticised the Robbers Cave studies for not considering the role of the third powerful group in the equation – the experimenters. The experimenters imposed social relations on the participants who were unaware that they were part of a study. These manipulations included: "first the division into groups, then the imposition of competitive relations, followed finally by cooperative relations" (Reicher & Haslam, 2013, p. 120). Competitive relations were created through events such as tugs of war and athletics competitions, already mentioned above; while experimenters tried to create cooperative relations by encouraging meals together; allowing boys to watch a movie together and going as far as to fake car troubles in order for the two groups to work as a team (Sherif et al., 1961).

Billig (1976, as cited in Cherry, 1995) argued that experimenters created a 'false consciousness' in the two groups, where each group thought the other was the cause of their problems when, in fact, the real source behind the conflict was the 'group' of experimenters. Therefore Billig wondered how intergroup interaction would have occurred differently if the groups of boys had discovered this invisible third group. He points out that this could not be empirically investigated retrospectively as there were no available data. However, Cherry (1995) did find a brief reference to the discovery of this powerful third group in one of the earlier studies in 1953. This study was terminated though when the participants discovered the role of the 'camp administrators' in the creation of intergroup friction. Unfortunately, the reactions of the participants were not further recorded in the original publications.

Billig (1976) argued that "This third group, the group of experimenters, is the social group which creates the other two groups – giving them their social meaning and their social reality" (p.307). However, the experimenters themselves did not seem to be aware of the role of a third group (themselves) in their studies. This lack of self-awareness as a powerful third group emphasises the exclusive focus on group dichotomy – the ingroup versus the outgroup (or the Rattlers versus the Eagles) – on the part of the researchers. Therefore the conclusions then drawn from the studies regarding intergroup conflict and discrimination related purely to a dichotomous group setting (the ingroup and the outgroup) which highlighted a competitive 'us versus them' perspective which has proliferated in social psychology (Kerr, Durrheim & Dixon, 2014).

The nature of interaction in the realistic conflict studies

Allowing interaction among participants in the context of the realistic conflict studies enabled an important aspect of social life to be studied. Namely, it showed how discrimination and cooperation *emerges over time* as a result of engaging in competitive and superordinate tasks, respectively (Sherif et al., 1961). Before the realistic conflict studies, explanations for discrimination were individually rather than socially based. For example, one explanation of prejudice was the theory of authoritarian personality (see for example: Adorno, Frenkel-

Brunswik, Levinson & Sanford, 150, as cited in Tajfel & Turner, 1979). Therefore "much of the work on the social psychology of intergroup relations (had previously) focused on patterns of individual prejudice and discrimination and the motivational sequences of interpersonal interaction" (Tajfel & Turner, 1979), without directly studying interpersonal interaction.

However, Reicher and Haslam (2013) criticise Sherif's approach to studying intergroup competition and cooperation in the context of the realistic conflict studies. They argue that there is a 'conformity bias' implicit in the design as Sherif and colleagues "assumed that the boys…would accept the changing social relations imposed upon them by the experimenters" (p. 120). This is even reflected in the naming of 'realistic conflict theory' which "posits that positive functional interdependence (cooperation) will lead to harmony and that negative functional interdependence (competition) will lead to conflict" (Reicher & Haslam, 2013, p. 120). However this approach failed to consider the active role of human beings who do not simply respond to the social setting as puppets on a social stage (Reicher & Haslam, 2014).

As Cherry (1995) showed, there was one entire study where it is very clear that the boys showed *active* engagement with the social context by "rejected(ing) the reality that Sherif tried to impose upon them" (Reicher & Haslam, 2013, p. 120). This resistance (as opposed to conformity) was never mentioned in Sherif and colleagues reports (Cherry, 1995; Reicher & Haslam, 2013).

Therefore, the nature of the social interaction in Sherif's studies could not be controlled by the experimenters. Arguably, this lack of control resulted in one whole study being terminated when participants actively – through interaction with one another – resisted the imposition of authority (or the manipulations of a powerful third group).

Tajfel and the Minimal Group Studies

Unlike the realistic conflict studies, the minimal group studies excluded interaction among participants in order to show how social categorization (simply being a member of an ingroup or an outgroup) by itself (rather than interaction in conflict-producing situations) could still result in discrimination (Tajfel et al., 1971). This led to the development of the social identity perspective (Tajfel & Turner, 1979) (described in detail later) which posited that ingroup identification and cohesiveness resulted from group membership and not intergroup conflict as suggested by research which drew on realistic conflict theory. However, the social identity perspective was not intended to replace realistic conflict theory but to supplement it (Tajfel & Turner, 1979).

Like the realistic conflict studies, the minimal group studies, further sedimented the two-group paradigm which still dominates social psychology (Hartstone & Augostinos, 1995; Kerr, Durrheim & Dixon, 2014). In addition, the exclusion of interaction, although intended to show that conflict between groups was not necessary for intergroup discrimination, also introduced theoretical problems (Aschenbrenner & Shaefer, 1980; Bornewasser & Bober, 1987) which will be explored later in the chapter.

Revisiting the minimal group studies

Extending the original minimal group studies has been explored for two important reasons which will be elaborated on throughout the thesis. The first reason is that the original studies were only

conducted in a two group setting; therefore most of these studies highlight the dichotomous nature of social identity (us versus them) which may to some extent exaggerate competition and ingroup bias (Hartstone & Augoustinos, 1995).

The second reason for extending the studies is that the original studies removed interaction among the participants from the experimental setting. However, norms and intergroup behaviour, as well as social identity, evolve over time in interaction with other social actors in the social environment (Reicher & Haslam, 2013).

Overview

The concept of studying intergroup relations in a minimal group setting was first explored by Ferguson and Kelly in 1964 (as cited in Brewer, 1979). However, it is best recognized in the study by Tajfel and his colleagues in the 1970s (Tajfel, 1970 & Tajfel et al., 1971). Their aim was to discover whether discrimination against an outgroup would occur in a setting stripped of social indicators (such as age, race, gender *et cetera*) and group category indicators (such as members' individual identities, any history of interaction among group members and between groups or traits common to a group). That is, group membership was based on "flimsy and unimportant criteria" (Tajfel, 1970, pp. 101) with no history of intergroup conflict and prejudicial attitudes.

Tajfel (1970) reasoned that because outgroup discrimination is such a common occurrence in a wide variety of settings regardless of how the ingroup and outgroup are constituted and despite the social economic and political context, that there must be some underlying psychological mechanism at work. Furthermore he argued that it was unlikely that this mechanism was purely related to competition (as suggested by realistic conflict theory) as the socioeconomic conditions in which discrimination occurs vary greatly and thus – although it most definitely plays a role in the perpetuation and cyclical nature of prejudice – competition could not be the only explanation. Intergroup classification (that is, dividing one's social world into 'us' and 'them'), Tajfel (1970) argued, was a means in which every individual makes sense of her/his social reality and is a principle of simplification and organization. Following this line of reasoning, Tajfel hypothesized that it would then be likely that outgroup discrimination would occur regardless of whether self-interest was involved or whether there was a conflict of interest or attitudes of intergroup hostility as he felt that there was a generic norm of outgroup hostility operating (he later rejected this norm explanation in favour of social identity theory – this will be discussed in greater detail later in the chapter). Thus the minimal group paradigm was way of eliminating these variables in order to test the above hypothesis (Tajfel, 1970).

Details of the experiment: Methodology

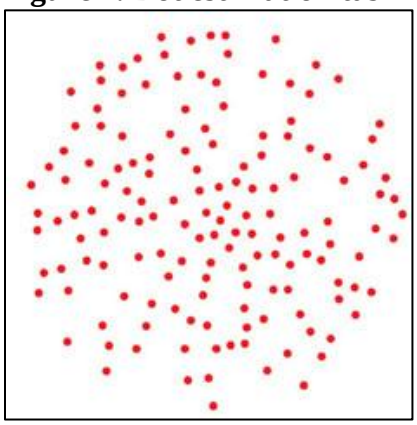
The first minimal group experiments were conducted in 1970 and published by Tajfel in 1970 (in a preliminary report) and 1971 in collaboration with Billig, Bundy and Flament. Intergroup categorization was studied "uncontaminated by other variables" (Tajfel, 1970, p. 99), which included interaction among individuals and pre-existing hostile attitudes between groups. Two main studies were conducted on teenage boys who were informed that the study was about judgment and decision making. Both studies made use of random assignment to ensure that the groups were equivalent before the experiment (Tajfel et al., 1971), although to the participants'

knowledge they were divided according to other criteria—estimation performance or artistic preference. Thus the experiment had two parts, the first being the random assignment procedure which participants were led to believe was a study in itself while the second part was the experiment of interest, that is, the minimal group study.

The bogus group allocation procedures

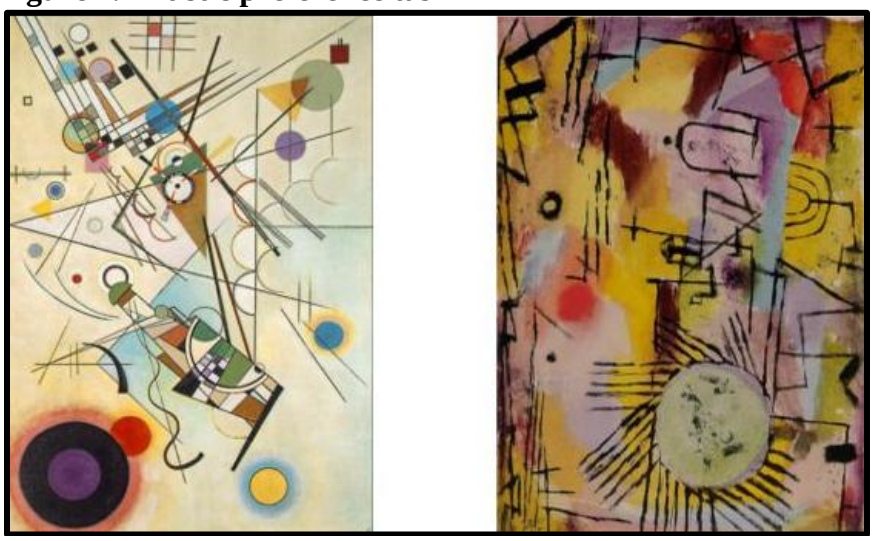
The two studies used slightly different bogus group assignment procedures. In study 1 the participants were under the impression that they were divided according to their performance as 'overestimators' or 'underestimators' on a dot estimation task. They were presented with a series of images of dots like the one shown in Figure 1. Participants were then asked to estimate the number of dots. Afterwards experimenters collected their estimates and left the room, returning sometime later to let them know that they had been divided into groups according to estimation similarities with other participants. However, participants were randomly assigned into groups.

Figure 1. Dot estimation task



In study 2 participants believed that they were grouped according to their aesthetic preference and not their performance on a dot estimation task. They were presented with two images – a painting from the artist Klee and one by the artist Kandinsky (see Figure 2). Participants were asked to choose which painting they preferred and were led to believe that their group membership reflected their preference in art.

Figure 2. Artistic preference task



The two different random assignment procedures were used in order to validate the assumption that *any* group categorization which is meaningless and 'flimsy' (Tajfel, 1970, pp. 101) will result in ingroup bias.

After the random assignment procedure, the participants were then informed that experimenters wished to do an additional experiment on decision making and judgment and would use the grouping from the previous task simply for the purpose of convenience.

The intergroup point allocation procedures

In the first study, the participants were asked to allocate points, either in the form of rewards or penalties, which represented a non-trivial sum of real cash incentives which they were to receive at the conclusion of the experiment. These allocations were to be made to two other participants (not including themselves), according to a set of matrices. First, participants were instructed to make two intragroup allocations. In other words, they were expected to allocate points between two members of the ingroup; and then allocate points between two members of the outgroup. Second, they were also asked to make one intergroup allocation. Here they were to distribute points differentially to a member of the ingroup and a member of the outgroup.

In both studies these allocations were made using matrices, which consisted of a set of forced-choice pairs. Participants had to select a pair of allocations to the two targets (an ingroup and outgroup member) from a fixed list of options. These matrices consisted of two rows of numbers, with each column representing a token allocation pair. The number on the top row represented the rewards or penalties due to one participant and the number on the bottom row, the other participant. See Figure 3 as an example of a matrix. For example, in Matrix 1 from Tajfel et al. (1971), if a participant chose the first option they would be taking 19 points from the first target and giving 6 points to the second target.

Figure 3. Example of matrices from Study 1

Table 2. *Matrices in Experiment 1*

A	*Matrix 1*	–19	–16	–13	–10	–7	–4	–1	0	1	2	3	4	5	6
		6	5	4	3	2	1	0	–1	–4	–7	–10	–13	–16	–19
	Matrix 2	12	10	8	6	4	2	0	–1	–5	–9	–13	–17	–21	–25
		–25	–21	–17	–13	–9	–5	–1	0	2	4	6	8	10	12

(Tajfel et al., 1971, p. 157)

Specific features of matrices used in study 1

In study 1, three different types of matrices were used. In matrix Type A, maximum penalties exceeded the maximum rewards meaning that participants could take away more points than they could award. Type B matrices did not allow for participants to take away points but only to award points differentially between two other participants. Finally, in matrix Type C, maximum rewards exceeded maximum penalties (thus it was the opposite of Type A).

Each type of matrix was repeated three times: first for allocating points to two members of the ingroup; second for allocating points to two members of the outgroup and third for the intergroup allocation (allocating points between ingroup and outgroup member).

Specific features of matrices used in study 2

The matrices used in study two provided different strategies for ingroup and outgroup token allocation. Each allocation pair (two corresponding points on the matrix) represented a strategic action for making allocations to an ingroup and outgroup member. For example, giving a roughly equal number of tokens to a member of the ingroup and a member of the outgroup could be considered to be a choice based on fairness. There were four strategies which included:

Maximum joint profit (MJP):

This strategy allowed participants as a whole to receive the maximum amount of money from the experimenters. In other words, this choice corresponded to the highest total number of points which could be awarded from the experiment. This was considered by Turner (1978) to be the rational strategy because participants as an experimental group would benefit from their participation in the study. If participants did not identify with their group (which was based on flimsy criteria) then this strategy would probably be the most likely choice. (Tajfel et al., 1971).

Maximum ingroup profit (MIP):

This choice corresponded to the highest possible number of points that could be allocated to the ingroup. MIP would determine whether participants showed ingroup favouritism and therefore

suggested some degree of identification with their group (otherwise they would choose MJP). (Tajfel et al., 1971).

Maximum difference in favour of the ingroup (MD):

This strategy was defined as the largest point difference between the ingroup and outgroup. Here, the ingroup member received more points than the outgroup member, however, not as many points as could be earned from the MIP strategy mentioned above. Therefore this strategy could determine whether participants were motivated by practical consideration toward their group or by a need to create the *difference* between their group and the outgroup. (Tajfel et al., 1971).

Fairness (F):

Finally, fairness was represented by a roughly equal number of points allocated to members of the ingroup and outgroup. (Tajfel et al., 1971).

Materials for study 2

Like study 1, in the second study there were different 'types' of matrices as illustrated in Figure 4 (Tajfel et al., 1971, p.164). Type A matrices were used to compare fairness (found in middle of the matrix) and ingroup favouristism (at the extreme right of the matrix) (Brewer, 1979). Type B matrices compared favouritism (on the left) with fairness (in the middle) and maximum joint outcome (on the right) (Brewer, 1979). Therefore the different types of matrices could pit one strategy against another in order to determine whether one strategy would be sacrificed over another (Bourhis & Gagnon, 2001). There were many versions of the matrices repeated in the same answer booklet which allowed researchers to see whether one strategy was consistently chosen over another. To prevent response bias, the matrices were varied in terms of which group (ingroup or outgroup) was represented in the top and bottom row respectively. As an additional measure, the order of the strategies was reversed in half of the booklets. In other words, the strategies were varied in their position on the matrix (either from right to left, or left to right) (Bornstein et al, 1983).

Table 6. *Matrices in Experiment 2*

Type A	Matrix 1	19	18	17	16	15	14	13	12	11	10	9	8	7	I	O	I	O
		1	3	5	7	9	11	13	15	17	19	21	23	25	O	I	I	O
	Matrix 2	23	22	21	20	19	18	17	16	15	14	13	12	11	I	O	I	O
		5	7	9	11	13	15	17	19	21	23	25	27	29	O	I	I	O
	Version $\frac{I}{O}$: MIP and MD opposite to MJP																	
	Version $\frac{I}{O}$: MIP, MJP and MD coincide																	
Type B	Matrix 3	7	8	9	10	11	12	13	14	15	16	17	18	19	I	O	I	O
		1	3	5	7	9	11	13	15	17	19	21	23	25	I	O	I	O
	Matrix 4	11	12	13	14	15	16	17	18	19	20	21	22	23	O	I	I	O
		5	7	9	11	13	15	17	19	21	23	25	27	29	O	I	I	O
	Version $\frac{I}{O}$: MIP and MJP opposite to MD																	
	Version $\frac{I}{O}$: MIP, MJP and MD coincide																	

Figure 4. Matrices from study 2

Procedure for analysis of matrices from study 2

As indicated by Figure 4, there were thirteen different allocation pairs per matrix. Each pair could be ranked according to its distance from the 'optimal' strategy being measured (explained in greater detail below). The data from the matrices was therefore analysed according to the mean rank scores of the strategy and not the difference scores which is the actual point difference between allocations to the ingroup versus the outgroup (Tajfel et al., 1971).

Using the mean rank score rather than difference scores enabled Tajfel and colleagues to systematically explore "the relative 'pull' exerted on the (subjects) intergroup decisions by some of the variables which appeared relevant" (Tajfel et al., 1971). In other words, this approach allowed one to determine the relative strengths of the strategies (Bourhis & Gagnon, 2001). According to Blank (2003), pull scores "reflect the degree to which the realization of one strategy keeps the participants from realizing another strategy (that is, "pulls them away" from the other strategy)" (para. 2).

The specific 'pull' of strategies was measured according to the type of matrix. Therefore matrix Type A compared maximum joint profit (MJP) with maximum ingroup profit (MIP) *and* maximum difference (MD) (which together represented ingroup favouritism (FAV)). Matrix Type B compared MD to the combination of MJP and MIP (Tajfel et al., 1971).

To explain how pull scores work, consider Figure 5. It shows two matrices (both Type A) where the allocations to the ingroup are reversed from the first matrix to the second matrix. In other words, the points to the ingroup are represented by the numbers on the top row in matrix1 and at the bottom in matrix 2.

Figure 5. Example matrices to calculate pull scores

Ingroup:	19	18	17	16	15	14	13	12	11	10	9	8	7
Outgroup:	1	3	5	7	9	11	13	15	17	19	21	23	25

Outgroup:	19	18	17	16	15	14	13	12	11	10	9	8	7
Ingroup:	1	3	5	7	9	11	13	15	17	19	21	23	25

Comparing how participants selected allocation pairs on these two matrices allowed the relative strength of FAV to be compared to MJP. This procedure was completed in steps. First, the position of the strategies were varied along these two separate matrices so in that in the first matrix, MJP and FAV were positioned on opposite ends while in the second matrix they were represented by the same allocation pair (Tajfel et al., 1971). For example, in the first matrix optimal FAV (MJP + MD) can be found on the extreme left (19/1) while MJP is positioned on the extreme right (7/25). However, in the second matrix the allocation pair on the extreme right (7/25) represents both FAV and MJP. The second step consists of ranking the allocation strategies according to how close they were to the optimal strategy being considered.
The allocations could be ranked in two manners. First, if one were measuring optimal FAV in matrix 1, the allocation pair on the left (19/1) would be given a rank score of 12. MJP (on the right, 7/25) would be given a rank of 0 (because it is the least optimal choice for FAV). Second,

if one was focusing on measuring the pull of MJP in the same matrix, the rankings would be in the opposite direction so that the extreme left allocation (19/1) would be ranked 0 because the lowest possible maximum joint profit could be earned by participants with this choice. In matrix 2 however, FAV and MJP are both given the score 12 (as they coincide) while the rank of the allocation pair on the extreme left is 0 (as it is farthest away from both strategies). Therefore with these rankings in mind, it is possible to calculate the difference between the choice in matrix 1 and in matrix 2 which is step three in the process of analyzing the pull scores. Calculating these differences in rank helps to determine 1) the pull of ingroup favouritism on maximum joint profit and, 2) the pull of MJP on FAV. It was these differences that were known as the 'pull scores' representing the effect that one strategy has on the realization of the another.

Pull scores enabled researchers to calculate whether participants would sacrifice getting the greatest amount of money from the experimenters (MJP) in order to show ingroup favouritism (MD + MIP), despite the groups being arbitrary with no material self-interest involved in the allocations (as participants could not allocated tokens to themselves). This method was preferred over simple difference scores – scores calculated from the difference in points allocated to the ingroup and outgroup – because they were more diversified and subtle (Bourhis & Gagnon, 2001). For example, they could not distinguish orientations (strategies) not allow one to determine whether one strategy was preferred over another (Bourhis & Gagnon, 2001).

A further justification behind this more complicated manner of analyzing the data lies in the fact that participants could be used as their own controls for any possible response biases (Bourhis et al., 1994), as multiple responses (each from a different matrix, with different positioning of strategies) could be analysed together.

The results of the minimal group studies

With regards to the findings from study 1, it was shown that for the two intragroup allocations, maximum fairness was achieved while for the intergroup allocation there was outgroup discrimination wherein more tokens were allocated to the ingroup. Due to limitations apparent in this study, namely that introducing penalties was a "complicating variable" (Tajfel et al, 1971) as well as the fact the matrices did not offer differing strategies which would help determine motivation for intergroup behaviour (Tajfel et al, 1971), the second study (for which the methodology has already been described above) was conducted.

Study 2 resulted in some interesting findings regarding ingroup bias. The first was that for the intragroup allocations, maximum joint profit (MJP; that is, getting the most money from the experimenters) was the strategy employed for the ingroup allocations but not in the outgroup allocations. This showed that ingroup bias existed even in indirect intergroup settings. This was based on the fact that the outgroup was not awarded the same amount as the ingroup when comparing the intragroup allocations (Tajfel et al., 1971).If participants had treated the ingroup and outgroup similarly then one would expect that for the intragroup allocations, there would be no difference in the tendency to choose MJP as the allocation strategy.

Next, in terms of the intergroup point allocations, participants tended to maximize the difference between the ingroup and the outgroup in favour of the former. This was determined by studying the data collected from matrix Type B, described above, which compared MD with MIP and

MJP. The pull of MIP and MJP on MD was weak which suggested that winning, rather than gaining the most money from the experimenters, was the most important strategy for group members. In other words, participants were willing to sacrifice the most number of points they could attain for an ingroup member in favour of maximizing the point difference between an ingroup and outgroup member (Tajfel et al., 1971). These findings of maximum difference have since been replicated in studies by Doise et al. (1972); Doise and Sinclair, in press; Tajfel & Billig, in press and Turner, 1972 (in Billig & Tajfel, 1973).

Tajfel et al. (1971) concluded that even in conditions where the 'usual trappings' (p. 172) of group membership are removed and where interaction with the outgroup is non-existent and self-interest is not involved, participants still act in terms of their group membership by favouring the ingroup despite an available alternative strategy which represents the common good (that is, maximum joint profit, getting the most amount of money from the experimenters).

Fairness was also reported to be another powerful social norm which guided participants' choices as *all* allocations were not too far from the point of maximum fairness (Tajfel et al., 1971). In other words the allocation pairs were not at the extreme ends of the possibilities that the matrices allowed. The extreme ends represented the 'optimal' version of the strategies of ingroup favouritism and maximum difference (already discussed). Tajfel (1970) even went so far as to assert that "*All* of the choices in the experiments can be conceived as tending to achieve a compromise between F (fairness) and the other variables" (p. 173., emphasis on the original, as cited in Condor, 2003).

However, Tajfel (1970) still concluded that although fairness was evident in the experiment, it was hard to see this tendency toward fairness at work in real-life settings especially as "groupness" was usually far more weightier than that in the minimal group setting and socialization into groups, more powerful (Tajfel, 1970). Thus fairness was seen as a balancing tendency to "groupness" (ingroup bias) (Tajfel et al, 1971). Later, Condor (2003) noted that although fairness was first reported as a significant strategy, this was lost in future theorizing while ingroup bias was emphasized. Fairness was denigrated to "modify(ing) the excess" (Tajfel, 1974b, p. 68, as cited in Condor, 2003) of ingroup bias and not explored in greater detail.

Critique

A lack of interaction emphasizes the individual versus the social

One of the major critiques of the original minimal group experiments is that they did not allow for interaction among participants to occur due to the nature of the design, which was a paper and pencil test measuring once-off decisions on the part of individual group members. Aschenbrenner and Schaefer (1980) argue that the minimal group paradigm is a "rather narrow and somewhat artificial experimental situation" (p. 397) which may not be of such great interest due to the questionability of how the results can be applied to more realistic group settings. In 'more realistic settings' people interact over time, and, according to Reicher and Haslam (2013) are "engaged followers", and not passive recipients of authority, the status quo or societal norms.

Reicher and Haslam (2013) argue that much of social psychology has removed agency from people resulting in a conformity bias, in which social actors are seen as passive reactors to the

social setting. This critique can be applied to the minimal group studies as participants were forced to make a choice on a matrix and were not given creative agency, resulting in limitations in terms of what social actions participants could take. The researchers determined prior to the experiment what social actions were deemed worthy of study and then only allowed participants to make choices based on these predetermined strategies.

This approach to treating participants as passive beings (and experimenters as the authority) makes it "impossible to apprehend the constraints, concerns, opportunities and perspectives which shape what people do and in relationship to which their behaviours are meaningful" (Reicher & Haslam, 2013, p. 114). One of the ways in which this occurs is through not considering how social actors actively create meaning in the social setting and how they shape (as well as are shaped by) the social environment. This highlights the importance of interaction (specifically the two-way interaction of the social context on people as well as people on the social context) (Reicher & Haslam, 2013).

"Human nature is frozen by ignoring human society" (Reicher & Haslam, 2013, p. 114) and this is what occurs when one treats participants in experiments (and thus human beings more generally) as not having agency. This notion of humans as "puppets," as acting primarily in response to situational cues (Reicher & Haslam, 2013, pp. 114), is created by ignoring the unique features of the social context. A fundamental part of this context is interaction.

Interestingly enough Tajfel had an awareness of this predating the minimal group studies. In fact Tajfel (1970) was against what he termed the "blood and guts model" (p. 128) of intergroup conflict which emphasizes the inherent aggressive nature of human beings. This is because he believed that it could not adequately account for the fact that intergroup hostility (for example, war) was not constant but rather that it comes and goes and thus is linked to social and historical conditions (as cited in Billig, 2002). However, despite this acknowledgement, the minimal group experiments play into this notion of humans not having agency due to the fact that participants were not afforded the opportunity to interact over time and shape other social actors' behaviour or the social environment (as well as being shaped by these in turn).

Furthermore by removing interaction from the experimental setting, Bornewasser and Bober (1987) argue that the minimal group studies cannot, in fact, clearly distinguish interpersonal from intergroup behaviour. This is because what is conceptualized as a group in the original study is not in fact a "Gestalt" group with the properties (such as goals, roles, values, norms and organisation) and structure (relational arrangements of people) required to be considered a group, but rather simply an abstract category to which individuals belong based on their similarity on one property (for example, perceived artistic preference). Therefore categorisation and identification, which are not linked to group structure in the original paradigm, can only been seen as "trivial preconditions of any classification" (p. 271) and are "neither necessary of sufficient" (p. 271) for group formation and intergroup behaviour.

In summary, the approach to studying intergroup behaviour through the exclusion of interpersonal interaction in fact emphasizes individual cognitive processes, whereas Bornewasser and Bober (1987) rightly argue that social psychology should be of a non-individualistic nature. Therefore the groups created in the minimal group paradigm are too minimal and this can, in

part, be overcome by including interaction among group members (that is, allowing the crucial relational property of groups to exist (Bornewasser & Bober, 1987)) as well as interaction between groups in order to distinguish intergroup behaviour from interpersonal behaviour.

The lack of interaction in the minimal group studies can be traced back to the use of matrices in which participants made once-off decisions using a pen-and-paper format which eliminates interaction from the experiment. The lack of interaction was just one of the problems with the use of the matrices and a critique of the matrices themselves follow.

Critique of Tajfel's matrices

Tajfel's matrices have been criticized by many authors (Brewer, 1979; Aschenbrenner & Shaefer, 1980; Gaertner & Insko, 2001; Locksley, Orwitz and Hepburn, 1980; Bornstein et al., 1983; Ng, 1981). The criticisms leveled against this procedure include that: it eliminates interaction among participants; it is far too complicated which possibly leads to interpretation issues; and it confounds strategies. I will discuss these criticisms in turn.

The matrices do not allow for interaction or agentic responses

As already discussed in detail above, the procedure for studying intergroup relations through the use of pen and pencil format eliminates social interaction. Participants were isolated from one another and completed the matrices in a room alone (Tajfel et al., 1971). This meant that they had no contact with the other participants (ingroup or outgroup members) at any point in the experiment. Furthermore, participants were given a predetermined selection of strategies but could not choose their own manner of allocating tokens. Some authors argue that this may have meant that the social setting was therefore too minimal (see for example: Aschenbrenner & Schaefer, 1980)

The matrices are complicated

Calculating rank scores from a multitude of different matrices and using these, in turn, to calculate pull scores in order to determine the relative strengths of strategies is a fairly complicated and mathematically involved procedure. Although Tajfel et al. (1971) acknowledged that the procedure regarding the matrices is quite complicated 'on paper'; they argued that in terms of the use of them *by the participants* to make their decisions regarding the point allocation, they were "easy and simple" (Tajfel et al., 1971, p. 172). In other words, participants were not confused by the allocation strategies as they were unaware of how these strategies were going to be compared and calculated. They simply had to make a one choice out of thirteen when presented with each matrix. Therefore the task itself was straightforward.

Therefore, on one hand, Tajfel et al. (1971) argue that although mathematically complex, the matrices are straightforward in practices and allow for the comparison of the relative strength of different social strategies. On the other hand, critics argue that the use of the matrices is not ideal because it does not allow for interaction (as already mentioned) and furthermore that it confounds different social strategies (discussed in detail below).

The matrices confound distinct social strategies

One criticism which has been supported by several authors is that the matrices may lack validity as they confound several social orientations. In particular, Brewer (1979) argues that the matrices are not "systematically varied to compare favoritism with all possible choice combinations" (p. 309). She highlights that, for example, the strategy of maximum difference in favour of the ingroup (that is, creating the largest point gap between an ingroup and outgroup member in favour of the former) is confounded with maximum ingroup profit (that is, the maximum number of tokens for the ingroup). In other words, to achieve the maximum amount of points for the ingroup, one would have to choose the first strategy which has the perhaps unintended consequence of creating the largest point gap between the ingroup and outgroup. Therefore this may have inherently resulted in discriminatory behaviour by virtue of the fact that the absolute gain for the ingroup could only be achieved at the outgroup's expense.

Bornstein et al. (1983) supports the above argument and reiterate that Tajfel's matrices in fact only present three strategies or social orientations; resulting in the confounding of several possible motives. Therefore, these authors created a new set of matrices that allowed for seven social orientations – all of which available to the participant simultaneously, unlike in previous experiments which only pitted certain strategies against one another at a time. In one of their experiments with the revised and unconfounded matrices, they found that participants did not select maximum difference in favour of the ingroup any greater than chance (in contrast to the Tajfel et al. study). However, the study did still find evidence of overall intergroup discrimination as maximum joint own profit and maximum own profit were selected over and above the strategies that favoured the outgroup. In other words, participants still showed ingroup favouritism. Furthermore, like the original studies using the original matrices and calculations, the strategy of fairness (represented by minimising the difference between the ingroup and the outgroup) was still significant. Thus even with the new matrices, the findings of the original experiments held; although the strength of ingroup bias was lower because maximizing the difference between the groups by sacrificing maximum ingroup profit was not apparent.

Therefore, by comparing the new alternative matrices with the Tajfel matrices Bornstein et al. (1983) concluded that that although they are not invalid, Tajfel's matrices are potentially misleading as they suggested that participants were willing to sacrifice their own highest point allocation for maximizing the difference between the groups, thus supporting the theory that they were trying to create positive psychological distinctiveness from the outgroup, when in fact, this may not be the case.

Furthermore, Locksley, Orwitz and Hepburn (1980, as cited in Bornstein et al., 1983) criticized the matrices for explicitly providing the option for ingroup favouritism which may have increased the likelihood that someone would act in a biased manner; perhaps due to an experimenter effect (Aschenbrenner & Schaefer; 1980). Furthermore, Aschenbrenner and Schaefer (1980) argue that consistent patterns in point allocation could be as a result of response bias whereby some participants are consistently drawn to the middle of the scale or to either end, regardless of which strategy these positions represent.

Due to the three primary criticisms against the matrices – namely they do not allow for social interaction, they are mathematically complicated and they are possibly methodologically problematic in themselves – the minimal group paradigm may benefit from alternative approaches to the methodological set up.

The role of the MGP studies in emphasizing group dichotomy

The original minimal group experiments, and many, if not all, of the replications that followed, were only conducted in a two group setting, thereby further sedimenting the two-group paradigm in minimal groups and in social psychology more generally. Consequently this constrained the types of social psychological phenomena open to study – for example, excluding the study of intergroup alliances between two groups to the exclusion of a third.

According to Harstone and Augoustinos (1995), adding a third group to the design is a logical extension of the paradigm as "intergroup relations often reflect multiple group settings" (p. 180). Furthermore, Wagner, Lampen and Syllwasschy (1986) argue that adding a third group to the two-group minimal group paradigm is an improvement due to the fact that "in some conditions in everyday life…people are not usually conscious *only* [emphasis added] of antagonistic group memberships" (p. 22). The antagonistic group memberships these authors are referring to are the highly competitive and discriminatory "us versus them" situations, which inflates ingroup bias (Harstone & Augoustinos, 1995). Therefore other, non-antagonistic interactions – such as intergroup alliance or solidarity – cannot be studied by employing a two-group paradigm.

Including a third group to the traditional bipolar model of group membership, enables less simplistic questions regarding intergroup relations and ingroup bias to be studied. Furthermore, it allows one to test the robustness of the findings from the original minimal group studies particularly relating to levels of ingroup bias in multigroup hierarchies, as it may be a 'cleaner' measure of ingroup bias (Wagner et al., 1986), that is, it is not confounded by purely antagonistic and competitive settings.

Studies in the Minimal Group Paradigm that include a third group

The critiques of the two-group paradigm provide a compelling argument for considering multi-group relationships in minimal group studies. However, only two studies which explore three-group minimal group settings can be found in the literature.

The first study was conducted in 1986 by Wagner et al. (1986) who hypothesized that groups who had low self-esteem as a result of a negative comparison to a superior group, would devalue the second outgroup as an identity management strategy to improve their own social standing. The was based on the social identity perspective arising from the original minimal group studies which will be discussed in detail a little later in the literature review.

Participants (who were university students) were told that they would be rating the discussion ability of other students from different faculties. They completed this task in isolation, making their judgments from audio recordings. At the beginning of the experiment, participant's initial ingroup status was manipulated in three conditions. In condition 1, they were told that law students (the participants' ingroup) generally fared worse than economic students in discussion

ability. This was known as the categorization-devaluation condition where the ingroup had a lower status than the outgroup (the economics students). In condition 2, they were made aware that comparisons had already been made but not aware of the outcome of these comparisons. In the final condition (the control condition) participants were unaware of existing comparisons between departments.

After participants had completed the task of rating students from different departments, they completed post-experimental questionnaires to measure self-esteem. The aim of this experiment was to see whether participants who had comparatively lower status to the outgroup (and thus lower self-esteem) would rate a second outgroup worse than if there was no status difference.

The results of the study did not support their hypothesis. Students in the low status condition were not more likely to score students from a second outgroup poorly (compared to the other two conditions). The authors argued that perhaps this was due to the social desirability of the participants. In other words, students perhaps did not want to be viewed as unfair to their fellow university students, even if these students were from different departments (Wagner et al., 1986). Although the hypothesis was not supported, this experiment does highlight how a three-group setting can open up avenues of research inaccessible to the two-group paradigm.

The second three-group study was conducted by Hartstone and Augostinos in 1995. They wished to study ingroup bias in a three – as opposed to two-group setting – to see whether there would be any differences in the strength of bias across conditions. They hypothesized that ingroup bias would be reduced when a third group was added to the setting. This is because, they argued, a two-group setting is innately more competitive due to the stark 'us versus them' dichotomy present and adding a third group reduces the saliency of competition. Their hypothesis was supported as they did not find significant ingroup bias present in a three-group setting.

Therefore, Hartstone and Augostinos (1995) concluded that self-categorisation into a group (that is, to identity oneself as a member of one group or another) appears stronger in a dichotomous group setting, which results in increased levels of ingroup bias. However, this is not to say that ingroup bias does not exist in multiple group settings. For example, ingroup bias is still apparent in real world settings in which there are multiple groups (Hartstone &Augostinos, 1995). The findings of decreased levels of ingroup bias when a third group is introduced does, however, provide a basis for critically questioning the results from the original minimal group studies.

Both the above studies point to the importance of extending the minimal group paradigm and consequently, the body of theory arising from it, in order for application to broader multigroup contexts. Specifically, one "must consider mechanisms other than, or additional to, those cognitive and psychological factors that operate in the two-group situation" (Hartstone and Augostinos, 1995, p. 189).

The impact of the minimal group studies in social psychology

Despite the criticisms of the original minimal group studies presented above, these studies have become highly influential in social psychology (Billig, 2002) and rightly so. Compared to Sherif's realistic conflict studies (Sherif & Sherif, 1961), the minimal group studies showed that there need not be external causes for ingroup bias to occur. Instead ingroup bias could result

merely from categorization in an arbitrary and meaningless group. In other words, group categorization (and not intergroup conflict and competition) was the *minimal condition* (a necessary and sufficient condition) for ingroup bias to arise (Tajfel et al., 1971; Tajfel & Turner, 1979). This conclusion could only be reached by stripping away all other social variables (Tajfel et al., 1971), (variables such as interaction).

The finding that group categorization is the minimal condition for development of ingroup bias suggested that there was some internal (cognitive) process that takes places which drives ingroup bias (Billig, 2002). Tajfel suggested that this cognitive process was the need for self-esteem based on the social identity of the group (described in detail below) (Tajfel & Turner, 1979). Bourhis and Gagnon (2001) argued that "during the last three decades a large number of studies have corroborated the link between social categorization, ingroup identification and intergroup discrimination" (p. 90) thus providing support for the original studies and the theory that followed. The conclusions, ideas and explanations behind the minimal group studies are widely accepted in the field of social psychology and furthermore they are "finding their way into new areas" (Turner & Reynolds, 2003).

As Billig (2002) argues, the minimal group studies were crucial as they became foundation for Tajfel's intergroup theorizing. This body of theory, or 'Tajfel's legacy' (Billig, 2002, p. 172), became known as the social identity perspective.

The birth of the social identity perspective

This section of the chapter will introduce the social identity perspective which will be used as the theoretical framework in the present thesis. While this body of theory found its origins in the minimal group studies and has become highly influential in social psychology, it is still being developed and extended. The social identity perspective comprises of two interdependent aspects: social identity theory and self-categorisation theory. It is important to emphasise that the notions of social identity and self-categorisation dovetail and are complementary. In other words, one is not a replacement for the other (Turner & Reynolds, 2003). Both will be presented and discussed under separate subheadings for the sake of clarity, not to create a false division between them.

Next, extensions to the social identity perspective will be presented in order to theorise social change. These more recent extensions form the basis of collective action models such as the Politicized Collective Identity Model (Simon & Klandermans, 2001) and the Political Solidarity Model of Social Change (Subašić et al., 2008). These two models have explicitly criticized the body of theory and research in this tradition for placing too much focus on group bipolarity. Both the criticisms against the two-group paradigm and the models themselves will be discussed as they inform the theoretical backdrop to the current thesis.

Group categorization as the sufficient condition for discrimination

The minimal group studies, which have been discussed in detail in previous sections, led to the development of social identity theory (Tajfel & Turner, 1979) which was later extended to elaborate on self-categorization (Turner, 1985), together forming the social identity perspective.

Tajfel et al. (1971) concluded from the minimal group studies that mere social categorization into one of two groups results in ingroup bias. In other words, the simple act of assigning people to meaningless groups results in discriminatory behaviour, therefore this 'groupness' is the minimal condition for prejudice. In 1973, Billig and Tajfel replicated and extended the minimal group study in order to distinguish the effect of group categorization (assignment into meaningless groups) from the possibility of perceived similarity that one may develop regarding fellow ingroup members (since participants were misled to believe they shared artistic preference in the original experiments). In other words, they wondered whether ingroup bias would occur when group categorisation was known to the participants to be random.

In the original study, participants thought that they were grouped according to their similar performance on a task or their similar taste in artwork, and this perceived similarity could be what was driving ingroup bias especially as it has been found in previous studies (reviews by Byrne, 1969; Simons et al., 1970 in Billig & Tajfel, 1973) that people are attracted to (and therefore might favour) similar others. For example, people are attracted to those with similar personalities or socioeconomic status or even to those with trivial similarities such as attitudes toward gardening (Billig & Tajfel, 1973).

In the original minimal group study, participants were led to believe that they were similar to one another, even if these similarities were "flimsy and unimportant" (Tajfel, 1970), as they had no knowledge of the random assignment procedure (Tajfel et al., 1971). Therefore, in this replication, participants were explicitly made aware that their group membership was random and not based on any commonalities between group members. It was found that even in explicitly random groups, ingroup bias still exists "as soon as the notion of 'group' was introduced" in the experimental instructions (Billig & Tajfel, 1973, p. 22).

The findings from this study were important as they establish that group categorization, even categorisation into minimal groups (which are utterly meaningless in their creation and known to be so by the group members) result in ingroup bias thus validating and clarifying the conclusions of the original study.

Social identity and social comparison

The theory that Tajfel et al. (1971) originally used to explain how group categorization could result in the intergroup discrimination present in the minimal group studies was that of a generic social norm. They suggested that outgroup discrimination is inherent to social categorization but this was later rejected in favour of the social identity perspective (Condor, 2003). Although it was maintained that at a sociological level these generic norms can help, to some extent, explain intergroup discrimination; Billig and Tajfel (1973) argued that this can only be considered at the first level of analysis. Therefore, in the replication of the minimal group study by Billig and Tajfel (1973) this normative explanation was revised and social identity theory (Tajfel & Turner, 1979) was introduced.

Tajfel and Turner (1979) argued that an individual's sense of being is comprised of two levels: a personal (individual) identity and a social identity. In intergroup settings, one's *social identity* becomes salient – and this level of identity interacts with, and informs, one's personal identity.

Furthermore, identity is linked to self-esteem in that a positive social identity results in high self-esteem while a negative social identity is damaging to one's self-esteem. Social identity theory therefore postulated that ingroup bias arises as a strategy to improve the aspect of self-esteem tied to group membership (that is the social identity) (Tajfel & Turner, 1979).

Building on the above notion, a crucial goal for people is to develop and maintain high self-esteem – and self-esteem linked to social identity can only be positive if there is a positive differentiation between one's group (the ingroup) and a comparison group (the outgroup). In other words, "the notions of social identity and of intergroup social comparison lead directly to a third notion, that of the establishment of psychological distinctiveness" (Billig & Tajfel, 1973, p. 49).

Therefore, in order to build and maintain high self-esteem linked to both levels of identity, one needs to perceive that a positive distinctiveness exists between one's ingroup and the outgroup/s. To achieve positive distinctiveness, ingroup members need to have higher status on some criterion, for example wealth. Therefore, in order to compare favourably to other groups, the ingroup will act in a manner that improves their position in the social structure. This is achieved by acting in ways that favour the ingroup and discriminate against the outgroup.

The findings from the minimal group studies showed how group members were willing to sacrifice overall ingroup profit in order to create the greatest *difference* between the ingroup and the outgroup (through choosing the strategy of maximum difference rather than maximum own), thereby creating psychological distinctiveness. Therefore, it is postulated that it is through this process of self-esteem building and maintenance related to social identity that prejudice and discrimination arise.

In intergroup settings, individuals become aware of themselves as members of a group. Tajfel and Turner (1979) argued that it is inevitable that the ingroup will draw comparisons to the outgroup/s, affecting the valuation of the social identity of the group; and therefore the self esteem of the group members. Ingroup bias occurs through this process of social comparison (Tajfel & Turner, 1979 in Subašić et al., 2008) as the ingroup seeks to achieve a positive distinctiveness from the outgroup/s. Therefore status divisions and differences are emphasized and these differences in status and power are contested over. This allows the ingroup move to the top of the social hierarchy to satisfy social psychological needs – namely, positive group identity and high self-esteem.

Self-categorisation

If social identity and social comparison (described above) can result in ingroup favoritism and outgroup discrimination, then a fundamental aspect to the social identity perspective is the process through which individuals come to see themselves of members of a particular group in the first place. The initial presentation of social identity theory (Tajfel & Turner, 1979) could not account for how and why individuals would categorise themselves into groups, nor could it account for the possibility that an individual may hold multiple social identities. Therefore, self-categorisation theory was developed by Turner (1985) as a complement to social identity theory. One of the benefits of this extension to social identity theory is that self-categorisation into

groups allows one to understand social phenomena such as group formation and cohesion, as well as social cooperation and solidarity (Turner & Reynolds, 2003).

In order to share a social identity with a group, an individual must categorise themselves as members of one group over another group/s. This is referred to as the process of social categorization (Turner, 1985). Categorising oneself and others into distinct groups enables intergroup interaction and, consequently, allows group life to become possible. This categorization process, in itself, is sufficient for ingroup bias to develop. This was demonstrated by the original minimal group studies which found that categorizing participants into meaningless groups resulted in ingroup bias despite a lack of interaction between groups, intergroup history or conflict and the anonymity of group membership.

Self-categorisation occurs through depersonalization, a process wherein individuals come to see themselves as exemplars of their social group – somebody who embodies all the characteristics of a typical member of the group (Turner, 1985). Byproducts of depersonalisation include: the minimization of ingroup differences and the enhancement of similarities between ingroup members; and the exaggeration of differences to the outgroup (Tajfel & Turner, 1979 in Dovidio, Saguy, Gaertner & Thomas, 2012). In addition to the enhancement of outgroup differences and ingroup similarity, individuals also tend to retain, more readily, positive information related to the ingroup compared to the outgroup and furthermore, negative information about the ingroup is more likely to be ignored (Tajfel & Turner, 1979 in Dovidio et al., 2012). Therefore these two antecedents of self-categorisation can lead to prejudice (Dovidio et al., 2012).

The concept of self-categorisation was extended to account for social identification which could occur among groups (where two distinct groups come to identity with one another). This concept will be explored in the extensions to the social identity perspective presented later in the discussion.

Social change strategies: social creativity or social competition?

According to the social identity perspective, Tajfel and Turner (1979) argue that the primary aim for any individual is to establish or maintain a positive social identity in order to have high self-esteem – a basic psychological need. Therefore, in cases where a negative social identity exists, individuals will seek to change this. Consequently, social change can be conceived of as a change in social identity. The body of theory related to the social identity perspective was developed with the social change process in mind, asking: "When will members of a low status, disadvantaged social group perceive themselves as such and act collectively in order to challenge and change a system of intergroup relations that disadvantages them?" (Subašić et al., 2008, p. 332).

The 'sociostructural' variables of the social identity perspective

In the instances where groups are conferred a low status position in the hierarchy there are two options open to them to improve their self esteem: social mobility (changing one's group membership, a personal strategy) and social change (which consists of either social creativity or

social competition) (Tajfel & Turner, 1979). Which strategy low status individuals choose depends on a variety of so-called sociostructural variables. I will briefly introduce the sociostructural variables before describing the social strategies.

The sociostructural variables include:

Boundary permeability

Permeability refers to the ability of individuals to change group membership. If group boundaries are permeable, then individuals can 'cross' from one group to another which would result in a change in social identity. If group boundaries are impermeable, then individuals are 'stuck' in their group (Tajfel & Turner, 1979).

Status legitimacy

Another influencing factor in the choice in social creativity versus social change strategies is the perceived legitimacy of the social hierarchy. Status legitimacy is the belief that the differences between the groups (on a particular criterion, be it wealth, access to information et cetera) is somehow fair and justified. On the other hand, perceptions of illegitimacy occur when the status of groups does not seem to be based on a just procedure (Tajfel & Turner, 1979).

Status stability

Finally the stability of the social hierarchy refers to the extent to which change can be imagined. In other words, a stable social structure is one that is viewed as static and unlikely to change while an unstable social structure appears to be more open to change in the relative status of groups (Tajfel & Turner, 1979).

Based on these perceptions of the social setting, when faced with low self-esteem related to poor social identity an individual can either engage in social mobility or social change strategies:

Social mobility

First, individuals will try to employ the individualistic strategy of social mobility. In other words, they will attempt to shift their group membership from a low status to a high status group. This is only possible if group boundaries are permeable (that is, it is plausible to switch group membership; for example, it is possible to change one's economic class but not one's race group). However, where impermeable group boundaries exist, members of the low status group are likely to implement social change strategies.

Social change

Social change strategies are drawn on when individual mobility into a higher status group is not possible (this strategy is the focus of the current thesis). Therefore, individuals, *now acting as members of a group*, need to find alternative approaches to improve their social identity and self-esteem as a whole. They can do this by changing the status of the group: either through social creativity which does not involve changing their actual position in the social hierarchy; or

through direct social competition with the high status group with the aim of changing their position in the social hierarchy.

Social creativity

Social creativity strategies are strategies which enable the formation of positive distinctiveness "by redefining or altering the elements of the comparative situation" (Tajfel & Turner, 1979, p. 43). In other words, members of the low status group will either find another dimension for comparison (one in which they fare better – for example, dance ability instead of wealth) or they will compare themselves to a second outgroup that is worse off than them (for example, a poorer outgroup).

Social competition

The second social change strategy is social competition which can be described as direct competition with one or more outgroups. In other words, the low status group attempts to reverse the relative positions of the groups in the hierarchy. This strategy is usually implemented when the social hierarchy and power differentials between groups is seen as illegitimate (or unfair) and where the social structure is viewed as unstable (they can imagine the possibility of change). In the social competition strategy, as its name suggests, intergroup competition occurs between groups; in other words, the low status group directly attempts to compete with the high status group.

Tajfel and Turner (1979) defined social competition primarily in terms of the two-group paradigm, in which a group "may try to reverse the relative positions of the in-group and the out-group on salient dimensions" (p. 44) which may "imply change in the group's objective social location" (p.44) (that is, the social structure of the intergroup hierarchy). This definition perhaps downplays the social complexity of competition which may exist in a three (or more) group setting. Furthermore, for social competition to be successful ingroup solidarity (or group cohesion) against the outgroup is crucial but later theorists have argued that intergroup alliance and solidarity with a second group against the outgroup is an important avenue for exploration in multigroup settings (see for example Simon & Klandermans, 2001; Subašić et al., 2008) – this will be further discussed later in the chapter.

Critique of the social identity perspective

The specific way that the minimal group studies were reported served to bolster social identity theory

The minimal group studies highlighted the psychological need for groups to positively differentiate themselves from the outgroup/s in order to achieve a positive social identity. This finding formed the base from which the social identity perspective was developed. However, as will be further discussed below, the (perhaps undue) emphasis placed on ingroup bias in the form of positive distinctiveness (maximizing the difference between the groups), along with underplaying the role of fairness, served to bolster this theory (Condor, 2003).

It is argued that Tajfel and his colleagues had emphasized the strategy of maximum difference *because* it supported social identity theory and the notion that group members try to create positive group distinctiveness through ingroup bias in order to boost their self-esteem (Bornstein et al., 1983). However, experiments conducted by Bornstein et al. (1983) with alternative matrices indicated that maximum difference was not favoured more than maximum ingroup profit and it was not even a significant strategy with female participants. Therefore positive distinctiveness may not be the goal in intergroup relations, shedding some doubt on the role of self-esteem (as it relates to social identity) on ingroup bias.

In the original studies, fairness was reported to be another powerful social norm which guided participants' choices but it was only conceptualized as a balancing tendency to "groupness" (that is, ingroup bias) (Tajfel, et al., 1971), thus diminishing its importance. Although fairness was a powerful norm in the MGP, Tajfel (1970) concluded that it was hard to see this tendency toward fairness at work in real-life settings especially as "groupness" was usually far more weightier than that presented in the minimal group setting (as groups are not arbitrary, have a history of interaction *et cetera*) and socialization into groups, more powerful (Tajfel, 1970).

Condor (2003) notes that although fairness was at first reported as a significant strategy, this was lost in future theorizing (including in the social identity perspective) while ingroup bias was emphasized. This was because fairness was denigrated to "modify(ing) the excess" (Tajfel, 1974b, p. 68, as cited in Condor, 2003) of ingroup bias and not explored in greater detail. The seemingly important strategy of being fair was arguably not given enough emphasis in the original study and the replications that followed.

The three-group paradigm possibly inflates ingroup bias

In addition to the almost exclusive focus on ingroup bias in the way in which the minimal group studies were reported (discussed above), the design of the minimal group setting itself may have inflated ingroup bias. For example, due to the almost exclusive use of the two-group paradigm, the effect which adding a third group may have on ingroup bias was not explored. As we have already seen, Hartstone and Augostinos (1995) argued for, and found some evidence of the possibility that the stark dichotomy inflates competition (in the form of ingroup bias) between groups. This calls into question the applicability of these results to a multigroup setting, therefore questioning the applicability of the social identity explanation for intergroup behaviour in more complex social situations.

The role of norms was downplayed in the minimal group studies and in social identity perspective

As mentioned previously, Tajfel did a "*volte face* concerning the question of interpretation" (Condor, 2003, p. 167). He replaced his initial explanation for ingroup bias as a generic norm with the social identity explanation. Perhaps dismissing the role of norms may have been slightly premature.

Different population groups may in fact show different norms for intergroup allocations in the minimal group setting. Most of the original minimal group studies were only conducted on

teenage boys although in a few experiments where female participants were introduced whilst maintaining the original procedure; no major gender differences in social orientations were reported (Brown & Turner, 1979; Turner et al., 1979; Vaughan, Tajfel & Williams, 1977 in Bornstein et al., 1983). However in the experiments conducted by Bornstein et al. (1983) with the improved matrices, there were gender and age differences in social orientations. For example, older participants favoured minimum difference (fairness) while maximum difference in favour of the ingroup (positive distinctiveness) tended to be favoured by younger participants. The differences found between age and gender groups in fact may suggest that Tajfel's initial interest in social norms (Tajfel, 1970; Tajfel et al., 1971) was not unjustified.

In addition, as the original studies excluded interaction between participants; it is argued that perhaps the explanations for the findings are more individually based than social psychological in nature (Bornewasser & Bober, 1987). In other words, social identity theory is less a social theory of ingroup bias as it is an individual psychological theory which explains social behaviour on the part of the individual. This argument has already been made earlier in the chapter. The role of social norms could add a more 'socially-based' dimension (Condor, 2003).

Furthermore, if social norms were considered (as was initially the intention) they would only be open to study conceptualized as static phenomena which have a one-way influence on participants. This is due to the fact that participants made choices for allocations in isolation from groups; therefore the two-way role of social norms could not be adequately addressed in the conventional MGP. Tajfel (1970) in his initial explanation for the methodology of the minimal group studies, argued that stripping the social setting to the bare essentials (group membership) would force the participants to draw on generic social norms to inform their behaviours (norms which already 'existed' in society) as participants had limited social information with which to work. However, as Reicher and Haslam (2013) argue convincingly, participants (and therefore human beings) have an active role in the creation, maintenance and changing of social norms. Therefore social norms should not simply be viewed as guides for intergroup behaviour that people 'draw on', but rather phenomena which people can help shape in their *active* engagement with the social setting.

The above critiques of the minimal group paradigm suggest two things: 1) creating positive distinctiveness, while an important phenomenon, may have been overemphasized (while fairness was downplayed) and 2) Tajfel's original interest in norms was justified and that these norms may differ depending on one's social group (for example, age and gender). This perhaps means that social identity theory needs to be carefully reevaluated to consider the role of social norms and intergroup fairness.

The need to extend the social identity perspective

The proliferation of research inspired by the minimal group studies and importantly, the consequent development of the social identity tradition, is such that, according to Billig (2002), both require "careful study and reinterpretation" (p. 171).

Although the social identity perspective has been expanded from understanding ingroup bias to considering social change, as shown in earlier sections of this chapter, it still has primarily been

focused on a bipolar conception of intergroup relations. The original minimal group studies and the replications which followed 1) were conducted almost exclusively in the two-group paradigm (as we have seen, there were two exceptions to this) and 2) did not study social change directly as the methodology did not allow for it (as there were only two groups with no interaction between groups). These aspects of the original studies may have limited research and theory as they relate to patterns of intergroup alliances and solidarities which could possibly occur in more complex intergroup settings where social change is desired.

In fact, the social identity perspective often depicts people as either members of the ingroup or the outgroup (Hartstone & Augostinos, 1995, Simon & Klandermans, 2001) without considering the role of third parties in the interaction between these two groups. This is despite the fact that the nature of social identity and self-categorisation is highly complex as it operates at different levels (which will be further elaborated on below). This argument highlights the importance of studying multigroup settings and extending the social identity perspective to consider these settings. This is an area that has only recently been explored by scholars.

Social change and superordinate identification

The social identity perspective began with social change in mind (Subašić et al., 2008). However, Reicher and Haslam (2013) argue that the study and exploration of social change as a topic has been "broadly ignored by social psychologists" (p. 112). For example, they point out that in a selection of more than a dozen social psychological textbooks (a non-random selection, they admit), the topic of social change is only indexed in two. Despite this apparent lack of attention that the topic has received, any social psychological theory should account for the possibility of social change (because "change is always possible" (Reicher & Haslam, 2013, p. 112) and thus it "must be woven as a thread into the fabric of all we do" as social psychologists (p. 113).

Social change encompasses intra- and intergroup actions that mobilise actions toward alternatives to the status quo (Reicher & Haslam, 2013; Subašić et al., 2008) and often entails a struggle for power (Simon & Klandermans, 2001). In considering social change, what is equally important to challenging the status quo is the fact that social reproduction of the status quo, in order to maintain the current social hierarchy, is an active choice; not simply a default position. Therefore social change research must consider both the contestation of the status quo but also how social stability is maintained through active processes (Reicher & Haslam, 2013).

In addition to considering the interplay between social stability and social change, solidarity is arguably a necessary social structure in the facilitation of social change and also requires adequate attention from researchers. Solidarity has been described as a member's commitment to their group, and to each other, with a focus on group goals and interests which are higher order/superordinate (Subašić et al, 2008). It is only in cases where people and groups work together for a common political or social aim that change is able to occur on a large scale. Many social change movements occurring in the last few years, such as the Occupy movement, Arab spring, the Green movement (as well as online protest petitions such as those conducted by Avaaz and Watchdog) point to the significance of understanding solidarity, how it forms and how it can lead to, or at least complement, social change (Langman, 2013; Olorunnisola & Martin, 2013).

Social change arises as a result of a complex and dynamic interaction between advantaged and disadvantaged groups (Glasford & Calcagno, 2012), involving a challenge to the status quo in terms of the current intergroup power relations (Subašić et al., 2008). Tajfel (1978b, as cited in Subašić et al., 2008) argued that the highest goal for disadvantaged groups (conceptualized as social and power minorities) is to bring about social change in order to improve their position in the social structure. This is especially the case in instances where the intergroup boundaries are seen as impermeable (that is, when one cannot change one's group membership) and unstable (that is, it is possible for the intergroup hierarchy to change) as well as when the social context of the power difference is viewed as illegitimate or unfair.

One strategy for bringing about social change is through collective action (Glasford & Calcagno, 2012; Subašić et al., 2008). Collective action requires that individuals and groups act together in order to challenge the status quo through solidarity. Solidarity arises when there is a sense of collective identity and a belief that there is strength and power in numbers (Simon & Klandermans, 2001).

On one hand, a traditional theorist on group behaviour, Le Bon argued that in group situations, individuals lose their sense of identity, become anonymous and act with emotion, not rationality (as cited in Reicher, Hopkins, Levine & Rath, 2005). On the other hand, his critics argued that personal identity can in fact be retained and perhaps even enhanced in group settings (see for example, Reicher et al., 2005). What both sides shared was the view that reasoned action can only take place at the level of the individual. However, "social factors…might actually constitute the self, thus providing a social basis for the norms, values – and hence judgments – that shape collective action" (Reicher et al., 2005). This is the view of social identity theory which can be used to understand collective action and solidarity.

Recent developments in the social identity perspective: Superordinate identity and three-group models

Social identity and self-categorisation have become useful concepts in social psychology for understanding solidarity, collective action and social change. The social identity perspective has been extended by many scholars since it was first introduced to explain the findings of the original minimal group studies. These extensions have been slowly moving toward a better understanding of multigroup settings, although I will argue that more work needs to be done in this area.

This section will provide a discussion of these extensions to the social identity perspective which includes the development of the concept of a higher order, more inclusive 'superordinate identity' used to explain how solidarity arises; as well as present two modern models (Politicized Collective Identity (Simon & Klandermans, 2001) and the Political Solidarity Model (Subašić et al., 2008), inspired by the social identity perspective, which aim to more directly consider a tripolar group setting.

Multiple groups and superordinate identity

Solidarity has traditionally been defined and explored in bipolar terms. In other words, it has been concerned with focusing on ingroup solidarity against an outgroup. It describes the process whereby members of the same group form a cohesive unit, or in other words, it is the solidarity occurring among individuals belonging to the same group (an intragroup solidarity) (Glasford & Calcagno, 2012; Subašić et al., 2008). Ingroup solidarity is the form of solidarity which occurred in the original minimal group experiments. In fact, in Billig and Tajfel (1973), the term ingroup favouritism is used interchangeably with ingroup solidarity. Glasford and Calcagno (2012) argue that field of collective action has primarily focused on ingroup solidarity.

However, as Subašić et al. (2008) argue, the concept of ingroup solidarity can be extended to consider intergroup solidarity (occurring *between* distinct groups) in a similar manner. In order to understand how intergroup solidarity in a three (or more) group setting can occur, and to move away from the bipolar group paradigm prevalent in the past, the concept of the superordinate identity has been further developed from the social identity perspective. Superordinate identity is a higher order level of social identification where an ingroup and outgroup can come to view themselves as part of one large, encompassing group (Reicher et al., 2005). The extension of self-categorisation theory to consider more complex identities highlights the various layers of possible group memberships that one person can have. It also accounts for differential self-categorisation depending on the salience of that membership in a particular context (that is, a multigroup context).

According to the social identity perspective, the self is seen as "hierarchically organized, context specific and variable" (Subašić et al., 2008, p. 333). In fact, identity is a complex system (Reicher et al., 2005) in which there exist different levels of how one can relate to others. The personal or subordinate level distinguishes 'I' from 'you'; the intermediate or social level focuses on group difference, that is, distinguishes 'us' from 'them' and finally, the superordinate or human level is more inclusive (Reicher et al., 2005). Therefore a person can not only self-categorise as individuals and social members but also, at the social level, can view themselves at a superordinate stratum (more inclusive level) and a subgroup stratum (a finer, narrower division). The way to categorise oneself depends on the particular social context and saliency of group memberships in that context. Due to the complex nature of identity, a person can shift their view of her/himself from an individual (personal identity), to a member of a subgroup (exclusive social identity), and finally to superordinate group (inclusive social identity) (Reicher et al., 2005).

It is the shift in social identity, from identifying with an exclusive subgroup to a more inclusive superordinate group, which allows for identification with outgroups (which were previously defined as such at the subgroup level of perception) (Turner, 1985; Turner et al., 1987 as cited in Subašić et al., 2008). In other words, a superordinate identity allows for (a previous) outgroup to become part of the ingroup.

It is shared social identification, that is, a superordinate identity, which makes intergroup collective action possible (Reicher et al., 2005). Thus when an ingroup and an outgroup come to view themselves as one superordinate group, they may work together in solidarity to achieve a shared goal. Research has shown that sharing a social identity, in other words, belonging to the same social category, results in greater trust, respect and cooperation (Tyler & Blader, 2000 as

cited in Reicher et al., 2005) which increases the likelihood to offer help and create bonds of solidarity (Levine, Cassidy, Brazier & Reicher, 2002; Levine, Prosser, Evans & Reicher, 2005; Reicher, Cassidy, Hopkins & Levine, 2006 as cited in Reicher et al., 2005).

The way in which social identity influences solidarity and collective action can be determined by two factors, as presented by Reicher et al. (2005). The first is category boundaries, in other words, who is included in the category. This influences the extent to which mobilization and action occurs. The broader the mobilization, the more inclusive the group category needs to be. Therefore, to create solidarity, ingroup inclusion is crucial as people are more likely to help ingroup members.

Reicher et al. (2005) draws on the example of the collective rescue of Bulgarian Jews during the Holocaust to illustrate this point. Counter-mobilisations against the exportation of Jews to their death drew on notions that included the Jews in the Bulgarian national identity (that is, 'they are us'). This is very much in line with the common ingroup identity model (Gaertner & Dovidio, 2000, 2009; Gaertner et al., 1989, 1993, as cited in Dovidio et al., 2012) which posits that when separate groups are able to perceive themselves as a single group, ingroup favouritism would extend to previous outgroup members. This theory has received some empirical support (see Gaertner & Dovidio, 2000, 2009; Gaertner et al., 1989, 1990, 1999, 2000; West et al., 2009, as cited in Dovidio et al., 2012).

The second factor is the category content (or category norm), that is, what it means to be a member of the category (Reicher et al., 2005). This is what determines the direction of the mobilization, in other words, the kind of action that is taken. The action must be consistent with the identity of the group. Following the above example, Bulgarians, during the Holocaust, portrayed themselves as a humane society which was committed to religious tolerance and that in allowing the Jewish section to be removed and encamped would go against what they stood for as a group (Reicher et al., 2005).

It is argued that before solidarity and social change can arise, it is first essential that a psychological change in one's social identity must occur (Subašić et al., 2008). In other words, a person must come to identify with the group previously viewed of as 'other' (that is, the outgroup) in order for intergroup solidarity to arise, and this often occurs through the development of a superordinate identity. The social identity perspective provides the framework for understanding how this is possible.

Three-group models of superordinate identity and social change

The authors of the Politicized Collective Identity Model (Simon & Klandermans, 2001) and the Political Solidarity Model (Subašić et al., 2008) have explicitly critiqued the social identity perspective of social change for emphasizing the two-group paradigm in social psychology.

According to Subašić, Reynolds and Turner (2008):

> There is a tendency within social psychological research to understand intergroup relations in dualistic terms: in-group versus out-group, dominant versus subordinate, powerful versus powerless, disadvantaged versus privileged. In many cases, this tendency

> is useful and justified in helping us to explore and understand a complex social world. It may be problematic, however, when there is a need to understand and explain processes characterized by fluidity in people's understanding of themselves and others in the broader context of intergroup relations, and social change in intergroup relations is an example of such a process. (p. 331)

While Simon and Klandermans (2008) argue that power struggles in societal contexts:

> Are not merely bipolar conflicts between two opposing groups, but additional groups or segments of the wider society are involved as well. This calls for (at least) a triangulated or tripolar approach to power struggles. (p. 322)

These authors highlight the need for the social identity perspective to more explicitly consider multigroup settings especially in the study of social change in which intergroup alliances and solidarities are considered. The following two models presented below are important in that 1) they move away from the bipolar approach and 2) begin to provide insight into how complex social phenomena operate in the context of social change.

Politicised Collective Identity

In their model of Politicized Collective Identity, Simon and Klandermans (2001) first considered the role of third parties in power struggles for social change. Drawing on real-life examples, they argued that the contestation for power takes place in front of a wider societal audience (a third group – for example, the general public or a societal authority), beyond immediate antagonists (usually represented as two distinct groups).

This model highlights the importance of differentials or asymmetries on sociostructural dimensions that exist between groups which lead to grievances and desire for social change. Power differentials can be, but are not necessarily, related to the ability to control material rewards or punishments (for example, wealth or points in the context of the minimal group studies). Alternatively, they may be related to immaterial resources such as possession of information. It is power asymmetries which often lead to intergroup conflict. Differences in social power and status affect social identity (as discussed earlier) and this has an impact of self-esteem as well as a sense of belonging, respect, understanding and agency (Simon & Klandermans, 2001). Therefore power asymmetries may have negative consequences for the important psychological bi-products of social identity and consequently, groups will be motivated to reverse status differences – potentially resulting in conflict between groups.

The Politicized Collective Identity Model proposes that a group's social identity will become politicized, and steps toward social change will be taken, if three conditions are met. First, there is an awareness of a shared grievance in the current social hierarchy (such as illegitimate inequality, suddenly imposed grievances, violated principles and threatened privileges). Second, this shared grievance results in the ingroup blaming an external enemy (an outgroup). Third, as a result of the first two conditions, the aggrieved group seeks the support of a third party in order to receive some kind of perceived compensation from the external enemy.

According to Simon and Klandermans (2001): "Politicised collective identity thus implies a cognitive restructuring of the social environment that is no longer defined exclusively in terms of a bipolar in-group/out-group confrontation. Instead, the social environment is further differentiated into opponents and (potential) allies…" (p. 328). Attempting to enlist third parties as allies, in the process of politicizing the collective identity of a group, points to the importance of intergroup alliances and the solidarities which form when superordinate identities become salient.

Political Solidarity Model of Social Change

The model proposed by Subašić et al. (2008) also takes into account a third party in explaining collective action and social change. They argue that traditionally, research has been focused on minority (low status) groups collectively challenging an authority (high status group). However, in their model, the authors aim to explore the process that occurs when "members of the majority challenge the authority in solidarity with the minority" (p. 330), thus introducing a third group into the two group setting in a manner similar to the Politicized Collective Identity Model. In this model the three groups include: a minority (or low status group that wishes to change the social structure); an authority (powerful representatives of a high status group that oppresses the low status group) and a majority (high status group members who are represented by the authority but have the power to change their representatives and thus challenge the social hierarchy).

Like Simon and Klandermans (2001), Subašić et al. (2008) are aware of the limitations that arise by only considering a two-group paradigm and the impact that this may have on conceptions of social change and collective action. By reducing conflict to something that exists between a privileged and disadvantaged group (or the dominant and subordinate, powerful and powerless *et cetera*) limits our ability to understand the complex dynamics of social change. They argue that social change can only be achieved when the minority is able to win "the hearts and minds of the silent majority" (p. 331) who then become sympathetic toward and, most importantly, willing to act collectively with the minority against the authority to achieve desired social change. Therefore the focus is on the process by which the majority forms a superordinate identity with the minority against the authority; ultimately a "psychological change in majority self-categorisation that ultimately redefines the authority as out-group and the minority as in-group" (p. 331).

Thus social change can occur when: first, there is conflict between the minority and the authority, second, the majority becomes sympathetic toward the minority and forms bonds of solidarity with them, and finally the majority is willing to challenge the authority by acting collectively with the minority against the authority who they become to see as an outgroup. On the other hand, the status quo is maintained when the majority feels hostility toward the minority and/or is not willing to challenge the authority.

What differentiates the structure of the three-group setting in the Political Solidarity Model (the authority, majority and minority) from other possible social structures, is that the authority and majority are seen as being from the same group, at least while the social structure is stable. This shared group membership that the authority has with the majority arises from being elected as representatives of the group and thus imbues the capacity/power to influence majority. This

power over the majority only exists while the authority has legitimacy. In other words, when the authority group is questioned by the majority, the relationship between the two groups is open to change and it is possible for the authority to become the outgroup.

It could be argued that in some ways this model may therefore not be strictly tripolar due to the shared nature of group identity between the authority and majority. The authority and majority as the ingroup and the minority as the outgroup is still a somewhat bipolar conceptualization. The process of the majority splitting with the authority can be viewed as one of intragroup contestation. However, there may be multigroup settings where this preexisting shared group identity does not exist. This would include group settings where there is a clearer three (or more) group setting. For example, social structures where there are low, middle and high status groups with distinct group membership and identities. In this case, the choice of which group to form a solidarity bond (or alliance) with will not be influenced by preexisting loyalties. Therefore the Political Solidarity Model may not adequately cover the formation of intergroup solidarity (or intergroup rivalries) in this type of social structure.

The importance of context and interaction in superordinate identity and social change

One of the critiques of Tajfel's original minimal group studies was that it failed to account for the effect of interaction on intergroup relations and the formation of ingroup bias (as was discussed earlier in the chapter). This critique has been extended by Haslam and McGarty (2001) to include most experimental research to date (as cited in Reicher & Haslam, 2013). Reicher and Haslam (2013) argue that studying the social context, and the nuances of interaction in this context, are crucial to understanding collective action and social change in particular.

Research into crowd behaviour (see Drury & Reicher, 2000; Drury, Reicher & Stott, 2003; Reicher, 1996; Stott & Drury, 2000; Stott, Hutchinson & Drury; Reicher, 2011 as cited in Reicher & Haslam, 2013) for example, has shown how through interaction over time in a particular social context, social identification can change leading to mobilization toward social competition. Therefore the formation of intergroup alliances and solidarities can only really occur through interaction.

This is illustrated by examples of how people who initially support and identify with the police in a crowd setting change their identification as the police begin to treat them as the same as the rest of the crowd (Reicher & Haslam, 2013). Reicher and Haslam (2013) argue that this homogenous treatment allows confrontational crowd members to gain more influence over the 'police supporters'. As a result 'police supporters' begin to alter their perception of social identification and stop identifying with the police altogether. Consequently, the crowd becomes united, giving them power to challenge the police. This phenomenon points to the emerging and contested nature of social identity and social change which can only occur in context and through interaction, something with has not been adequately explored in social psychological research in an experimental setting.

The role of status on group identity and intergroup behaviour

Much of the research into the effect of group inequality on intergroup relations, social identity and the related sociostructural variables (such as legitimacy, stability and permeability – discussed earlier) has been in the context of a two-group setting, namely the high versus the low status group. This is exemplified by a large scale meta-analytic study by Bettencourt, Dorr, Charlton and Hume (2001) which reviewed research on social identity related differences between high and low status groups. A total of 92 studies resulting in 278 high status versus low status effect size comparisons were used. Notably absent in these studies is a middle status group. While the exploration of a high and low status group has yielded useful findings for social psychology, this two group paradigm has limited social psychology's understanding of the effect of relative status on ingroup bias, social identity and therefore, intergroup alliances and social change.

High versus low status groups

The social identity perspective posits that low status groups will experience low self-esteem related to their group membership (as it is not positively distinctive from the outgroup) and therefore seek to leave their group (if group boundaries are permeable) or improve the position of their group in order to elevate their social identity and self-esteem (Tajfel & Turner, 1979). This theory has found support in research that has shown that, compared to high status groups, low status groups tend to identify less strongly with their ingroup. In addition, they are also likely to evaluate their group less positively (Ellemers, Wilke & van Knippenberg, 1993) and either show no differential favouritism when it comes to the ingroup versus the outgroup; or in fact, show greater outgroup favouritism toward the high status group (Bettencourt et al., 2001).

However, when group boundaries are impermeable (meaning that low status groups cannot leave their group), ingroup bias will be as strong as it is for high status groups (Ellemers et al., 1993) because low status groups are more likely to engage in social competition to improve their collective status through more competitive strategies (Ellemers et al., 1993; Bettencourt et al., 2001). The literature seems fairly split on whether legitimacy (the perceived fairness of the social hierarchy) or stability (whether the social structure is open to change) will enhance ingroup bias (Bettencourt et al., 2001) or have no effect on ingroup bias (Ellemers et al., 1993). However, a sense that the social hierarchy is illegitimate seems to result in higher ingroup identity for the low status group (Ellemers et al., 1993).

As has been discussed previously in this thesis, the social identity perspective of social change argues that a primary goal (especially) for low status, or disadvantaged groups, is to improve their social identity in order to achieve a higher level of self-esteem – a basic social psychological need (Tajfel & Turner, 1979; Subašić et al., 2008). As we have seen, one possibility for the low status group to improve their sense of identity as a group is to engage in social change strategies, specifically social competition with a high status group in order to topple the illegitimate social hierarchy (Tajfel & Turner, 1979). Social competition requires cooperation among group members – a sense of solidarity with one another – in order for collective action to be possible.

However, in a multigroup setting, solidarity can take on two forms – either ingroup solidarity *or* intergroup solidarity with a group of a similar or different status. The Politicised Collective Identity Model, discussed earlier, argues that low status groups have more reason to politicize than other status groups due to their relative disadvantage in the unequal social hierarchy. Furthermore, this politicization involves attempting to recruit a third group to their cause (Simon & Klandermans, 2001); which is a view supported by the Political Solidarity Model (Subašić et al., 2008). Therefore, it would seem that low status groups are in such a position that they are more likely than other status groups to form an alliance with one or more other groups in order to improve their position in the social hierarchy and furthermore this alliance is aimed at competing with the high status group.

While low status groups (when they perceive the social hierarchy to be illegitimate) will either show increased ingroup bias, or try to form an alliance against the high status group (in order to create social change), high status groups will mobilize against a low status group when there is a shared "awareness that their status and the associated privileges are threatened" (Simon & Klandermans, 2008; p.326-327). This occurs particularly when the social hierarchy is viewed as unstable, meaning that it is open to change. The high status group will develop feelings of insecurity about their advantaged position. This leads to them acting in discriminatory ways, including showing greater ingroup bias (Bettencourt et al., 2001).

The impact of legitimacy is also important in this context. High status groups generally have a tendency to view the social hierarchy (and thus their superior position) as legitimate and fair (Bettencourt et al., 2001). These legitimizing beliefs support the status quo thus serving their best interests in terms of maintaining a high status thereby securing a positive social identity and high self-esteem (Tajfel & Turner, 1979).

Due to an unwillingness to change the status quo, it would appear that high status groups may have less motivation to form intergroup alliances than low status groups. However, recent research on the effect of positive intergroup contact between high status and low status groups shows that an alliance between them can actually serve to maintain the status quo (Saguy & Chernyak-Hai, 2012; Dixon, Durrheim & Tredoux, 2010). Therefore, even though it may appear as though a high status group would have less to gain from an alliance than a low status group, they may actually be the ones who benefit from these alliances. Maintaining the status quo through positive intergroup contact (or intergroup alliances) may help to ensure that their high status position is secured. This notion will be explored in greater detail in the following sections.

When solidarity and positive intergroup contact prevents social change

Dovidio, Saguy, Gaertner and Thomas (2012) argue that collective action requires two key elements. Firstly, that there is a perception of status difference between social groups which is viewed as illegitimate and, secondly, the salient (relevant) group identity is taken up by individuals. Positive intergroup relations – in the form of superordinate identification and positive experiences of intergroup contact – cannot ensure that these two elements of collective action will arise. Furthermore, as argued in further detail below, positive intergroup relations may even prevent collective action and, therefore, social change.

Superordinate identification may reduce collective action

Much of the solidarity literature argues that superordinate, more inclusive groups make intergroup solidarity and collective action possible (that is, superordinate identity is the salient identity for social change to occur). However superordinate identity may actually result in inaction as unjust social differences may be maintained (Saguy, Tausch, Dovidio & Pratto, 2009; Wright & Lubensky, 2008; Dixon, et al., 2010 as cited in Glasford & Calcagno, 2012). When disadvantaged groups see themselves as a part of a superordinate group they "adopt a one-group perspective at the expense of their previous group identity" (p. 252) and are less likely to notice inequality or may even see these differences as legitimate. Furthermore, greater fairness from advantaged group members is expected (Dovidio et al., 2012) which is found to be related to lack of collective action (Saguy et al., 2011; as cited in Dovidio et al., 2012). Consequently, these perceptions could undermine the low status group's motivation to challenge the status quo thus maintaining the social structure which reproduces these inequalities (Dovidio et al., 2012). In other words, superordinate identification might help to improve interpersonal subjective interactions may while doing nothing to shift the existing social structures of inequality (or even entrenching them further) (Dovidio et al., 2012).

Positive intergroup contact and harmony may reduce collective action

Traditionally, it was thought that in order for social change to occur intergroup harmony and prejudice reduction was necessary (Wright & Baray, 2012). However, this argument has been called into question more recently. Wright and Baray (2012) explain that this outdated view was a consequence of a lack of collaboration and communication between prejudice literature, on one hand, and collective action and social change literature, on the other hand. In the past, prejudice has been viewed as the center of social inequality, however, it has been found that inequality can exist even with positive characterizations of the outgroup (Wright & Baray, 2012). Thus subjectively pleasant interpersonal interactions with other group members may serve to "legitimize and stabilize the hierarchical intergroup structure" (Wright & Baray, 2012, p. 238) especially as experiences of positive contact (like superordinate identification) can result in an expectation of fairness from high status groups toward groups of low status (Saguy & Chernyak-Hai, 2012).

The above pattern can be understood through a variety of social psychological theories including shared reality theory (e.g. Hardin & Higgins, 1996 as cited in Wright & Baray, 2012) and social tuning (e.g. Sinclair, 2005 as cited in Wright & Baray, 2012). The former theory posits that self-stereotyping will occur in social interactions in order to create a common understanding – as cultural stereotypes are shared – especially in an effort to form and maintain social bonds. The latter, related theory, argues that people will adjust, or 'tune', their understanding of themselves and their reality in order to maintain a sense of shared reality in the quest for affiliative bonds. Therefore these processes only serve to "strengthen the existing, culturally shared status inequalities" (Wright & Baray, 2012, p. 240).

Common ingroup (superordinate) identity versus dual identities

One way to overcome the problem of positive intergroup contact and common superordinate identity is the promotion of dual identities instead of a one-group identity. In other words,

members of a more inclusive superordinate group can simultaneously retain their previous identity thus resulting in a "subgroups-within-a-common-group" (p. 251) scenario. This serves to draw attention to group disparities, motivating disadvantaged groups, while at the same time create a 'moral inclusion' (through the common group identity) which will motivate advantaged groups toward collective action for social justice and equality (Dovidio et al., 2012).

However, maintaining dual identities is not without its problems due to the way that these identities operate differently depending on the status of the group. For example, advantaged groups prefer a common identity to be emphasized, as one-group representations maintain the status quo. A study by Saguy et al., 2009 (as cited in Dovidio et al., 2012) found that advantaged groups tend to have intergroup harmony as a goal rather than creating equality between the groups. While advantaged group members may have positive feelings toward, as well as help, individuals who were originally considered an outgroup member, they are unlikely to extend this to the group in general. This facilitates individual mobility while maintaining structural inequalities (Dovidio et al., 2012). Therefore attitudes may change but the unjust hierarchy remains. Furthermore, advantaged group members may respond negatively to disadvantaged group members who express a dual identity (Dovidio et al., 2010; Kaiser & Pratt-Hyatt, 2009 as cited in Dovidio *et al*., 2012), although this effect is reduced when advantaged group members learn to view dual identities as beneficial (Scheepers et al., 2010 as cited in Dovidio et al., 2012).

Intergroup alliances and rivalries in the process of social change

Collective action theorists argue that social justice and social cohesion are not necessarily entwined and in fact often times "conflict is essential" (p. 227) to create equality across groups. This view is in line with Tajfel and Turner's (1979 as cited in Wright & Baray, 2012) description of collective action as social competition which implies that conflict between different status groups is sometimes necessary and beneficial (in social identity terms). Wright and Baray (2012) argue that, intergroup harmony in itself, is not the solution to social inequality but rather they propose that there needs to be "a balance of harmony and conflict, segregation and contact, and antipathy and positive regard" (pp. 226) as intergroup harmony alone often serves to maintain social inequality.

Adding a middle status group

Much of the research done on social identity and ingroup bias in social hierarchies has focused primarily on high and low status groups (see Bettencourt et al, 2001). A middle status, or 'middle class', group has been excluded from these studies. Research which has looked at the middle class has focused primarily on historical accounts (see for example: Swenson, 1991; Fernandes & Heller, 2006; Suh, 2002). As such, it appears that a middle status group has been largely neglected in experimental social psychology.

Although there are studies which have explored status as it relates to social identity and alliance formation, a middle class is not apparent in these designs or results, thus limiting the theory developed that arises from these studies. In addition, not much research has been done on the cross-class alliances or intergroup solidarity of the middle class, a motivating factor for the creation of the Middle Class Poverty Politics Research Group (see Lawson, 2012) which argues

that there has been under-theorising in the field of poverty politics regarding the possible role of the middle class in the production and maintenance of social inequality.

It is nearly impossible to fully explore the pattern of intergroup alliance formation of low and high status groups in a two group paradigm. Adding a third group, especially a group 'caught in the middle', can further research into collective action by looking at whether the low or high status group has a greater tendency to form an alliance with the middle status group and how this middle status group is likely to respond. Studying the middle status group will enable researchers to see whether this group will: 1) attempt to create social change by aiding the low status group (and possibly threatening their own relatively privileged position); 2) form an alliance to create social mobility by 'reaching' to the high status group (at the expense of the low status group); or 3) some combination of both.

Middle status as the silent majority?

One could imagine the middle status group in terms of the 'silent majority' or 'societal audience' in the Politicized Collective Identity Model (Simon & Klandermans, 2001) and the Political Solidarity Model (Subašić et al., 2008). In this three group setting, the low status group has the most motivation for social change while the high status group, or authority, has the least motivation as they have the most social power, including power over the majority. Therefore it is possible to see the majority as being middle status as they do not have the power of the authority (but rather the authority has power to influence them) but they are also not in a position of disadvantage in the same way that the low status, or minority, group is. If we conceptualise the middle status group according to the above framework, which group (high or low) the middle group will form an alliance or solidarity with depends on the perceived legitimacy of the high status group and the social hierarchy more generally (Subašić et al., 2008).

However, there are some differences between the conception of a middle class and a majority group. First, in the above models, the majority is seen as sharing an identity (and thus being a part of) the authority group, at least in the beginning of contestation for power. This is not necessarily the case in all middle status groups where there may be a stark boundary between the high and middle status group. Second, there are size differences among the groups in these models which, if applying them to distinct status groups, may vary depending on the context. The model assumes that: the minority, as the name suggests, will have fewer members; the authority will also have limited numbers but greater power; and the majority is the largest group. However, this does not account for instances where the low, middle and high status groups are roughly equal or where the low status group actually has more members than the middle class (conceptualized as the majority). Therefore if applied to three group settings, other than the minority, majority and authority; these models may benefit from some additional flexibility.

The 'fear of falling'

Lawson (2012) argues that generally it has been found that the middle class plays a role in "consolidating hegemonic political discourses of market reform and social improvement" (p. 2) which serves to consolidate existing social class inequalities and thus secures their position in the current social hierarchy. This is something that could possibly play out in an experimental setting

(or another setting which may not relate directly to wealth and class) but this has not been explored from what is apparent in the literature.

In terms of the existing research on the middle class, "middle class defensive strategies" (Lawson, 2012, p. 10) have become a topic of study. These strategies are defined as directed social actions which aim to create distinctions with the poor in order to retain control over resources, both political and economic (Lawson, 2012). Bourdieu & Passeron (as cited in Lawson, 2012) argue that these distinctions reproduce class inequality and the privilege of middle (and elite classes) and work to either *exclude* or recruit individuals from other classes. Social distancing and class boundary creation can take place through both discourse and behaviour. Lawson (2012) argues that the middle class often employs ways of talking about the poor that frames them as undeserving or fundamentally flawed. The construction of the poor in the preceding examples aims to account for, and legitimize, status differences. In addition, behaviour such as setting up and 'defending' gated communities from the infiltration of the poor can also be considered a defensive strategy because physical boundaries between the middle and lower classes are established (Roy, 2012). These defensive strategies serve to maintain a social hierarchy in which middle classes are less likely to drop in status while also retaining the possibility of advancing their social position through individual mobility.

Creating distinctions between classes in order to maintain the social order may be linked to a fear of falling from a higher status group to a low status group. This is linked to notions of permeability (Tajfel & Turner, 1979) where individuals can cross group boundaries, in other words the idea that group membership is not necessarily permanent. In reality, group boundaries between the middle class and the poor are such that it is possible for a middle class individual to drop in status and lose their membership to the middle class. This may result in a need to maintain their relatively comfortable position by maintaining the status quo and not acting in solidarity with low status groups to bring about social change. This fear of dropping into the lower classes has shown to be a real concern to higher status groups. For example, it has been found that in many countries wealth is shifting from the middle to the upper classes and instead of upward social mobility; the middle class appears to be declining (New York Times, 2002; Pressman, 2007 in Lawson, 2012; Literell, Brooks, Ivery & Ohmer, 2010).

In India, middle class political activism is said to "remake Indian cities in ways that exclude marginal groups, reproduce classed and propertied interests, and support capital accumulation" (Ellis, 2011, p. 71) and furthermore that it reflects a "need to patrol the imagined and material boundaries of class privilege" (Ellis, 2011, p. 73). Roy (2012) points to the fact that the middle classes often do not act in solidarity with the poor, but rather act in solidarity (that is, ingroup solidarity) *against* them. For example, the Indian middle class has played a crucial role in the violent evictions of the poor in urban areas in order to 'clean up the city' and develop their identity as, what she terms, 'consumer-citizens' (p. 26). Fernandes and Heller (2006) provide further support for the notion of social distancing from the lower classes which occurs in Indian society as well as highlight the role the middle class plays in the "politics of hegemony" (p. 495). This lends support to the notion that the middle class can be self-interested and unlikely to help the lower classes.

However, this does not mean that there are not instances in which the middle class (or at least a subgroup thereof) lend support to lower status groups. For example, Adamovsky (2009 as cited in Lawson, 2012) found that in Argentina, a subgroup within the middle class were building solidarity ties with the poor despite a past where the exact opposite was true. This change can be attributed to the growth of 'new poor', who still identified as middle class despite objectively not belonging to said group any longer (because of changes in wealth). Therefore the 'new poor' see themselves as closer to the lower classes than ever before (despite maintaining a middle class identity) and, as a result, question previous assumptions of lower classes as lazy and immoral and therefore deserving of their disadvantaged position in society.

Ingroup bias versus intergroup solidarity

As the above evidence suggests, the middle classes more often than not do not side with lower status groups to challenge inequality, especially if it may threaten their own position in the current social order. When collective action is taken by the middle class, this appears to reflect ingroup solidarity rather than intergroup solidarity with a low status groups. In other words, the middle class are likely to engage in collective action *with the ingroup* where group self-interest is concerned. Maavak (2010) argues that social movements such as Arab Spring and Occupy Wall Street were the result of a global anger and hopelessness felt by the middle classes arising from the growing economic disparity between the middle and upper classes as well as the "disillusionment with meritocracy" (p. 12), where hard work and education do not necessarily result in progress.

Inequality and corruption appear to be tolerated by the middle class as long as it is "not-in-my-backyard" (NIMBY) and does not directly affect their livelihood (Maavak, 2010). Furthermore, it appears that it is the growing gap between the middle and upper classes that tends to ignite discontent and collective action (The DCDC Global Strategic Trends Programme, 2007 as cited in Maavak, 2010). This seems to indicate that the middle class show a tendency to maintain the status quo unless some growing social inequality directly begins to affect their individual and group interests.

In the literature, there does not appear to be a theoretical model for understanding under which conditions the middle class (or middle status group) will form solidarity ties and with which outgroup this will likely be. The possibility exists that members of this middle status group either show ingroup solidarity, outgroup solidarity with the high status group or outgroup solidarity with the low status group. Literature on the middle class suggests there are varying instances in which the middle class acts in solidarity with the poor, but more often than not they use their position in the social hierarchy to maintain the status quo and act in self-interested ways. By studying the middle class in an experimental setting one may be able to develop some initial ideas about what intergroup alliances may occur.

The potential "bridging" role of a third group

As has been established in previous sections, the three-group paradigm allows for one to study whether ingroup bias will dominate even in conditions where there is not a stark 'us versus them' dichotomy which may enhance intergroup competition. Furthermore, intergroup alliances between two groups to the exclusion of a third can be studied under this paradigm. Finally, one

can study a middle status group which has not received much attention in the existing literature. However, adding a third group to the traditional two-group paradigm also allows one to consider a potential "bridging" role that this third group may play in connecting two groups.

Bridging is a term commonly used in the study of social networks, especially in the field of sociology. It describes individuals who occupy a position between two distinct and otherwise unconnected individuals (Burt, 2000; Kalish, 2008). Social network research does not often only study dyads; rather network phenomena are concerned primarily with triads – three people with ties between them (Kalish, 2008). This enables more complex processes to be studied as "processes that occur in triads are qualitatively different to those that occur in dyads" (Kalish, 2008, p. 53). This argument can be extended from the study of individuals to the context of groups where the addition of a third group allows for more complex social phenomena to be studied – for example intergroup alliances between two groups to the exclusion of a third group, as discussed previously. Besides intergroup alliances, a possible bridging role of a third group can also be studied.

To get a better understanding of the concept of bridging, the notion of structural holes requires some explanation. A structural hole occurs between two groups when they are not connected but rather, are isolated from each other. In other words a gap exists where there is no existing relationship or flow of social capital (such as information or even wealth) (Burt, 2000). This provides a unique opportunity for individuals or groups to occupy this gap created by forming ties with both sides (Burt, 2008). Acting as a bridge usually has social advantages because those individuals and groups who are "better connected…enjoy higher returns" (Burt, 2000, p. 348). In other words, better connected individuals have greater control of the social situation and greater access to social capital (for example, information) from both sides (Burt, 2000; Kalish, 2008).

Occupying a connecting position between two groups allows for three unique opportunities. First, one may be a mediator, bringing together two groups by enhancing relations between these groups (Burts, 2000; Kalish, 2008). Second it allows one to act as 'tertius gaudens' – a third person who benefits (Burt, 2000; Kalish, 2008) - by "seeking to turn disagreement between the other two to his (or her) own advantage" (Kalish, 2008, p. 54). Finally, it allows for a divide-and-conquer approach which is when the third person/group *intentionally* creates tension and competition between the other two groups in order to gain dominance.

These three opportunities are motivated by two distinct drives. Kalish (2008) describes these as relationship-building and entrepreneurial motives. The former is relates to the first opportunity described above, that is, acting as 'the non-partisan and the mediator' (Simmel, 1995, as cited in Kalish, 2008). This motive is driven by the desire to build and maintain the unity of the triad for collective gain. The latter motivation is more egocentric and relates to both the 'tertius gaudens' as well as the divide-and-conquer approach. This entrepreneurial motivation is concerned with enhancing personal gain and accruing social power at the expense of unity in the triad.

Therefore including a third group allows one to study the potential bridging role that this group may have in connecting the other two groups. Therefore extending the two-group paradigm is beneficial to the minimal group design, and social psychology more generally, in the same way

that studying triads has been beneficial to understanding complex social phenomena in social networks.

Chapter 3: Aims and Rationale

As I have argued in Chapter 1, social psychological research has primarily employed a two-group paradigm to study and understand intergroup behaviour. This argument applies to the minimal group studies, the seminal set of experiments in social psychology which led to the development of the social identity perspective (Tajfel & Turner, 1979). However, multigroup settings are possibly even more common than two-group situations and therefore extending research to consider how these settings may differ from dichotomous intergroup contexts is necessary. Including a third group to the two-group paradigm also enables the study of a middle status group which has received scant attention in the past. In addition, a three-group setting allows for the study of intergroup alliances and solidarities (which is not possible in the two-group paradigm and was not explored in the original minimal group studies). Finally, the role of interaction in the development of behavioural norms (such as ingroup bias and alliance) has not been adequately accounted for in traditional experimental designs. Thus the agency of participants (and therefore human beings) in the formation of norms is ignored.

In light of the above argument, the primary goal of this research was to extend the minimal group paradigm to overcome the two primary critiques of social psychological experimental research in order to address new avenues of research. There are three aims to extending the minimal group paradigm in this way. First, this research was concerned with studying how a third group may impact on the development of behavioural norms (which may be different to a two-group setting). Of particular interest is the role of a middle status group (about which there is currently very little research) in terms of: a) if and how this addition to the high versus low status group dichotomy may affect the development of group norms (for example, ingroup bias) and psychological experiences for the high and low status group and b) what behavioural norms develop within the middle status group. The second aim of the research was to study the minimal conditions under which intergroup alliance (and possibly solidarity) may develop. This in some sense mirrors the original minimal group studies which aimed to discover the minimal conditions under which discrimination against an outgroup would occur. However, as we have seen, these studies could not study intergroup alliances as they employed the two-group paradigm. The third and final aim of this study was to determine if and how behavioural norms (such as ingroup bias and intergroup alliances) change and develop over time by allowing interaction to occur among participants.

Research questions and hypotheses

The following questions were developed in order to help address the general aims of the research. Due to the limited literature on the middle status group, and the three-group setting in general, some of the expectations presented below were based on related (rather than direct) research on ingroup bias and the social identity perspective conducted in a two-group paradigm. Due to the novel nature of the experimental method and the use of the three-group paradigm (which has not received much attention in the existing literature) this research was rather exploratory in nature.

1. Are groups more likely to show ingroup bias or intergroup alliance in the three-group setting?

Table 1. Expectations according to group status

	Group status			
	Equal	High	Middle	Low
Ingroup bias versus intergroup alliance	Ingroup bias	Ingroup bias	Ingroup bias	Ingroup bias and intergroup alliance with low/middle status group against high status group

All groups were predicted to show some ingroup bias because, overall, this has been reported to be a strong trend in the original minimal group studies (Tajfel et al., 1971) and in most replications thereof (Doise et al., 1972; Doise & Sinclair, in press; Tajfel & Billig, in press; Turner, 1972; as cited in Billig & Tajfel, 1973). Furthermore, the present study only allowed ingroup and outgroup allocation (not the complex strategies afforded by Tajfel's matrices).

Furthermore, with regards to equal status groups, since the original studies did not manipulate status (therefore both groups were of equal status) and because these equal status groups showed ingroup bias (Tajfel et al., 1971), ingroup bias was also predicted for equal status groups in the present experiment. Next, the literature predicts that high status groups will show high ingroup bias in order to maintain their social advantage (Ellemers et al., 1993) therefore this was also expected in the present study. In addition, the low status group was also predicted to show ingroup bias as group boundaries were impermeable in the present study, and research has shown that in instances where social mobility is not possible the low status group will also show high ingroup bias (Ellemers et al., 1993). However, the literature also suggests the low status groups are more likely to form alliances against the high status group (Simon & Klandermans, 2001) and therefore both ingroup bias and intergroup alliance was predicted for the low status group. Finally, as the middle status group is seen as self-interested (Maavak, 2010), ingroup bias was also predicted for this group.

2. Does interaction lead behavioural norms (intergroup bias and intergroup alliance) to increase or decrease over time?

Table 2. Expectations of increase or decrease in behavioural norms according to group status

	Group status			
	Equal	High	Middle	Low
Increase or decrease in ingroup bias or intergroup alliance	Ingroup bias increases	Ingroup bias increases	Ingroup bias increases	Ingroup bias decreases while intergroup alliance increases

Since ingroup bias in the minimal group paradigm has not been studied with interaction using a three-group paradigm, the expectations that ingroup bias would increase for most of the groups

was based on the prediction that this trend would gain momentum through interaction as social actors are active engaging in the formation of norms (Reicher & Haslam, 2013) and that ingroup bias would be strong (predicted above) and so would more likely increase than decrease over time. However, because Simon and Klandermans (2001) argue that low status groups have a greater motivation for alliance formation against a high status group, it was expected that (although present) ingroup bias may decrease for low status groups as a result of increasing intergroup alliance (based on the desire to challenge the status quo).

3. How do the three groups experience the intergroup setting in terms of identity (ingroup identification, superordinate identity) and sociostructural variables (legitimacy, stability)?

Table 3. Expectations regarding psychological experience (ingroup identification, superordinate identity, legitimacy and stability) according to group status

	Group status			
	Equal	High	Middle	Low
Ingroup identity	High	High	High	High
Superordinate identity	Low	Low	Low	High
Legitimacy	High	High	Average	Low
Stability	Low	Low	Low	Low

High ingroup identification was expected for all status groups but for different reasons based on the literature regarding ingroup identity and differential group status. First, with regards to equal status groups, group members were not expected to suffer from low self-esteem related to their social identity as there were no upward-comparison (or higher status) groups in the hierarchy. Therefore, they would have no reason to shift their identity away from their group to preserve their self-esteem. Instead, as a result of self-categorisation and desire to create positive distinctiveness, equal status groups were expected to identify with their ingroup (Tajfel et al., 1979). High status groups were expected to have high ingroup identification due to their existing positive distinctiveness compared to the outgroups of lower status, in line with what has already been found in the existing literature (Ellemers et al., 1993). Low status groups were also expected to have high ingroup identification but because group boundaries in the current experiment were impermeable and therefore the option for social mobility (and therefore a motivation for low ingroup identity) was not available (Ellemers et al., 1993). Lastly, middle status groups were positively distinct from the low status group therefore it seemed likely that because of social creativity (Tajfel & Turner, 1979) they would be able to make a downward comparison to help bolster their self-esteem and ingroup identity.

On one hand, superordinate identity was expected to be lower for the equal, high and middle status groups than low status groups due to high ingroup identity and lack of predicted alliances. In other words there was no strong motivation for intergroup alliances (to create social change) for these groups. On the other hand low status groups were predicted to have higher superordinate identity as a result of based on the prediction that that they would be more likely to form an alliance with another low status group against the high status group (Simon & Klandermans, 2001).

In terms of perceived legitimacy, due to no initial differences in token balances, it was predicted that equal status groups would have no reason to see their group status as illegitimate. High

legitimacy was predicted for the high status group as the literature indicates that high status groups are more likely to see the social hierarchy as legitimate as it is to their relative advantage (Bettencourt et al., 2001). On the other hand, for low status groups, it was expected that legitimacy would be lower since it disadvantages them and threatens their self-esteem (Bettencourt et al., 2001). Finally, there was no clear expectation for middle status groups since although they were better off than low status groups they were worse off than high status groups. Therefore a sense of legitimacy or indeed illegitimacy was not expected to be as strong as it would possibly be for the other groups.

Lastly, regarding status stability, because interaction occurred over time and it was therefore possible for social change to occur, it was predicted that perceptions of status instability would be similar for all groups.

Again, it should be emphasized that due to the unique nature of the present experiments, solid predictions were not possible. Therefore the predictions reported above were rough estimations based on inference from literature which has focused on a two-group setting without interaction.

Chapter 4: Methodology

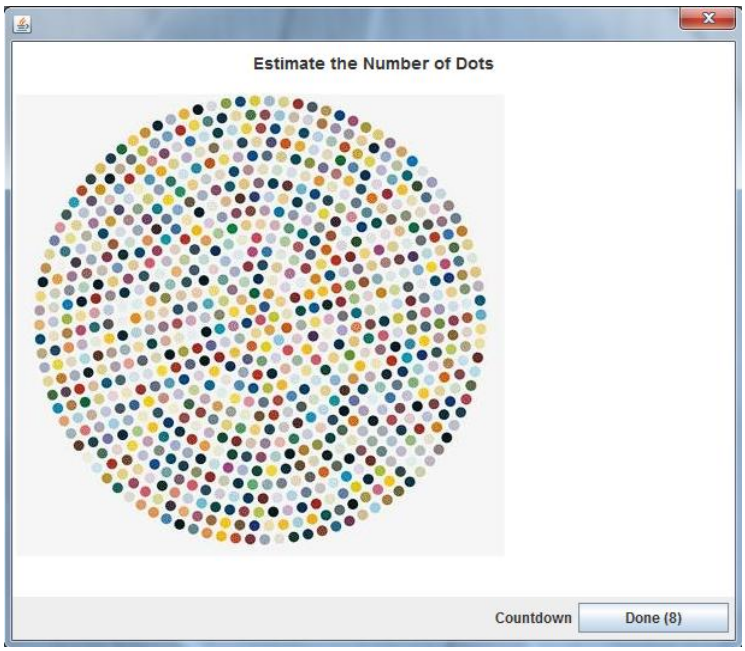
This research was conducted using a three-group paradigm in order to study phenomena such as intergroup alliance and the behavioural patterns of a middle status group, as well as to test the ability of the findings of the original studies (that is, high ingroup bias) to be extended to a three-group setting. In order to do meet these aims, three different social hierarchies which manipulated group status were compared. The three status hierarchies were the: equality, flat inequality and ranked inequality hierarchy. The details of how the features of these hierarchies were manipulated will be discussed following the description of the VIAPPL platform.

The Virtual Interaction Application (VIAPPL) Platform

The present study was conducted using VIAPPL (Virtual Interaction Application) (Durrheim & Quayle, 2012), a laboratory based software platform which allows interaction to occur among participants in a virtual environment and appears to participants in a game-like format. VIAPPL was developed, among other things, to replicate and extend the minimal group studies and therefore study a variety of possible group norms which may arise in interaction

At the beginning of the game, participants are randomly divided into three groups of an equal number of players (six players per group), although to their knowledge they are divided according to their performance on a dot estimation task, see Figure 6. This division of groups is based on the classic minimal group studies (see Tajfel et al., 1971), where groups are constituted randomly in order to eliminate the possibility that there is a some common characteristic related to their actual performance on the task that could account for group differences in interaction. The random assignment into groups eliminates this possibility but at the same time allows for intergroup relations to arise as group membership becomes salient.

Figure 6. Random assignment procedure: Dot estimation task



Participants were presented with a screen of dots in Figure 6. A timer of 10 seconds was programmed in order to ensure that time was not wasted on this bogus task. Participants were instructed to press the 'Done' button if they were ready to make their estimation before the timer ran out. In a screen which followed the one in Figure 6 they were prompted to type in their dot estimation. A third screen followed the estimation input screen – this screen informed participants that they were divided into a group with participants who had made guesses similar to their own.

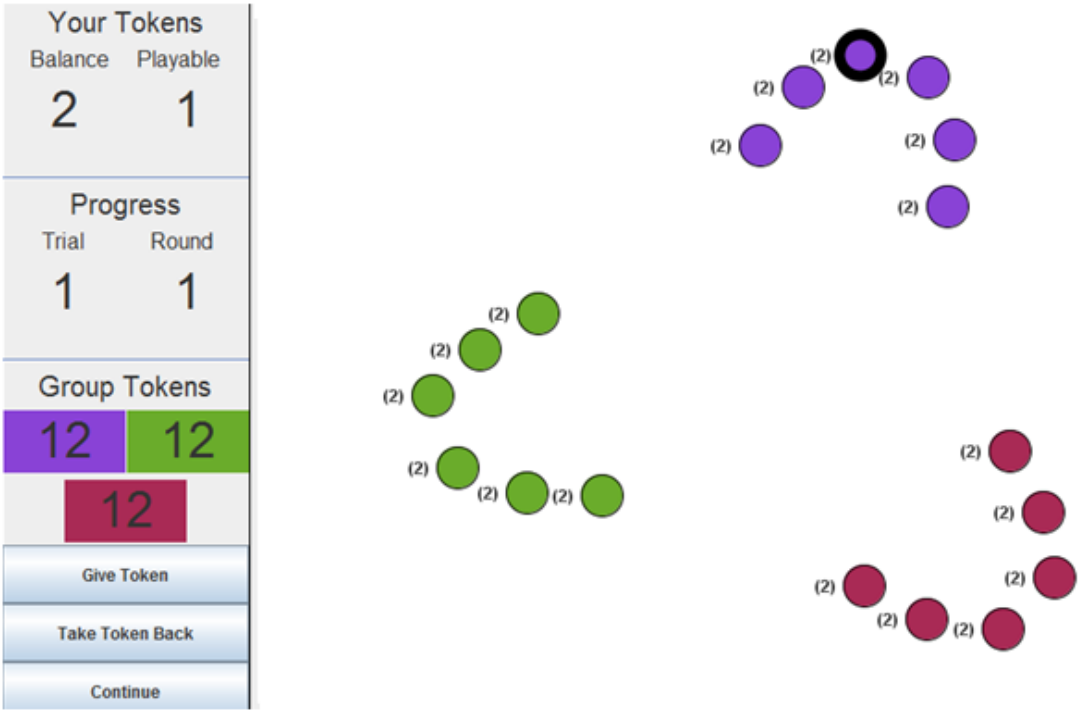
The concept of 'minimal groups' introduced by Tajfel was maintained in the present research using VIAPPL. In other words, participants are unaware of the real identity of ingroup and outgroup members, thus removing any social and group category indicators – such as group history and meaningful attributes of a group – which participants may ordinarily draw upon in an intergroup setting. Presenting the intergroup environment to participants in this way enabled the study of the minimal conditions in which social phenomena such as solidarity and alliance formation could occur. This approach closely mirrors Tajfel et al.'s (1971) rationale for studying intergroup phenomena in a controlled setting in order to discover the minimal conditions for ingroup bias to emerge.

The experimental game is interactive in nature, consisting of a series of rounds (2 practice rounds and 40 actual rounds). The practice rounds enabled participants to become familiar with the VIAPPL environment. This ensured that the game (which produced the data used in the analysis) would proceed smoothly and that lack of familiarity would not interfere with the participants' patterns of token allocations. In other words, the practice rounds helped ensure that participants would not become frustrated or confused in ways which would yield data that was not based purely on the intergroup setting.

During each round each participant was able to allocate one token to any other player in the game regardless of group membership, the only limitation being that participants are not able to self-allocate tokens as this was hypothesized to become an overwhelming norm which would make the study of intergroup alliances difficult. This hypothesis was based on previous VIAPPL studies which found self-giving to be a strong emergent norm (Durrheim, Quayle, Titlestad & Tooke, unpublished manuscript).

The game environment, or arena, was a simple one (see Figure 7) where players were represented as dots on the screen. They were divided into one of three groups, and groups were made salient to the players in two ways: through colour coding (each group was a different colour) and the group's position on the screen (depending on the status of the group). The latter aspect of the arena design was such that the lower status groups were at the bottom of a triangular hierarchy while the high status group was positioned at the top. For the equality condition, the same arena was used even there was no high/low division to reflect the visual hierarchy. However, it was predicted that the group position would only emphasise the different status of the groups. Therefore, without initial token differences, the groups' virtual position would not likely influence to which groups participants allocated.

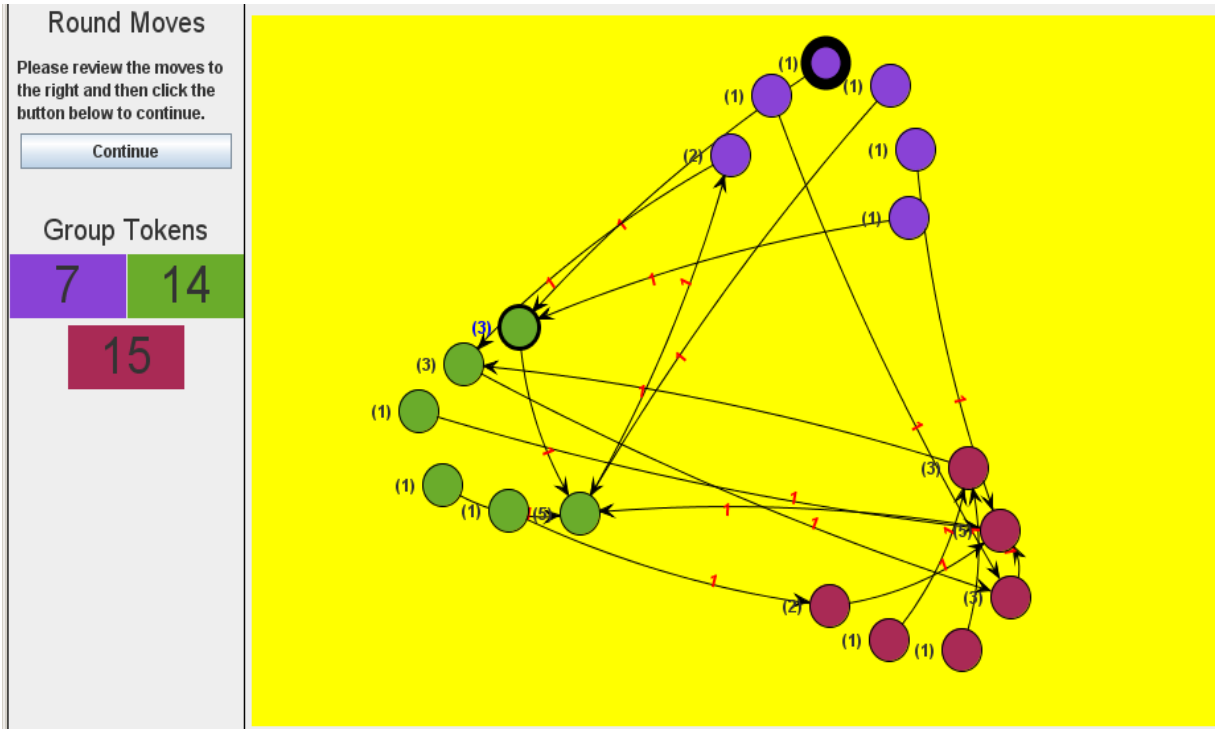
Figure 7. VIAPPL arena



In Figure 7, one can see that the dot (avatar) with a bold outline represents the individual player, and this was how the participants were able to locate themselves onscreen. Next to each avatar there was a numeric value in brackets which represents the token balance of each individual player while on the left hand side of the screen, the group balances are visible. This left hand panel also indicates to players the number of rounds that they have completed.

At the end of each round players were able to see the pattern of token exchange in a "round moves" image which appears on their screen before they continue to the next round (see Figure 8). This image showed the ties between players through arrowed lines indicating the tie exchange and the direction of the tie. Therefore players were able to see which players (if any) gave to them in the previous round, as well as see the token exchanges between every other combination of players as well as some general idea about how the groups were interacting. These aspects of the VIAPPL setting enabled players to see the group inequality (through group token balances) and patterns of token exchange (used to gain an idea of general intergroup interaction) which was then predicted to influence to whom they will give in the subsequent round.

Figure 8. Round moves image



Integration with Limesurvey

This study aimed to address intergroup behaviour and psychological experience in a three-group setting with interaction. First, it measured the behavioural aspect in the form of token exchanges in the VIAPPL environment as has already been described in detail. Second, the study measured psychological aspects of the intergroup setting in terms of identity formation (ingroup and superordinate) and as perceptions of legitimacy, stability, conflict and perceived alliance.

These psychometric aspects of the design were measured before and after the game using pre and post experimental questionnaires. To do this, VIAPPL had been integrated with Limesurvey – an online survey tool in which questionnaires online and can be set up, administered and stored online. The details of the questionnaire used to conduct this aspect of the research will be described in the following sections.

Research design

The present study was a quantitative within-subjects and between-groups experimental research design. The within subjects factor was time where participants' behaviours (in the form of token allocations) are recorded over a series of 40 rounds. This allowed one to see whether behaviours, such as ingroup bias and intergroup alliance, increased or decreased over time.

The between-groups factor, and independent variable, was the status condition. There were three conditions: an equality condition where all groups are of equal status (the control condition); a flat inequality condition with two low status groups and a ranked inequality condition, which introduced a middle status group to the minimal group paradigm, something which has not been explored previously.

Therefore status had three levels manipulated by the VIAPPL environment:

1. Equality: All three groups commenced the experiment with equal token balances – 20 tokens per participant.
2. Flat inequality: This condition had two low status groups and one high status group at the beginning of the experiment. The two low status groups began the experiment with 15 tokens per player each while the high status group started with 30 tokens each.
3. Ranked inequality: This condition consisted of one low status, one middle status and one high status group. The low status group began the game with only 10 tokens per player; the middle group had 30 tokens per player while the high status group had 40 tokens per player.

In summary, the research project consisted of three conditions, each beginning with one of three above described status hierarchies. Furthermore, each condition was replicated 3 times in order to yield sufficient statistical power for the analysis. The design is illustrated in Table 4. There were a total of 9 experiments, each with a different set of 18 participants (162 participants in total).

Table 4. Research design: Studies and replications

Independent variable		Replications
Status	Equality	3
	Flat inequality	3
	Ranked inequality	3

At each round VIAPPL recorded each participant's token allocation by which group they gave to. The possible actions were: Tokens to Ingroup; Tokens to Group A, Tokens to Group B, Tokens to Group C. For example, if in round 1, participant 1 gave a token to a participant belonging to Group B, then a 1 would be recorded in this column and 0's recorded in all the other columns (Tokens to Ingroup, A, C).

It should be noted that the Group A, B and C was related to a particular status group depending on the condition of the study. For example, in the equality condition, Groups A, B and C did not have different status. In the flat inequality condition, Tokens to Group A represented tokens to

the high status group; while Tokens to Group B and Group C were the two low status groups. Finally, in the ranked inequality condition, Tokens to Group A were the tokens allocated to the high status group; Tokens to Group B – the low status group and Tokens to Group C – the middle status group.

Tokens to Group A, B and C, as recorded by the VIAPPL system were used to measure both unidirectional alliances (one group *sending* to a particular group) and bidirectional alliances (two groups *sending to and receiving* from one another). The unidirectional alliances were easy to measure (and required no manual calculations) as simply including group membership as a predictor in the statistical model (described in detail below) would account for group differences in sending to a particular group. In other words one could measure if Group A was more likely than Group B to have a unidirectional alliance with Group C.

The variables for bidirectional alliances had to be coded manually. First each possible unidirectional sending of tokens was calculated according to group (A→B; B→A; A→C; C→A; B→C; C→A). Therefore, whenever a player from Group A gave to Group B, this would be recorded in the A→B column as a 1. From these measures, bidirectional alliances could be calculated by combining two unidirectional alliance variables. These bidirectional alliances were: AB Alliance, BC Alliance and AC Alliance. Therefore, whenever a player from Group A gave to Group B *or* when a player from Group B gave to Group A, a 1 would be recorded in the AB alliance variable.

Therefore the seven dependent variables from the VIAPPL data collection were: Tokens to Ingroup; Tokens to Group A, Tokens to Group B, Tokens to Group C (unidirectional alliances) and AB Alliance, BC Alliance and AC Alliance (bidirectional alliances).

The following are the definitions were used in this thesis to relate these variables to social identity constructs:

1. Ingroup bias – this was represented by a greater number of tokens allocated to the ingroup compared to the outgroup.
2. Intergroup alliance – this was a behavioural measure where one group allocates a significant number of tokens to another group. This does not preclude ingroup bias but may result in comparatively weaker ingroup bias. Unidirectional alliance is seen as a tendency to give tokens to another group but that this receiving group does not necessarily reciprocate. A bidirectional alliance is seen as a reciprocated exchange of tokens between two groups. For the sake of clarity in the results section the alliances will be reported in the following manner:
    - AB alliance – a bidirectional alliance between Group A and B
    - AC alliance – a bidirectional alliance between Group A and C
    - BC alliance – bidirectional alliance between Group B and C
    - A→B alliance – a unidirectional alliance where Group A is the sender and Group B is the receiver
    - B→A alliance – a unidirectional alliance (B as sender, A as receiver)
    - A→C alliance – a unidirectional alliance (A as sender, C as receiver)
    - C→A alliance – a unidirectional alliance (C as sender, A as receiver)

- B→C alliance – a unidirectional alliance (B as sender, C as receiver)
- C→B alliance – a unidirectional alliance (C as sender, B as receiver)

3. Intergroup solidarity – this consisted of both a behavioural and psychological component. The behavioural component is the same as intergroup alliance while the psychological component is a strong reported superordinate identification as measured by the post-experimental questionnaire (described in more detail below).
4. Social competition – this was operationalised in terms of an avoidance of token exchange with another particular group (or a decrease in allocations to this group over time). It should be noted social competition could not be clearly distinguished from ingroup bias (as participants could either give to the ingroup or outgroup – therefore avoiding outgroup giving could either reflect ingroup bias or intergroup competition). However, in cases where a group avoided giving to one group but not the other then social competition would be clearer.

This study also looked at intergroup behaviour in terms of social network statistics. The dependent variables for this were: relationship persistence, recent relationship persistence, reciprocation (general, immediate and delayed), fairness, preferential, ingroup bias, intergroup alliances and intergroup competition. These parameters which were used during the model building process will be defined and discussed in the data analysis section.

The experimental constants in each of the three conditions include:

- *Group categorization* — participants were divided into one of three groups through random assignment in each study and groups were differentiated onscreen by colour and token balance.
- *Ties* — participants were able to see the pattern of token allocations at the end of each round and use this information to inform tie formation in subsequent rounds
- *Balance* — individual and group total token balances were visible to participants.

In addition to the VIAPPL data, pre and post-experimental questionnaires were administered to the participants. This questionnaire measured levels of ingroup identity, superordinate identity legitimacy, stability, ingroup competition, and perceived alliance in order to explain the results of the token allocation in terms of social identity theory. (See Appendix A for the complete questionnaire). Questionnaire items for each component were limited to a maximum of three items in order to reduce the participants' time in the experiment. This was necessary because in addition to answering the questionnaire *both* before and after the experiment, the game itself was expected to take some time. Each component of the scale is described in detail below.

Ingroup identity:
These items were intended to test how strongly participants identified with, or felt like they were a part of, their group. Questionnaire items included: "I feel strong ties with my group" (adapted from Doosje, Ellemers, & Spears, 1995); "I identify with other members of my group" (adapted from Doosje, Ellemers, & Spears, 1995; Postmes, Haslam & Jans, 2013), "I have a sense of belonging to my group" (Terry, & O'Brien, 2001; Phinney & Ong, 2007). The first two items were used as part of a slightly larger scale by Doosje, Ellemers, and Spears (1995) (α=0.83, 4 items). Besides being used in the previously mentioned scale, the second item has also received support for being a valid and reliable single-item measure (Postmes, Haslam & Jans, 2013) with a convergent reliability 0.85 with a full scale and a test-retest reliability of around 0.64 (from

meta-analysis results). The final item had a factor loading of 0.73 for commitment, an important component of social identity (Phinney & Ong, 2007) and was therefore chosen as the final item. Participants answered the items on a 7-point Likert scale with 1 being strongly disagree and 7 strongly agree, with 4 being 'neither agree nor disagree'

Superordinate identity:
These items were adapted from the ingroup identification items above to test group identity among groups. It was predicted that the social identity items would be able to measure both forms of group identity as identification was not expected to differ qualitatively. This is an approach used by Stone and Crisp (2007). The items were worded as follows: "I identify with one or both of the other groups"; "I have a sense of belonging to one or both of the other groups"; "I feel strong ties with one or both of the other groups". These items were also measured on a 7-point Likert scale as described above. It should be highlighted that a limitation of these items was that they did not distinguish identification with one group to the exclusion of another.

Stability:
The status-stability items measured the degree to which participants felt that the social structure (in the form of token distribution among groups) could change over the course of the game. These items included: "In the next round of the game, how likely are group token differences between groups to change?" (single-item r=0.45) (adapted from Overbeck et al, 2004); "In the next round of the game, I think the relationship between groups will remain stable for the duration of the game" (item-total r=0.69, 2 items) (adapted from Mummendey, Kessler & Kink, 1999); "The current relationship between groups will not change easily" (item-total r=0.67, 2 items) (adapted from Mummendey, Kessler & Kink, 1999). The first item was measured on a 7-point Likert scale from very unlikely to very likely; while the latter two items were measured on the Likert scale described for ingroup and superordinate identification. To measure instability (that change *could* occur), the latter two items were reverse coded in analysis.

Legitimacy:

These items in the questionnaire intended to measure the degree to which participants felt that their group status was legitimate/fair. Items included: "The difference between my group and the other groups is justified and right" (adapted from Weber, Mummendey, &Waldzus, 2002); "The difference between my group and the other groups makes sense" (adapted from Costarelli, 2009); "The difference between my group and the other groups is the way it should be" (adapted from Terry, & O'Brien, 2001). These three items had been used together in a pilot study for the larger VIAPPL project in 2013 where reliability was good (α=0.701). Once again these items were presented on a 7-point Likert scale from strongly agree to strongly disagree.

Ingroup competition:
Two items were intended to measure participants' opinion of the competitiveness of their groups. They were not directly taken from the literature. The items included: "I felt that my group competed with the other groups"; "I felt that my group cooperated with the other groups". These items were also scored on a 7-point Likert scale from strongly agree to strongly disagree. The latter item was reverse coded in the analysis.

Perceived intergroup alliances:
In order to measure how participants viewed potential alliance formations, they were asked to chose a picture which best represented the alliances that they thought developed over the course of the game (see Appendix A for details of the images used). The question was phrased: "Choose which picture best represents cooperation between your group and the other groups" and it was designed specifically for the present study. The choices in response were: no alliances, full intergroup cooperation, AB alliance, AC alliance or BC alliance.

In summary, the research design consisted of three distinct social hierarchies (equality, flat inequality and ranked inequality) made of three groups of different status (equal, high, low and middle) depending on the type of hierarchy. Interaction, in the form of token allocation, occurred between participants in a virtual environment using a novel experimental platform, VIAPPL. Furthermore, a pre and post experimental questionnaire was used to measure social identity (ingroup and superordinate); sociostructural components of social identity (legitimacy, status) and perceptions of ingroup competition and intergroup alliances.

The above design was chosen in order to discover the pattern of alliance behaviour and intergroup solidarity among groups of different status, within a minimal group setting with particular focus on the middle status group. By including a third group and allowing interaction to occur between groups in conditions of inequality, this could possibly provide the minimal conditions for intergroup alliance and solidarity to emerge. Intergroup behaviour was measured by the pattern of ingroup token allocations (to determine ingroup solidarity/social competition) and outgroup token allocations (to determine intergroup alliance). Furthermore, measuring different components of social identity perspective and participants' perceptions of what group behaviours occurred in the VIAPPL game, allowed one to place intergroup behaviour in a psychological context. This enabled one to explore possible patterns relating to motivations or consequences of intergroup behaviour in the VIAPPL setting.

Validity, Reliability and Rigour

VIAPPL

The Virtual Interaction Application (VIAPPL) is still in the early stages of development; however it has been used to collect data for previous experiments in the last two years. While the reliability of VIAPPL is something that needs to be established over time as it is a new research method (Durrheim & Quayle, 2012), the internal validity of VIAPPL is fairly high as the research is conducted in a controlled laboratory environment. The setting is controlled by the following features: random allocation of participants to groups; silence among participants during the VIAPPL game; fingerprint scanning to prevent participants from taking part in the study on multiple occasions; as well as a scripted experimental protocol which researchers used while conducting experiments in order to reduce any possible experimenter effects.

In terms of generalisability, the aim of the study was to look at basic processes of intergroup behaviour in terms of ingroup bias, intergroup alliance and solidarity, not to generalize the findings to any particular population. This was achieved, in part, by stripping the participants of

their unique group category indicators (such as gender, age, race and nationality) and making participants anonymous to one another. However due to the fact that only students from the University of KwaZulu-Natal were sampled, the results are not universally applicable but rather may point toward local social norms.

Psychometric questionnaire

The reliability of the pre and post experimental questionnaire was established post hoc through reliability analysis conducted using the Statistical Package for the Social Sciences (SPSS). Ingroup identification (3 items, $\alpha = 0.815$), superordinate identification (3 items, $\alpha = 0.837$) and legitimacy (3 items, $\alpha = 0.861$) all showed good reliability. Stability showed acceptable reliability when one item was removed (2 items, $\alpha = 0.732$) but competition had less than ideal reliability (2 items, $\alpha = 0.412$). This was perhaps due to the nature of the questions which assumed that cooperation is the inverse of competition, this assumption may not hold. Therefore, when the analysis was run on the competition portion of the questionnaire, only the 1 item directly relating to competition was used.

Sample

As mentioned previously, the main aim of the thesis was to provide initial explorations into intergroup alliance and solidarity as it occurs in a minimal group, experimental context. Therefore, the primary concern of the study was not to generalize the findings and thus non-probability sampling was used.

For practical reasons, convenience sampling on the University of KwaZulu-Natal, Pietermaritzburg campus (where the Psychology Laboratory is located) was implemented. This type of sampling was used because the studies reported in the present thesis required a large sample (162 participants) however, in addition, there were also studies being run for other VIAPPL projects; therefore an even larger population pool was required. Researchers recruited participants before each experiment depending on the availability of the students around campus at that time. In cases where potential participants were interested in participating but not available at the present time, they were asked to sign up for experiments later in the week. Word of mouth among participants aided in the participants signing up without being directly recruited.

The participants consisted of both males and females from all race groups; all of whom were over the age of 18 years. There were a total of 162 participants.

Ethics

Ethical issues in sampling

Participation in the studies was entirely voluntary. Participants were verbally invited to participate in the study. Once at the site of the study, they were given an information sheet to read which explained the nature of the experiment and provided details of their participation therein. They were then asked to sign an informed consent document stating that they understood that their participation was voluntary, they were free to withdraw from the study at any point and that the data collected from them would remain anonymous. (See Appendix B).

Participants were all over the age of 18 years and not sampled from a vulnerable population. In terms of the costs and benefits to participants — the only cost to them was their time, for which they were compensated with cash incentives. In terms of the cash incentives, participants received various amounts (R30, R20 or R10 each) depending on how their group performed in the experiment in terms of token accumulation over the course of the game (R30 for each player of the group who received the most tokens, R20 each for the second group and R10 each for the group with the lowest token balance).

The fact that they would be incentivized according to the outcome of the experiment was explained to them prior to the study and explicitly stated in the informed consent document. This manipulation of the cash incentives was to heighten the reality of the conditions of inequality and status and to more fully engage the participants in the experiment. Once the participants received their cash incentive at the conclusion of the experiment, they were asked to sign a confirmation of receipt of incentive (See Appendix C).

At the beginning of the experiment a low risk deception unlikely to cause any harm was used in order to randomly assign participants into groups. Participants were unaware that their group membership was random but rather, were led to believe that it was based on their estimations in a dot estimation task, a procedure used in the original minimal group studies (Tajfel et al., 1971). This mild deception was used in order to provide some basis for ingroup identification while ensuring that group membership was not based on anything – such as visual accuracy or pattern recognition – which may account for differences in tie formations within the VIAPPL social network.

Ethical issues in data collection

Full ethical approval was granted for this project (see Appendix D).

Participants had their fingerprints scanned before they began the experiment to ensure that one person did not participate more than once. The fingerprints were completely anonymous and not tied to any personal information. In order to begin the game, participants registered a VIAPPL account using their name and email address; however, this was also not linked in any way to the data collected from them in the course of the experiment. Furthermore, their responses to the online Limesurvey questionnaires remained anonymous.

The VIAPPL data has been, and will continue to be, stored on the server in the Psychology Laboratory indefinitely for use in future research projects and publications. The questionnaire data will also be stored indefinitely on the Psychology Laboratory administration account with Limesurvey, online. The data is not accessible to third parties as the server remains in a locked room which requires an alarm code as well as keys to access and the Limesurvey account requires a username and password which is not freely available to anyone. Permission by participants for the future use of their data was ascertained via the informed consent sheet.

Data analysis

Due to the complex nature of the data, namely that it encoded interaction among multiple separate networks of participants in different conditions over a period of 40 rounds; in addition to the inclusion of psychometric data in the form of pre as well as post experimental questionnaires; many phases of analysis were required to fully answer the research questions.

Fortunately, the VIAPPL software allows for the easy exportation of the game data into MS Excel and from there into statistical packages such as R and SPSS. Data analysis was then completed in the following steps:
For the behavioral data:

1. Generalised Linear Mixed Modeling (GLMM) in SPSS
2. Social network analysis – running 3 types of statistical models using the package "relevent" for R.

For the psychometric data:

1. Generalised linear mixed models in SPSS
2. For one measure: Chi-square and Cochrane's Q test for homogeneity and multinomial logistic regression.

Generalised Linear Mixed Modeling

Regarding the behavioural data, the first step was a more traditional means of analysis in order to establish a background for running social network analysis as the latter is a developing field both theoretically and with regards to statistical implementation in software analysis packages.

First, the benefit of the generalized linear mixed model (GLMM) over general linear models (GLM) was that allowed for the testing of overall levels of ingroup bias and alliances, as well being able to determine how these behaviours develop over time in interaction (Shek & Ma, 2011; Bolker et al., 2008). The importance of interaction in the development of social phenomenon has been argued elsewhere in the thesis. This method allowed for the study of time (40 rounds) as a factor to see whether social behaviours were likely to significantly increase or decrease over the course of the experiment.

Second, GLMM was preferred to GLM (even repeated analysis of variance which takes time into consideration) for the analysis of these longitudinal data because the technique allows the analysis of non-normal data (Bolker et al., 2008), unlike GLM's. In the case of VIAPPL, the data is binary in nature (at each round you either give to the ingroup or not, give to the outgroup or not *et cetera*). Analysing the data using repeated measures ANOVA would require for the data to be grouped into waves (consisting of multiple rounds) in order to get it into continuous data format which, although possible, is not ideal.

This GLMM analysis was performed in the Statistical Package for the Social Sciences (SPSS). There were a total of seven variables. One model was run on four of the variables and another on the other three variables, which I will now describe in turn.

Model Type 1

The dependent variables were: Tokens to Ingroup, and Tokens to Group A, Tokens to Group B, Tokens to Group C, as described in the methodology section.

Model Type 1 included the predictors: round (time), status condition (equality, flat and ranked inequality), group (A, B or C) and the interaction between status*group; round*status; round* group and round*status*group. This model was run on all four dependent variables separately as multivariate GLMM are not possible in SPSS. Due to the fact that multiple analyses were run, Bonferroni's correction was applied to reduce the family wise error. Therefore alpha was set at (0.05/4) 0.0125 which was the accepted p value for the overall model.

Model Type 2

The independent variables were: AB Alliance, BC Alliance and AC Alliance.

As described under research design, these variables were manually calculated from the Tokens to Group A, B and C (the variables used in Model Type 1). Since the calculation of the new variables innately encoded group (for example: A gives to B and B gives to A), group membership as a predictor (and therefore the interaction between group and status) was dropped from the model as it would have been redundant. On the other hand, in Model Type 1, group had to be included because Tokens to Group A, B and C (as recorded by VIAPPL) did not account for the group membership of the sender group.

Due to the differences in the variables (namely that one set did not account for the sending group while this set did) two different models were run. Model Type 2 was run for the three variables of bidirectional alliances and included round, status and round*status interaction as the predictors. Bonferroni's correction was (0.05/3) 0.016, therefore before being reported, all models had to be significant at that level.

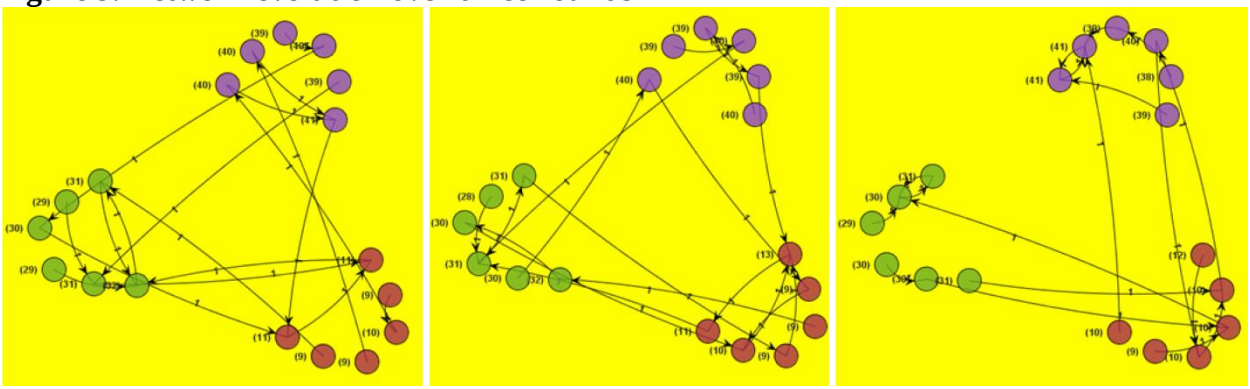
Social Network Analysis

The second stage of analysis for the behavioral data was social network analysis (SNA). A social network is defined by Hanneman and Riddle (2005, p. 17) "a set of actors (or points, or nodes, or agents) that may have relationships (or edges, or ties) with one another". The most fundamental principle behind studying social networks is that "individuals are embedded in thick webs of social relationships and social ties" (Borgatti et al., 2009, p. 892). A social network approach to studying social phenomena is a burgeoning field which is gaining momentum, particularly in sociology, organizational and informational science (Westaby, Pfaff & Redding, 2014).

The primary reason for analyzing the data again using this method was that it can take into account *interpersonal* as well as intergroup motivations for tie formation (or token allocation). In addition to recording 'Tokens to Ingroup' and 'Tokens to Outgroup (A/B/C)' (as described previously), VIAPPL also recorded each individual player's (node's) allocation (or tie) to another player on a round by round basis. Therefore it was possible to analyse the network evolution over the course of the game.

A simple way to illustrate how social network analysis works, is to take the 'rounds moves' images presented to players at each round (see Figure 9). Social network analysis analyses these patterns of interaction between individual nodes in the network over the series of rounds in order to test for motivations behind tie formation. This enables one to see whether, for example, players allocate more tokens to other players who already have a high token balance or if they tend to reciprocate tokens *et cetera*. The GLMM's would not be able to pick up on these specialized network characteristics. One can also include group membership as a covariate; this allowed for intergroup alliances and ingroup bias to be studied (the procedure for this is described below).

Figure 9. Network evolution over three rounds



Note: There are three consecutive rounds from one game presented here. The actual game consisted of 40 rounds of allocations.

Data analysis with the package "relevent" for R

The 'relevent' package (Butts, 2014) for R was designed to analyse longitudinal, event type social network data. Longitudinal social network data refers to network evolution over time rather than a 'snapshot' of a network at one point in time. In the case of the present study, it consisted of 40 rounds or 'event times'. Event based networks refer to social networks which change quite drastically from one measured time point to another (in other words, social ties that form and terminate quickly from one moment to the next) (Butts, 2008). For example, the token exchanges in one round will be nearly completely different from the next round in the VIAPPL environment. Event type data can be differentiated from state data which are network ties that do not rapidly change but tend to persist (for example, friendship is unlikely to change from one time point to another, especially if these time points were close together) (Butts, 2008).

Loading the data

The data from the VIAPPL system were processed via a program designed specifically for VIAPPL in Netlogo (Igwe, Durrheim & Quayle, 2014 [Software]). The software extracted key data from the VIAPPL output and opened them in separate files – one file for each of the nine games. These key data included every sender and corresponding receiver of a token at each of the 40 rounds. In other words, the software converted the relevant VIAPPL data needed for the network analysis into longitudinal link-lists for each game. Once the data were processed through this system it had to be altered in R before it could be used to run models (this is because

the Netlogo program was designed to process the data for a different social network package which was not used because it was more suited to state type data).

'Relevent' requires that the data be in the following format: event time; sender; receiver. The event time has to be unique. However, the VIAPPL platform operates on rounds, meaning that all participants have the same event time for a given round, and the order in which participants made moves is neither recorded nor meaningful. To get around this limitation, each participant was given a random event time 'slot' within a given round. This effectively meant that although the token exchanges were correctly ordered by rounds 1 to 40, participants' token exchanges within a given round were in randomized 'order'. This allowed the data to be analyzed in package 'relevent' for R, at the expense of introducing noise into the round-level data. However, since event-based longitudinal social network analysis is in its infancy there were no alternatives to this method.

Customising covariate event matrices

The package 'Relevent' for R allows the analysis of covariates (such as group membership) through the use of custom covariate event matrices. In order to measure ingroup bias and intergroup alliances, covariate event matrices (that is, matrices that encoded token exchanges taking into consideration group membership) had to be created beforehand. The following three matrices were created to encode overall ingroup bias, comparative ingroup bias and unidirectional intergroup alliances respectively:

1. Overall ingroup bias: This matrix was used to code overall levels of ingroup bias in each game. This was an 18 by 18 matrix (representing the 18 players in each game), where 1 encoded a tie (or token allocation) between members of the same group and 0 encoded outgroup giving. In this matrix outgroup giving therefore acts as the reference category for ingroup bias. In other words, this reference category allowed one to say 'compared to outgroup giving, ingroup bias was a significant trend in this game'. See Figure 10 for a shortened version of this matrix (with 6 players instead of 18 players).

Figure 10. Example of the ingroup bias matrix

		A	B	C	A	B	C
		1	2	3	4	5	6
A	1	1	0	0	1	0	0
B	2	0	1	0	0	1	0
C	3	0	0	1	0	0	1
A	4	1	0	0	1	0	0
B	5	0	1	0	0	1	0
C	6	0	0	1	0	0	1

Note: A/B/C at the top row and left column represent the groups while the numbers underneath and next to groups are the player's identification numbers.

2. Comparative ingroup bias: This matrix encoded ingroup bias per group in order to see which group (Group A, B or C) showed the highest (or lowest) level of ingroup bias. 18 by 8 by 18 matrices, were combined into one multidimensional matrix. In other words, the

multidimensional matrix consisted of **18** smaller (8 by 18) matrices (18 matrices because there were 18 players in each game, therefore one matrix for each player). There were 8 covariates encoded: these covariates were 1) ingroup bias for Group A, 2) ingroup bias for Group B; and all the unidirectional alliances: 3) A→B; 4) B→A; 5) A→C; 6) C→A; 7) B→C; 8) C→A. The first two covariates (ingroup bias for Group A and B) were of interest. Group C's ingroup bias covariate was absent from the matrix. It was purposely dropped in order to create a reference category. This reference category was chosen according to the results of the GLMM's which were run first. The other 6 covariates mentioned above (the intergroup alliances) were not of interest here but had to be included in order to remove outgroup giving from the model. This enabled only ingroup bias to be compared. As an example, Figure 11 shows 3 player's matrices (from Group A, B and C respectively, where each player is the receiver). Only a third of the participants in the game (6 instead of 18) are shown in this example for the sake of brevity.

Figure 11. Example of a multidimensional matrix for comparative ingroup bias.

[1],

	A 1	B 2	C 3	A 4	B 5	C 6
A IngB	1	0	0	1	0	0
B IngB	0	0	0	0	0	0
A→B	0	0	0	0	0	0
B→A	0	1	0	0	1	0
A→C	0	0	0	0	0	0
C→A	0	0	1	0	0	1
B→C	0	0	0	0	0	0
C→B	0	0	0	0	0	0

[2],

	A 1	B 2	C 3	A 4	B 5	C 6
A IngB	0	0	0	0	0	0
B IngB	0	1	0	0	1	0
A→B	1	0	0	1	0	0
B→A	0	0	0	0	0	0
A→C	0	0	0	0	0	0
C→A	0	0	0	0	0	0
B→C	0	0	0	0	0	0
C→B	0	0	1	0	0	1

[3],

	A 1	B 2	C 3	A 4	B 5	C 6
A IngB	0	0	0	0	0	0
B IngB	0	0	0	0	0	0
A→B	0	0	0	0	0	0
B→A	0	0	0	0	0	0
A→C	1	0	0	1	0	0
C→A	0	0	0	0	0	0
B→C	0	1	0	0	1	0
C→B	0	0	0	0	0	0

3. Unidirectional alliances – like the comparative ingroup bias matrix above, this matrix was also multidimensional, consisting of 18 by 8 by 18 matrices. The only difference between this one and the previous matrix was that here, Group C's ingroup bias was included while the C→ B alliance was dropped in order for it to become the reference category to compare the strength of possible alliances against the reference (again, this category was chosen after the GLMM's were run). In other words, this matrix allowed one to test if there was any significant different in the likelihood of an intergroup alliance forming regardless of whether ingroup bias was still more common than outgroup giving. Due to the similarities between these two matrices, Figure 11 also serves to illustrate this matrix.

Model Building

The model building process involved both data-driven (for Model 1) and theoretically based decisions (for Models 1, 2 and 3) regarding which parameters to be included in the final models. Three separate models were run on all of the games. The models had to be run separately as specifying all the covariates simultaneously would result in a saturated event matrix (as there would be no reference categories) resulting in error messages in the 'relevent' package. This may not be the ideal solution as statistical power may have been affected by rerunning models on the same data, increasing family-wise error. Due to the fact that 'relevent' is not well documented, it was not possible to find an alternative solution. The same models (Model 1, 2, 3) were run on all of the games for comparison purposes.

Model 1

This model was used to determine whether ingroup bias, overall, was a stronger trend than intergroup alliances. The "Overall ingroup bias" matrix (described above) was used as the covariate event matrix. In addition, interpersonal measures were also included. These interpersonal measures were chosen as a result of: 1) trial and error testing to see which produced the best model fit; and 2) theoretical interest. The final interpersonal parameters are introduced and discussed below:

Overall relationship persistence: This parameter reflects a tendency for relational ties to persist over the course of the games. In other words, it measures whether actors are more likely to continue allocating tokens to those actors with whom they already have a history of token sending. According to Butts (2008), this parameter represents a form of 'social inertia' where there is a lower likelihood for players to constantly form new ties over the course of the game (that is, there is some consistency in token allocation).

Recent relationship persistence: This parameter indicates whether having recently allocated a token to another player will increase the chance of a token being re-sent in future interactions. The difference between this effect and the previous one is simply that the first looks at relationship persistence of the course of the entire network evolution while the current parameter weights more recent ties more in determining persistence. In other words, is a player more likely to re-send a token if they have sent one in the recent past or is timing not important? Interpreted alongside the above parameter, relationship persistence, a positive parameter for this effect would suggest that tie persistence would occur shortly after the ties are first sent; while a

negative parameter would suggest that if persistence in ties occurs, it would only occur later in the experiment – indicating that players have social memory of what is happening in the VIAPPL environment in that they are able to retain information regarding to whom they have already formed ties.

General reciprocation: This parameter reflects a tendency for actors to send tokens to those who have sent to them in the past. Therefore, at some point in the game, the receiver becomes the sender through reciprocation. Here, timing is not taken into account, while the two other forms of reciprocation reported below consider the effect of timing on reciprocity.

Immediate reciprocity: A form of reciprocation which occurs in the very next round after token reception. For example, if player A sends a token to player B in round one, then in round two player B returns the token to player A. This effect does not require players to have much social memory of the experimental setting, just memory of the previous round.

Delayed reciprocity: The third form of reciprocity also considers the importance of timing but not an immediate response like the previous parameter. In other words it considers the effect that recently being sent a token has on the likelihood of reciprocation. This parameter, when positive, can be interpreted in light of the above general reciprocity effect, as a tendency to reciprocate ties later in the game but not necessarily in the subsequent round (immediate reciprocation).

Preferential attachment versus Fairness: Preferential attachment is a commonly used network statistic used to determine whether social actors with high indegrees (where indegrees are incoming ties from other social actors) are more likely to have more ties directed toward them in the future. In the VIAPPL environment, this means that social actors with a high token balance are more likely to receive even more tokens from other actors in the network in future exchanges. In other words, these players keep accumulating tokens over the course of the experiment due to their wealth (that is, a "rich get richer" effect). This is reflected as a positive parameter. A negative parameter, however, can be thought as a form of fairness where wealth is not allowed to accumulate. This is because the 'rich' receive less tokens from other actors in future rounds.

Model 2

While the first model could ascertain whether ingroup bias was generally a stronger trend than intergroup alliances (as well as interpersonal token exchanges), the role of the second model was to determine if there was a difference in ingroup bias between the three groups (that is, was ingroup bias stronger, or weaker, in one group compared to another). No other parameters were included because the interpersonal parameters had already been tested for in Model 1 and the intergroup alliances had to be tested for in a separate model (Model 3).

Model 3

The first two models determined whether ingroup bias was stronger than outgroup giving (intergroup alliances) and therefore a final social network model was run in order to determine which (if any) intergroup alliances were stronger or weaker (even if, overall, ingroup bias was the most significant behavioural norm).

Meta-analysis of the social network data

The 'relevent' package does not yet allow for the statistical meta-analysis of multiple networks as it is still a developing tool. Therefore the models described above had to be run on a game-by-game basis. In other words, each of the three model types had to be run on each of the 9 games resulting in a total of 18 models being run. In order to make sense of these 18 models, a count-method of meta-analysis was used instead of statistical methods (as the latter was beyond the scope of the present study).

In each game, if there was a significant effect (for example, reciprocity) this was recorded. It was also noted in which direction this effect occurred (that is, a positive or negative parameter). Next, the number of times this effect was significant and positive; or significant and negative was calculated through simple addition.

Psychometric data

As with the behavioural data, generalized linear mixed models were also run on the questionnaire data.

The same GLMM model was run on all of the dependent variables separately and only the models that achieved overall significance were reported in the results section. The predictors included in the model were: trial (that is, time – before and after the game), status condition and group membership, as well as the two-way interactions: trial*group, trial*status, group*status and finally the three-way interaction between status, group and trial.

Bonferroni's correction was not used in this instance as the questionnaire data was not dependent in the same way that the behavioural data was. The latter was considered dependent as ingroup giving measures would be the inverse of outgroup giving measures and therefore inextricably linked. Some authors (see for example: Perneger, 1998) argue that for measures that lack this interdependence, Bonferroni's correction is unnecessary as it reduces the power of the analyses simply due to the nature of the design. In other words, measuring more constructs reduces the power of the analysis in spite of the fact that if one had chosen fewer constructs this same problem would not occur. However, there is still an increased risk of familywise error related to multiple comparisons.

For the final questionnaire item, perceived alliance, a GLMM was not appropriate. Although this item was a repeated measure (like the others); it was also a nominal (rather than ordinal) measure. Therefore the responses recorded were not numerically meaningful. This is because participants had to select one of 5 images – described in the previous section – which they felt represented the type of alliance most commonly observed in the game. Due to the nature of this data, first, separate chi-square tests were run for trial 1 (pre-game) followed by trial 2 data (post-game). The chi-square test allowed one to ascertain whether there were any significant difference in perceived alliance in groups and status conditions *within* trial 1 and trial 2 separately. The results of these chi-square tests were then used to test for homogeneity using Cochran's Q test in order to determine whether there were any differences *between* trial 1 and trial 2 (in other words, did the psychological experience of alliance change over time). Finally, a multinomial logistic

regression was run on the trial 2 data to ascertain a clearer picture of how alliance was perceived during the actual (not the practice) game and how this related to the different status conditions.

Chapter 5: Results

First, the results for the behavioural data from the VIAPPL experiments will be reported. Two generalised linear mixed models will be presented first followed by the results from the social network analysis of the same data using the R package 'relevent' (Butts, 2014). Second, the results from the psychometric measures will be presented.

In order to interpret the results, the following is a brief reminder of the correspondence between the group names and their status in each of the three social hierarchies: Group A, B and C had the same status in the equality condition, while in the flat inequality condition Group A was the high status group, Group B and C the (equally) low status groups. In the ranked inequality condition, Group A was the high status, Group B the low status and Group C the middle status group.

Behavioural data

Generalised Linear Mixed Models

Model Type 1: Ingroup Giving and Unidirectional Alliances

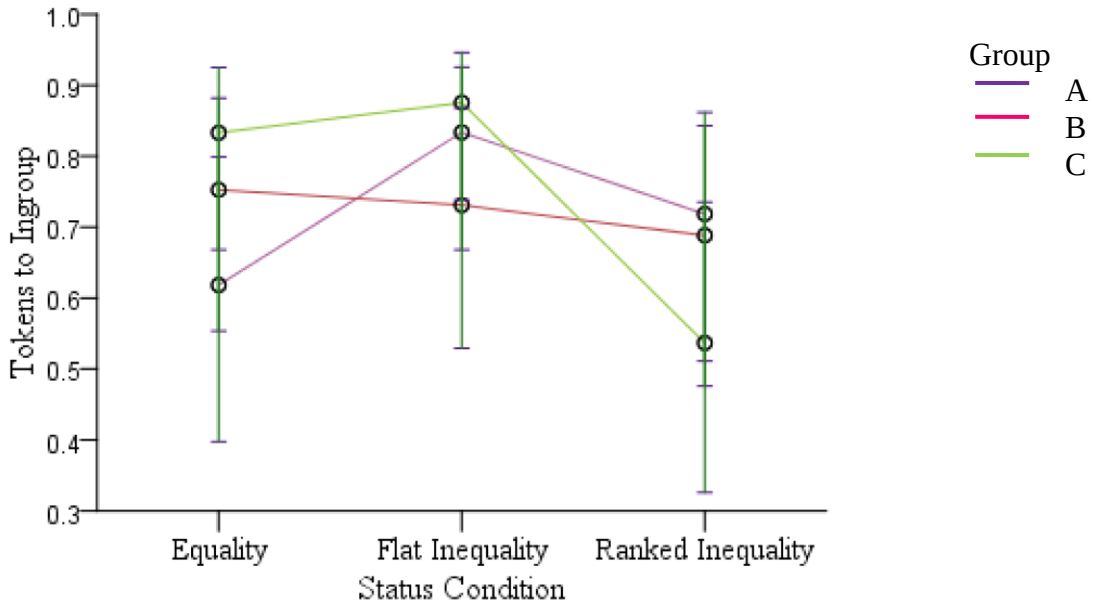
The GLMM model for Tokens to Ingroup was significant ($F(17; 6,462) = 3.858$, $p=0.000$) as were the models for Tokens to Group A ($F(17; 6,462) = 7.825$, $p=0.000$); Tokens to Group B ($F(17; 6,462) = 10.248$, $p=0.001$); and Tokens to Group C ($F(17; 6,462) = 15.896$, $p=0.000$). Therefore all models will be reported and discussed below.

Ingroup bias slows down for the middle status group

The first GLMM model tested ingroup bias to see whether 1) ingroup bias differed among groups and 2) whether it increased, decreased or remained constant over the course of the games. In terms of Tokens to Ingroup, the model indicated that time (the 40 rounds of the game) played an important role in the development of ingroup bias ($F(1; 6,462) = 39.678$, $p<0.005$) . This can be interpreted in light of the significant interaction between status, group and round ($F(4; 6,462) = 3.680$, $p=0.005$) which showed that Group C showed differences in ingroup bias depending on the status condition of the experiments ($F(2; 6,462) = 3.882$, $p=0.021$). In the ranked inequality condition, Group C (M: 0.537, SE: 0.111) (where they were middle status), had a slower rate (speed) of ingroup bias compared to Group C in the flat inequality condition (M: 0.876, SE: 0.051) (Ranked Inequality vs. Flat inequality: $\beta = -0.296$, $SE=0.121$, $p=0.021$) and the equality condition (M: 0.833, SE: 0.064) (Ranked Inequality vs. Equality: $\beta = -0.339$, $SE=0.121$, $p=0.005$). There was no significant difference in Group C's ingroup bias between the equality and flat inequality conditions.

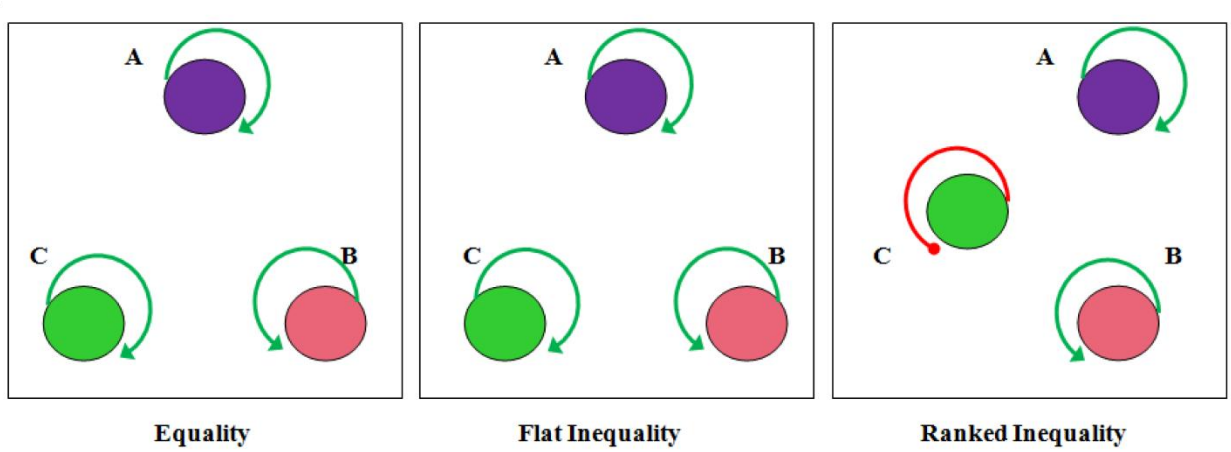
Therefore, it appears that a middle status group (that is, Group C in the ranked inequality condition) in this minimal group context with interaction over time seemed to show reduced ingroup bias over the course of interaction. This was further explored by looking at the results of outgroup giving reported in the following sections.

Figure 12. Ingroup Bias for Group A, B and C across status conditions



Note: The scale of Tokens to Ingroup on the y-axis represents the mean token allocation per person (separated by group and by status condition, therefore 18 players per round (6 per group x 3 replications)). This scale will be used in all the graphs that follow for Model Type 1.

Figure 13. Slower rate of ingroup bias for the middle status group in the ranked inequality condition.



Note: The green self-loops show ingroup bias increases over time while the red self-loop shows ingroup bias slowing down

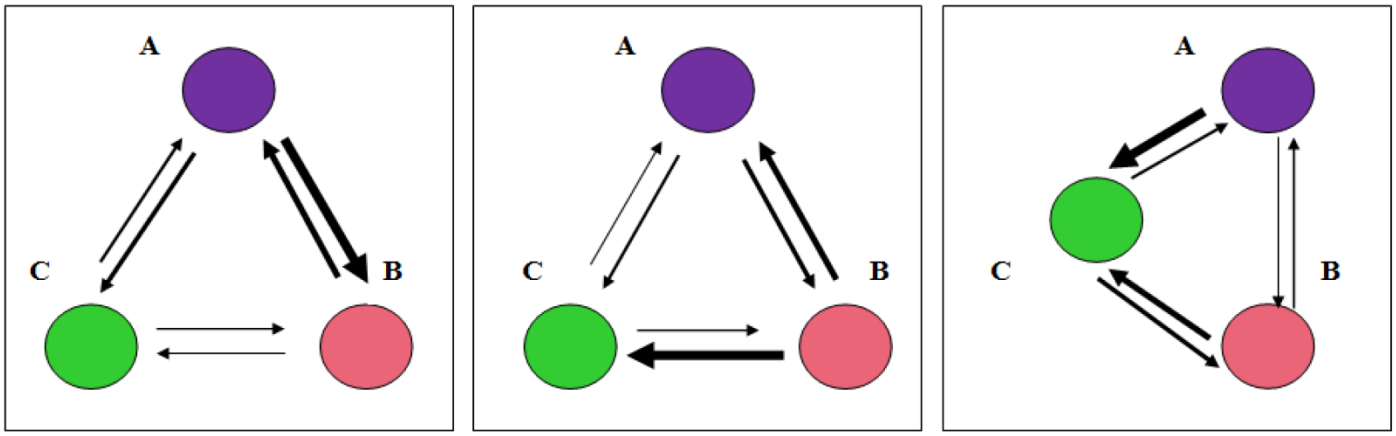
Outgroup Giving

Below are the results from the models for: Tokens to Group A, Tokens to Group B and Tokens to Group C.

Descriptive statistics

Figure 14 illustrates that overall there were differences in the strengths of the alliances between groups according to the status condition of the games. Whether these differences were significant was established by the generalized linear mixed models which follow.

Figure 14. Visual representation of the strength of alliances per status condition



Equality **Flat Inequality** **Ranked Inequality**

Analysis of the descriptives shows that in the equality condition, the allocation of tokens between groups occurred the most with Group A giving tokens to Group B, while Group B giving to Group C occurred the least. There was no reason related to status for this to occur since all groups began the game with equal token balances. This highlights the importance of interaction over time which establishes certain ways of acting in an intergroup setting. In addition, the differences could have something to do with the positioning of the groups as presented to participants onscreen in the game arena. This may cause some patterns of giving to occur more commonly than others due to the visual positioning of groups on-screen, but exploring these potential biases is beyond the scope of the present study.

In the flat inequality condition, Group B gave the most tokens to Group C (the other low status group) and Group C gave the least to Group A (the high status group). However, Group B allocated many tokens to Group A, who returned this to a lesser extent. It appears then that one of the low status groups (Group C) was most likely to engage in ingroup bias while Group B was most likely to attempt to form alliances with the two other groups. Once again, the difference between Group B and C (both being equally low status groups) is only with regards to their position on the screen. It would be difficult to explore this possible 'geographical' effect in the present data as there were only three games per condition with 6 players in a group thus unfortunately there is not enough statistical power to further explore this effect in the present thesis but may be of interest in future studies.

Finally in the ranked inequality condition, the most tokens allocated was in the direction of Group A (high status) to Group C (middle status) while Group B also showed strong allocations

to the middle status group. Group C appeared to more commonly reciprocate with the low status as opposed to the high status group. Therefore the middle status group appears to be most favoured as an alliance partner compared to the other groups and furthermore, returns the alliance to the low status group more commonly than the high status group. The least common alliance was between the high and low status group suggesting that the former is unlikely to help the latter achieve a better position in the hierarchy and the latter appears to rather find alliances with another lower status group against the high status group. The details of these alliances can be seen in Table 5.

Table 5. Sum and mean of alliances per status condition.

	Equality	Flat Inequality	Ranked Inequality
A to B alliance	**187** [0.259 (.439)]	**112** [0.156 (0.363)]	**87** [0.121 (0.326)]
B to A alliance	**155** [0.215 (0.411)]	**115** [0.159 (0.367)]	**110** [0.153 (0.360)]
A to C alliance	**138** [0.192 (0.394)]	**103** [0.142 (0.350)]	**191** [0.265 (0.442)]
C to A alliance	**132** [0.183 (0.387)]	**79** [0.109 (0.313)]	**168** [0.233 (0.423)]
B to C alliance	**87** [0.121 (0.326)]	**121** [0.168 (0.374)]	**179** [0.249 (0.433)]
C to B alliance	**71** [0.099 (0.298)]	**95** [0.132 (0.339)]	**171** [0.238 (0.426)]

Note: The emboldened figures outside the square brackets are the sums of the unidirectional alliance per condition (that is, the total number of times an alliance behaviour (token exchange) occurred over the 40 rounds of three games in that particular condition). The results in the brackets report the mean and the standard deviation. These scores are for each person in the relevant 'sender' group (Group A or B or C) across the three conditions (therefore a total of 18 players, 6 in each game) over the 40 rounds of the game.

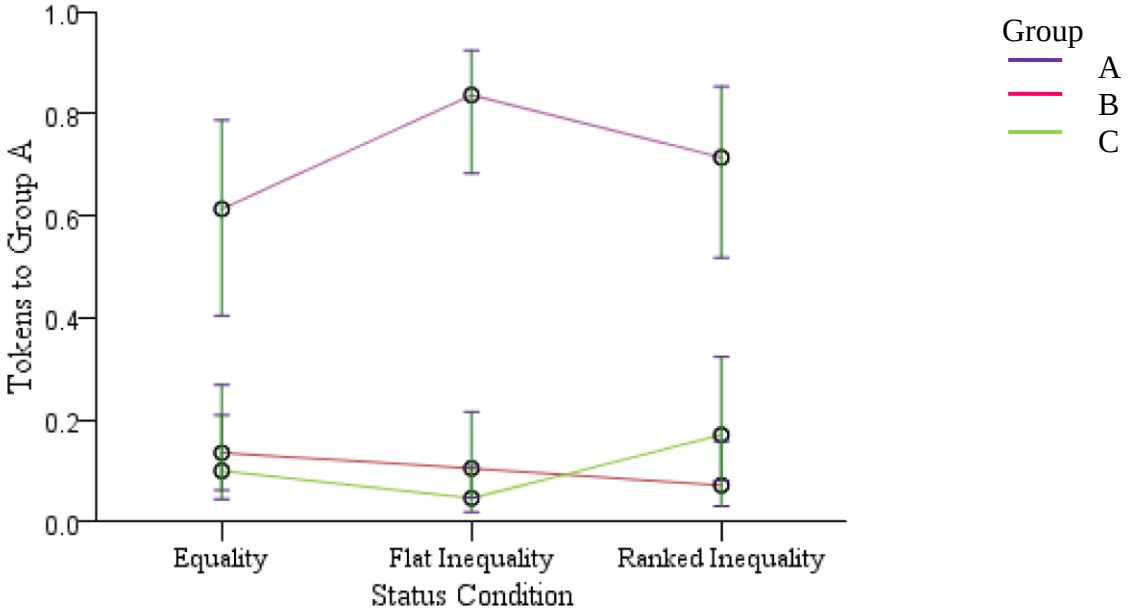
Group A giving: The middle status group is likely to increase allocations to the high status group over time

The generalized linear mixed model for Tokens to Group A showed that there was a significant difference in allocating tokens to Group A between the groups ($F(2; 6{,}462) = 31.036$, $p=0.000$) and that, in particular, Group A (M:0.731, SE: 0.049) was more likely to allocate to Group A than Group B (M:0.101, SE: 0.023; $\beta = 0.630$, SE=0.054, $p=0.000$) or Group C(M:0.091, SE: 0.022; $\beta = 0.637$, SE=0.054, $p=0.000$) and the likelihood of a B→C alliance or a B→A alliance was not significantly different. The finding that Group A was likely to allocate more tokens to Group A than the other groups would be is not surprising as it is simply another way of modeling ingroup bias. Furthermore, the group and round interaction found that time was a significant predictor of giving tokens to Group A ($F(2; 6{,}462) = 23.402$, $p=0.000$), confirming the results from the ingroup giving model by showing that Tokens to Group A was significantly more likely to increase over time in Group A than the other two groups ($\beta = 0.054$, SE=0.019, $p=0.005$). See Figure 15.

In addition, there was a significant three way interaction between status, group and round ($F(4; 6{,}462) = 3.463$, $p=0.008$) which showed that a C→A alliance increased significantly more over time in the ranked inequality (M: 0.171, SE: 0.061) compared to the flat inequality (M: 0.047, SE: 0.021) and equality conditions (M: 0.100, SE: 0.040). That is, the middle status group is significantly more likely to give tokens to the high status group over the course of the game. This

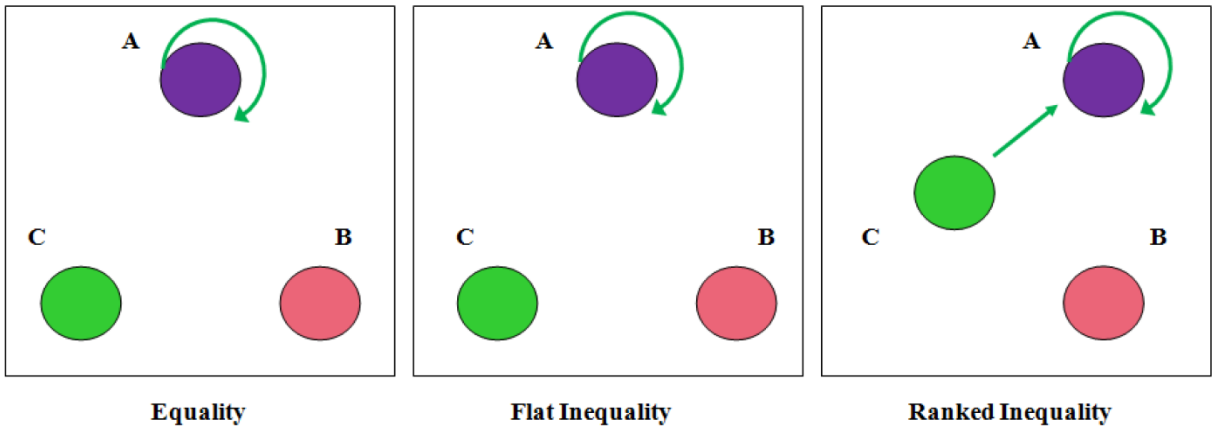
relates to the findings of ingroup bias which shows that the middle status's ingroup bias decreases over time compared to the other two groups.

Figure 15. Tokens to Group A



Note: The above graph shows the group and status interaction but round is excluded as 40 rounds are too many for SPSS to graph and therefore the three way interaction with time is unavailable, however the direction of whether the tokens increase or decrease over time is determined by the direction of the coefficient.

Figure 16. The middle status group in the ranked inequality condition shows a faster rate of giving to Group A



Group B giving: The middle status group is more likely to give to the low status group

Group membership (F(2; 6,462) =32.228, p=0.000) and round (F(1; 6, 462) =6.459, p=0.001) were found to be significant and can further be interpreted in light of the significant interaction between them (F(2; 6,462) =15.245, p=0.000) which showed that Group B was more likely to give to Group B (M: 0.717, SE: 0.042) than Group A (M: 0.104, SE: 0.020) and Group C were (M:0.095, SE:0.019) and that this self-giving increased significantly over time (β =0.067, SE=0.019, p=0.000). This once again confirms the model for ingroup giving showing that ingroup bias was a strong trend which increases over time.

There was also a significant interaction effect between group and status (F(4; 6, 462) =3.685, p=0.005). Closer inspection of the pairwise contrasts shows that there was a significant difference in a C→B alliance occurring in the three conditions (F(2; 6, 462) =3.099, p=0.045) such that this unidirectional alliance was stronger in the ranked inequality condition (M:0.202, SE:0.058) compared to the equality condition (M:0.052, SE:0.019; β =-0.150, SE=0.061, p=0.014) and the flat inequality condition (M: 0.077, SE: 0.027; β =-0.125, SE=0.064, p=0.050). This means that there was a significant unidirectional alliance between the middle status group and the low status group. Once again, this can be seen in light of the middle status group's slower rate of ingroup bias in the ranked inequality condition.

Figure 17. Tokens to Group B – Status and Group interaction

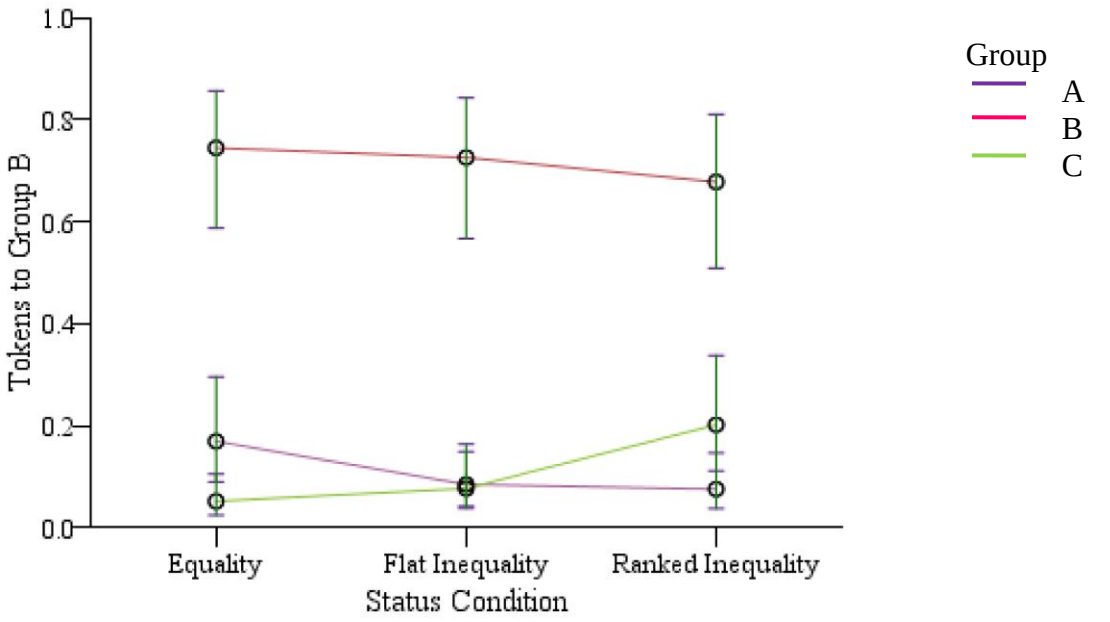
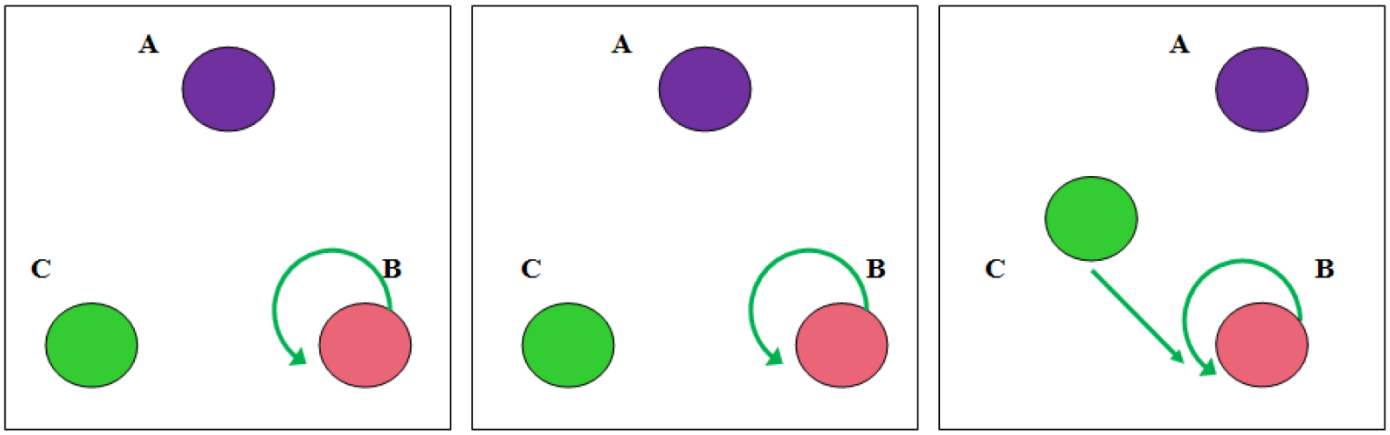


Figure 18. The middle status group in the ranked inequality condition is overall more likely to give to the low status group



Equality **Flat Inequality** **Ranked Inequality**

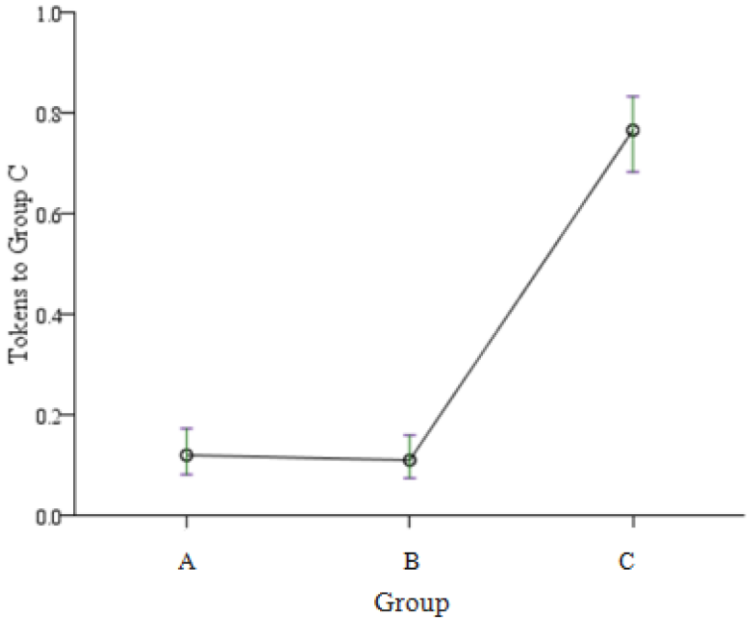
Group C giving

Finally, the model for Tokens to Group C showed a significant main effect for group membership ($F(2; 6,470) = 19.566$, $p=0.000$) and for the interaction between group and round ($F(2; 6,470) = 28.030$, $p=0.000$). However, as there was no significant two-way interaction between group and status or a three-way interaction between group, status and round.

The estimated marginal means indicate that overall across the conditions (when Group C was an equal, low and middle status group), Group C was more likely to give to Group C (engage in ingroup bias) (M: 0.766, SE: 0.038) than Group A (M: 0.120 SE: 0.023) or Group B (M: 0.110, SE: 0.021) were (this can be seen in Figure 19). Because an interaction with the status condition was not significant in this model, that ingroup bias slowed for the middle status group is not represented here.

Furthermore, the significant interaction effect between group and round showed that Group C's ingroup bias was significantly more likely to increase over time compared to a B→C alliance (Group B: $\beta = -0.053$, $SE=0.021$, $p=0.010$). However, C's increasing ingroup bias was not significantly different from an A→C alliance (Group A: $\beta = -0.036$, $SE=0.021$, $p=0.079$). However, as there was no significant two-way interaction between group and status or a three-way interaction between group, status and round, it is difficult to further interpret the possible reason behind this lack of difference.

Figure 19. Tokens to Group C per Group



Model Type 2: Bidirectional Alliances

The following models tested the likelihood of alliances between two groups across the status conditions. The models for all three variables – AB alliance (F(5; 6,474) =7.091, p=0.000), AC alliance (F(5; 6,474) =20.611, p=0.000) and BC alliance (F(5; 6,474) =11.136, p=0.000) – were significant and thus are reported below.

AB Alliance: Intergroup competition between the high and low status group in the ranked inequality condition

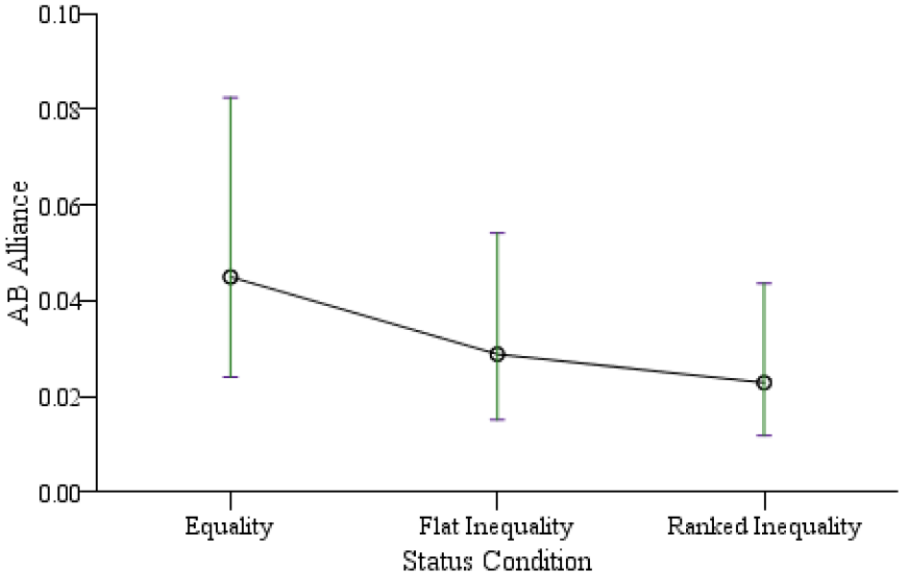
Time was shown to be an important factor in the development of an AB alliance (F(1; 6,474) =28.703, p=0.000). Firstly, overall; the AB alliance decreased over time during the course of all the experiments (β =-0.047, SE=0.009, p=0.000). This is possibly attributed to the overall increase over time of ingroup bias as reported above.

In addition, however, time interacted with the status condition to determine the rate of alliance formation (F(2; 6,474) =3.370, p=0.034) such that the alliance between Group A and B seemed to increase significantly more over time in the equality (M: 0.045, SE : 0.014; β =0.027, SE=0.013, p=0.034) and flat inequality condition (M:0.029 SE: 0.009; β =0.031, SE=0.013, p=0.016) compared to the ranked inequality condition (M: 0.023, SE: 0.008). This presents an interesting finding in that as it shows that the development or evolution of an alliance over time between the high and low status group in the ranked inequality condition is significantly less likely to occur than in the other two conditions.

In the equality condition, the status of Group A and B is not a determining factor in their alliance as they are both of the same status, therefore this condition acts as a control condition which shows how manipulating inequality reduces the chance of an alliance forming between the high

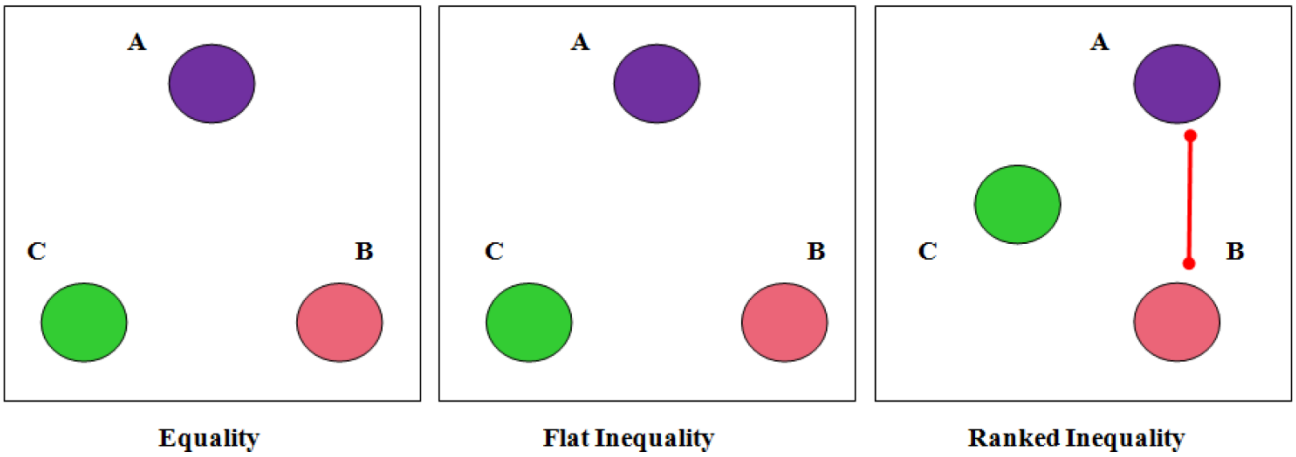
status (Group A) and a low status (Group B) group in both the flat and ranked inequality condition. Furthermore, the fact that the AB alliance had a slower rate of growth in the ranked inequality condition compared to the flat inequality condition shows that adding a middle status group reduces the speed at which a possible alliance will form between the high and low status group.

Figure 20. AB alliance across status



Note: The scale for bidirectional alliance on the y-axis represents the mean alliance behaviour per person per round (where players are separated by group and status condition such that it is the mean of 36 players (12 players x 3 conditions). This scale is the same for the following bidirectional alliances.

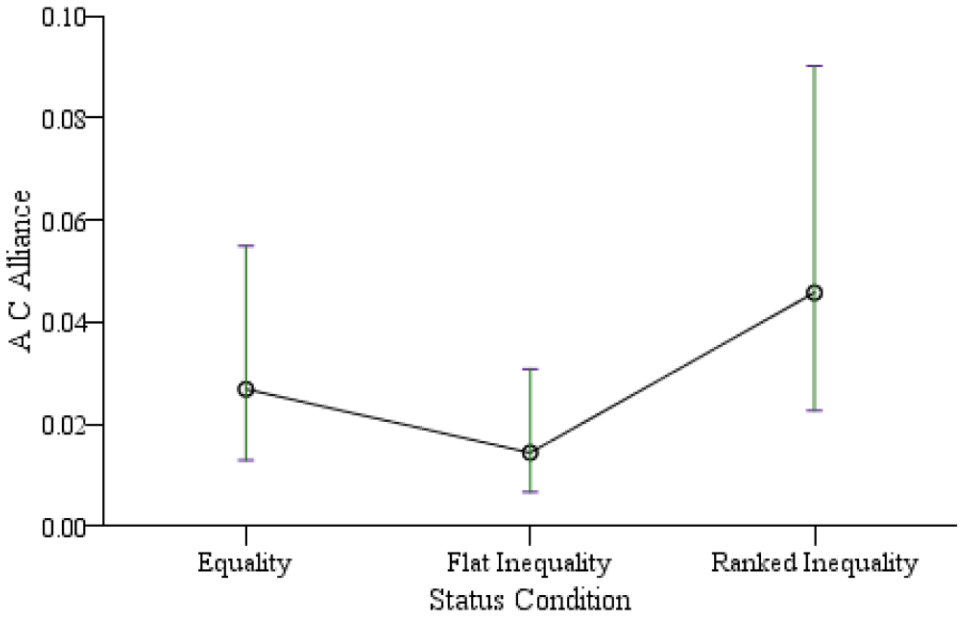
Figure 21. A slower rate of an AB alliance in the ranked inequality condition



AC Alliance: Deceleration over time in all conditions

Once again time significantly predicted the possible alliance between Group A and Group C ($F(1; 6{,}474) = 99.656$, $p = 0.000$) but showed that this alliance was likely to decrease significantly over time ($\beta = -0.053$, $SE = 0.012$, $p = 0.000$). There was also no significant difference between the status conditions, indicating that the middle status and high status group in the ranked inequality condition are just as unlikely to form an alliance compared to the other two conditions where 1) the groups are of equal status and 2) where the high and one of the low status groups forms an alliance.

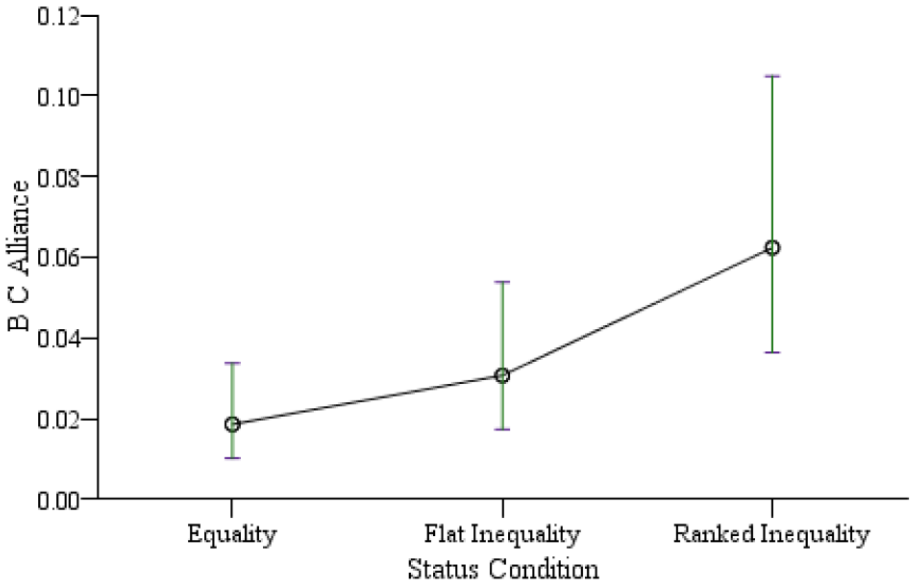
Figure 22. AC Alliance across status conditions.



BC Alliance: Deceleration over time in all conditions

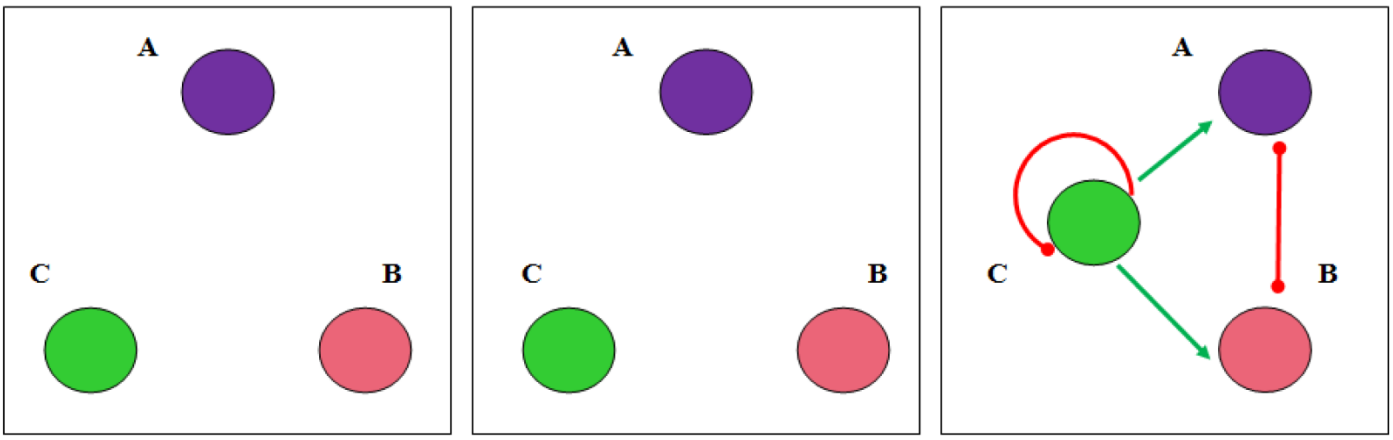
As with the AC Alliance, time also predicted the alliance formation ($F(1; 6{,}474) = 45.995$, $p = 0.000$) in the same direction ($\beta = -0.037$, $SE = 0.010$, $p = 0.000$), meaning that the BC alliance was also likely to decrease significantly over time. As with the AC Alliance, there was no significant difference in alliance formation between these two groups across the conditions, meaning that in the ranked inequality condition, the middle and low status group are not likely to form an alliance greater than chance. The overall decrease in AC and BC alliances can be related back the overall increase in ingroup bias over time in all the groups (the results from Model 1).

Figure 23. BC alliance across status conditions.



Summary of Model Type 1 and Model Type 2

Figure 24. Combined summary of Model Type 1 and Model Type 2 results of GLMM



Equality **Flat Inequality** **Ranked Inequality**

Note: The green arrows show where allocations are significantly more likely to occur while the red lines show where this is likely not occur or reduce over time.

In summary, the results of the generalised linear mixed models (Model 1 and Model 2) show that ingroup bias was a strong trend and that it increased over time during the course of the game. Furthermore, every group shows ingroup bias in that they are more likely to give to their own group than other groups are to give to them. Notably, however, the middle status group in the ranked inequality condition was shown to have a slower rate of ingroup bias over time. This

tendency is supported by the fact that the middle status group had a faster rate of allocating tokens over time to the high status group. However, they also had an overall, constant tendency to allocate tokens to the low status group (which did not change as a function of time, unlike the former finding). Therefore, being stuck in the middle of two groups seems to have a significant effect on reducing ingroup bias over the course of the game. What the models cannot answer is whether Group C favoured Group A or Group B significantly differently. However, the descriptives indicate that Group C more commonly gave to Group B, the low status group.

In terms of the bidirectional alliance between Group A and B, it was found that this alliance significantly decreases over time in the ranked inequality condition compared to the other two conditions. This suggests that adding a middle status group to the social hierarchy reduces the chances of a high to low status group alliance. This effect is illustrated in Figure 24.

Finally, Figure 24 also draws attention to the fact that there are not any significant differences in behaviour (ingroup bias, outgroup giving or alliance formation) between the equality and flat inequality condition which was an unexpected finding. This emphasizes the importance of considering a middle status group in the traditional dichotomous design (high versus low).

Social Network Analysis

Following the findings of the GLMMs, social network analysis was run on each of the games individually in order to elaborate on the key findings as well as take into account how the patterns of allocations were embedded in *interpersonal* as well as intergroup interactions. As described in the methods section, three types of models were run on the data. The social network analysis is largely reported on a per game basis; highlighting the importance of the specific social context that developed among participants and their groups over time in interaction in the VIAPPL environment. This is an important consideration as all human action is embedded in context and cannot be separated from it. Behavioural norms develop over time as people negotiate their social environment, influencing and being influenced.

As described in the methodology section, three models were run on each of the 9 games. Model 1 shows general trends regarding interpersonal token allocation as well as compares the significance of ingroup giving to any form of outgroup giving (including intergroup alliances). This model was used to first establish whether ingroup bias, for all groups regardless of status, was more likely than intergroup alliances. In other words, it showed an individuals' tendency for allocation decisions regardless of their group membership. Model 2 shows the relative strength of ingroup bias among three groups (that is, which group within a game showed the most or least ingroup bias). This model was intended to show if there was any trend-following behaviour, regarding ingroup bias, within a group. Finally Model 3 indicates the relative strength of intergroup alliances. Model 2 and 3 were used to study *group* behaviour (that is, they compared behaviour according to group membership) and are therefore presented together.. The findings from these three models are reported below.

Model 1: Overall Ingroup Bias and Interpersonal Interaction

Table 5 provides a summary of the results from Model 1 of the social network analysis. This model tested for overall levels of ingroup bias as well as the 'interpersonal' tie exchange tendencies between social actors in the VIAPPL environment.

Table 6. Count-method meta analysis of Model 1 – Ingroup bias and interpersonal tie exchange strategies

	Game condition		
	Equality	Flat Inequality	Ranked Inequality
Ingroup Bias	**3**(3+, 0)	**3**(3+, 0-)	**3**(3+, 0-)
Preferential attachment (+) versus Fairness (-)	**3**(0+, 3-)	**3**(0+, 3-)	**1**(1+, 0-)
Overall relationship persistence	**3**(3+, 0-)	**3**(3+, 0)	**3**(3+, 0-)
Recent relationship persistence	**3**(2+, 1-)	**2**(0+, 2-)	**1**(0+, 1+)
General reciprocation	0	**1**(0+, 1-)	**1**(0+, 1-)
Delayed reciprocation	0	**1**(1+, 0-)	**2**(2+, 0)
Immediate reciprocation	0	0	0

Notes: The emboldened numbers indicate the number of games (out of 3) in which the parameter was significant. Figures in brackets show, for significant parameters, how many were positive and how many were negative

Ingroup bias is more likely to occur than intergroup competition

First, Model 1 was used to test overall levels of ingroup bias compared to any other possible form of outgroup giving and alliance formation, in all of the games across the three conditions. Ingroup bias was strongly significant for all nine games in all three conditions thus supporting the results of the GLMM which showed that ingroup bias was an emergent group norm for all groups in regardless of the condition. The fact that ingroup bias was a more likely strategy than intergroup alliance seems to provide some evidence that even in multigroup settings where the stark dichotomy of 'us versus them' is not apparent, ingroup bias is. Therefore adding a third group does not seem to reduce the competitiveness of the intergroup setting as ingroup bias remains strong.

Fairness: Avoiding the 'rich'

In terms of the patterns of interpersonal token exchange, this model shows that in the equality and inequality conditions, in all 6 games, the players tended to show fairness, that is, they avoided allocating tokens to players with high token balances. However, in the ranked inequality condition, this pattern of fairness was not significant in any of the games and furthermore, in one game, there was a strong tendency to show preferential attachment, meaning that in this game players actually tended to allocate more tokens to players who already had a high token balance; in other words, the rich got richer.

For all the games, in each condition, there was also a tendency for players to persist in their tie sending, meaning that they were significantly more likely to allocate tokens to players that they had a history of allocating tokens to, rather than giving indiscriminately regardless of an interaction history. This shows a form of social inertia and highlights the fact that 'friendships' form in this minimal group environment over time. However, the recency of this effect is not very strong meaning that this tie persistence occurs over many rounds and across the entire game, not that players send to the same players for a short period of time and then change the targets of their token allocations.

Overall, reciprocation was not a strong trend in the VIAPPL games, in fact players tended to avoid reciprocating ties in two of the games, one in each inequality condition and furthermore, immediate reciprocation (that is, returning a token to a player in the round directly following the receipt of the token) was not apparent in any of the games in any condition. However, three games (1 in the flat inequality and 2 in the ranked inequality condition) showed strong reciprocation in the localized environment, meaning that players tended to return ties in the next few rounds following the receipt of a token, but not in the round directly after (as indicated by a lack of immediate reciprocation). Therefore players in these games showed social memory in the VIAPPL environment.

These results will be further explored on a game by game basis in order to further understand the patterns of ingroup bias and alliance formation modeled in the second and third network models presented below.

Model 2 & 3: The role of context in the formation of ingroup bias and intergroup alliances

Due to the fact that the interpretation of intergroup alliances/competitions between two groups would be more understandable in context of the third group; a more detailed look at these, as well as ingroup bias, will be presented here on a game by game basis in order to present the results in context. These games will be illustrated in order to clarify the results.

The details of Model 2 and Model 3 can be found in the methodology section. To briefly summarise, it must be noted that for Model 2 (measuring relative ingroup bias) Group C was used as the reference category. This was the chosen category as it was found (through from the GLMM's) that ingroup bias significantly decreased over time for the middle status group (Group C in the ranked inequality condition). Therefore comparing Group C to Group A and B's relative levels of ingroup bias seemed appropriate as Group C's ingroup bias was already established In Model 3 (the relative strength of alliances), a C to B unidirectional alliance was the reference category as the GLMM's show that this was a strong and consistent alliance in the ranked inequality condition, therefore being able to compare this to the strength of giving to Group A as well as the fact that then the strength of an alliance/competition between Group A and B is open to study.

Each game is summarized graphically. The graphics show if, and where, there are significant differences between the reference category behaviour and all the other behaviours. No significant

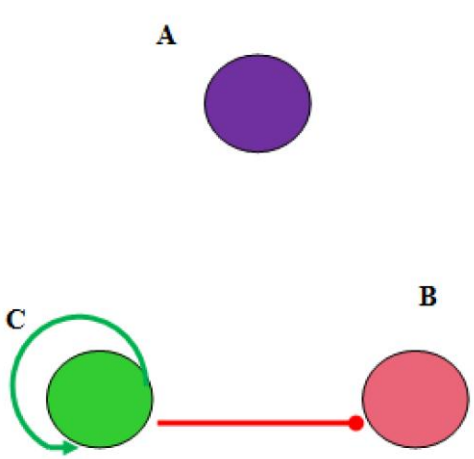
difference does not mean the behaviour was not present but only that groups did not differ in this regard.

Equality condition

Game 1

In the first game, Group C was significantly more likely to engage in ingroup bias than the other two groups (Group C vs Group A: $\beta = -0.345$, SE=0.076, $p<0.000$; Group C vs Group B: $\beta = -0.155$, SE=0.072, $p<0.01$). Furthermore, there was a significantly lower chance of a C→B alliance than any other alliance patterns forming (AB: $\beta = 2.818$, SE=0.364, $p<0.000$; BA: $\beta = 2.485$, SE=0.368, $p<0.000$; AC: $\beta = 1.833$, SE=0.381, $p<0.000$; CA: $\beta = 1.909$, SE=0.379, $p<0.000$; BC: $\beta = 1.178$, SE=0.404, $p<0.001$), bearing in mind that C→B was the reference category.

Figure 25. Game 1, Equality condition

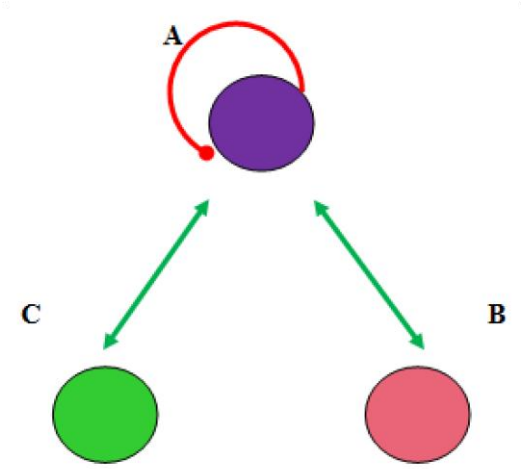


Note: Green lines represent significant presence of a behaviour while red lines indicate a significant absence of a behaviour.

Game 2

Group A was significantly less likely to engage in ingroup bias in this game ($\beta = -0.375$, SE=0.089, $p<0.000$) while there was no significant difference between Group B and C's level of ingroup bias. With regards to intergroup alliances, compared to a C→B alliance, Group B was not significantly more or less likely to reciprocate. Furthermore, a bidirectional AB alliance (AB: $\beta = 0.903$, SE=0.153, $p<0.000$; BA: $\beta = 0.742$, SE=0.157, $p<0.000$) and AC alliance (AC: $\beta = 0.693$, SE=0.158, $p<0.000$; CA: $\beta = 0.624$, SE=0.160, $p<0.000$) was more probable compared to a C→B alliance. Overall this seems to suggest that in this game, a bidirectional alliance between Group C and B was least likely to occur. Therefore in light of this, it appeared that Group A engaging in more outgroup giving than the other two groups encouraged Group C and B to reciprocate this generosity while avoiding each other.

Figure 26. Game 2, Equality condition

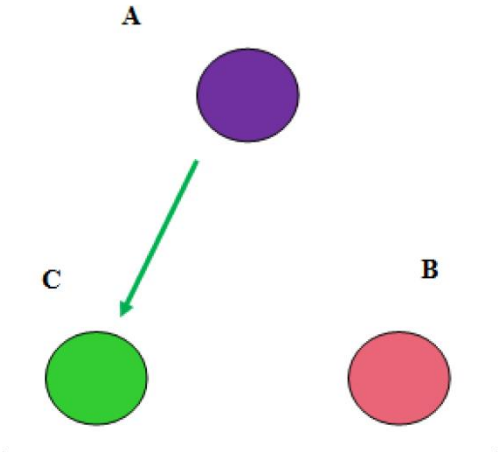


Note: Green lines represent significant presence of a behaviour while red lines indicate a significant absence of a behaviour.

Game 3

In this game, there was no significant difference in ingroup bias between Groups A, B and C. Therefore, groups were equally likely to show ingroup bias. In addition it was significantly more likely for an A→C alliance to form ($\beta = 0.360$, SE=0.151, $p<0.01$) than C→B alliance.

Figure 27. Game 3, Equality condition



Note: Green lines represent significant presence of a behaviour while red lines indicate a significant absence of a behaviour.

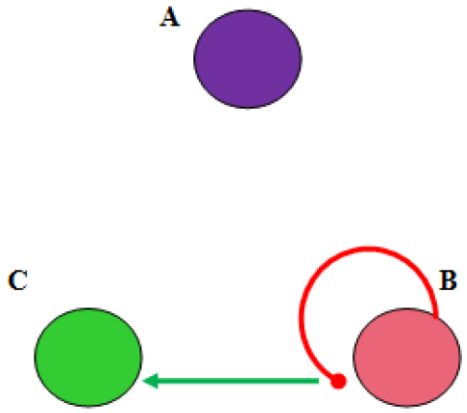
Overall, these results suggest that Group A was significantly more likely to engage in outgroup giving than Group C was to give to Group B and in one game this was emphasized by a significantly lower chance of ingroup bias for Group A. This pattern is supported by the descriptive statistics presented at the beginning of the GLMM models.

Flat Inequality condition

Game 1

Group B was significantly less likely to engage in ingroup bias in this game ($\beta = -0.298$, SE=0.078, $p<0.000$) than Group A and C and this can be explained in light of the fact that this group (one of the low status groups) was significantly more likely to give tokens to Group C (the other low status group) ($\beta = 0.869$, SE=0.165, $p<0.000$) than C to B (and there was no significant difference between this latter alliance and the others).

Figure 28. Game 1, Flat Inequality condition

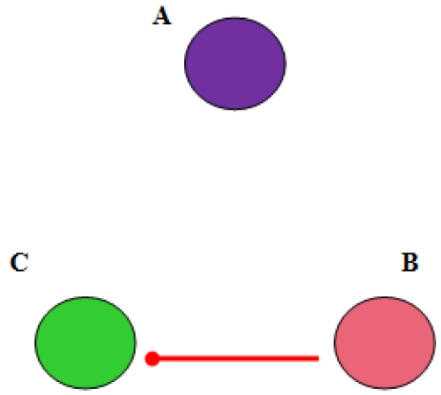


Note: Green lines represent significant presence of a behaviour while red lines indicate a significant absence of a behaviour.

Game 2

There was no significant difference in ingroup bias across the three groups. Furthermore, a B→C alliance was significantly less likely to occur ($\beta = -0.357$, SE= 0.174, $p<0.01$) than a C→B alliance. This seems to indicate that Group B was likely to avoid forming an intergroup alliance with Group C in this game.

Figure 29. Game 2, Flat Inequality condition

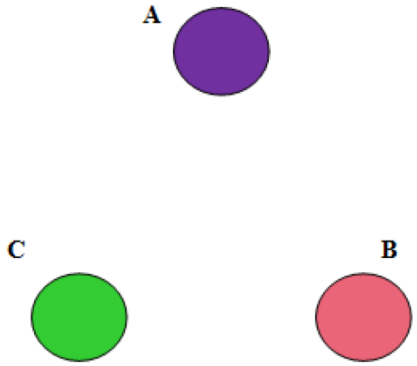


Note: Green lines represent significant presence of a behaviour while red lines indicate a significant absence of a behaviour.

Game 3

Ingroup bias was not significantly different among the three groups. There was also no significant difference between the unidirectional alliances or the bidirectional alliances.

Figure 30. Game 3, Flat Inequality condition



Note: Green lines represent significant presence of a behaviour while red lines indicate a significant absence of a behaviour.

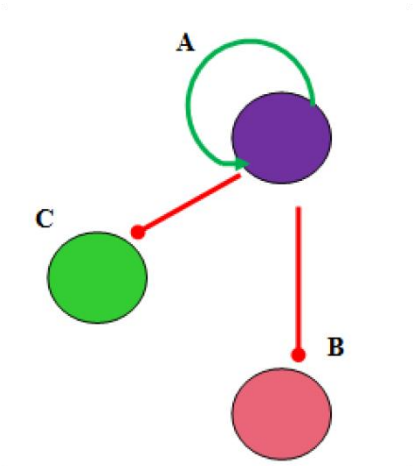
Overall, these results show no significant bidirectional alliances between the two low status groups, although in one game one of these groups was more likely to give to its fellow low status group than for that group to reciprocate. Compared to the equality condition, Group A was not more likely to engage in outgroup giving. Perhaps this has to do with the fact that in the equality condition there is some sort of positioning effect which causes Group A in the equality condition not to see their position at the top of the hierarchy to be legitimate as every group has equal token balances. This will be elaborated on when the results of the psychometric measures are presented.

Ranked Inequality condition

Game 1

Group A (the high status group) was significantly more likely to engage in ingroup bias compared to Group C ($\beta = 0.263$, SE=0.078, $p<0.000$). As a result, Group A was significantly less likely to give either to Group B ($\beta = -0.960$, SE=0.196, $p<0.000$) or Group C ($\beta = -0.384$, SE=0.162, $p<0.01$) compared to a C→B alliance. Since a C→B alliance was not significantly different from a C→A alliance, this means that the middle status group did not show favouritism to the high or low status group.

Figure 31. Game 1, Ranked Inequality condition

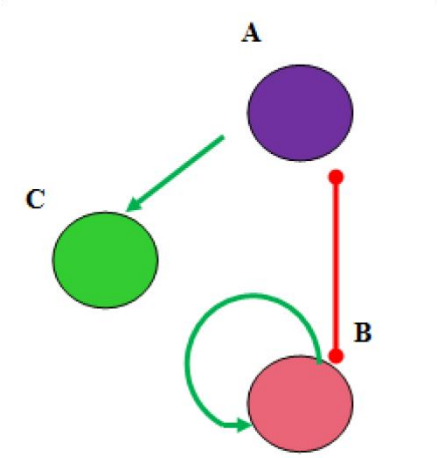


Note: Green lines represent significant presence of a behaviour while red lines indicate a significant absence of a behaviour.

Game 2

In this game, the low status group (Group B) was significantly more likely to show ingroup bias ($\beta = 0.318$, SE=0.099, $p<0.000$) than the other two groups. An A→B alliance (high to low status) was once again significantly less likely to form ($\beta = -0.434$, SE=0.134, $p<0.001$) and, in this game, Group A was significantly more likely to allocate tokens to Group C (the middle status group) ($\beta = 0.312$, SE=0.111, $p<0.001$) compared to C→B alliance. However, Group C was not significantly more likely to reciprocate the A→C alliance. In addition, the low status group was significantly less likely to try form an alliance with the high status group (B→A alliance) ($\beta = -0.278$, SE=0.128, $p<0.01$). Since an AB alliance was significantly less likely to occur, one can say that the high and low status groups were engaged in some form of social avoidance or competition. There was no significant difference between a C→B and C→A alliance; therefore the middle status group gave equally to both the low and high status group.

Figure 32. Game 2, Ranked Inequality condition

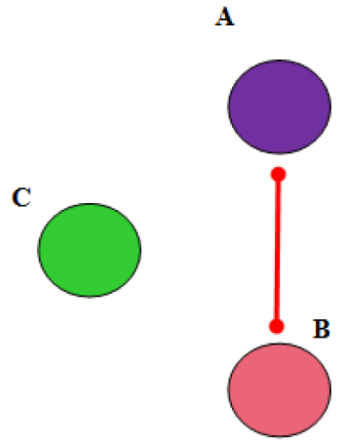


Note: Green lines represent significant presence of a behaviour while red lines indicate a significant absence of a behaviour.

Game 3

There was no significant difference in ingroup bias among the three groups in this particular game. An intergroup alliance was significantly less likely to form between the high status (Group A) and the low status group (Group B) (A to B: $\beta = -0.835$, SE=0.177, $p<0.000$; B to A: $\beta = -0.331$, SE=0.212, $p<0.000$) than a C→B alliance. Furthermore, the middle status group was not likely to favour either the high or low status group as there was no significant difference between the C→B and C→A alliances.

Figure 33. Game 3, Ranked Inequality condition

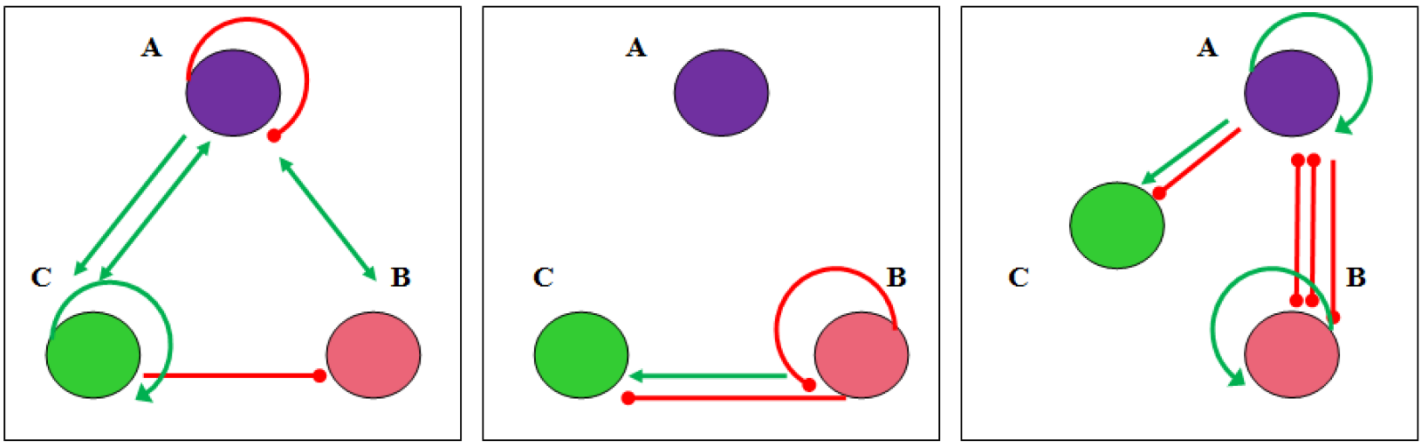


Note: Green lines represent significant presence of a behaviour while red lines indicate a significant absence of a behaviour.

Overall, the results from the ranked inequality games confirm the GLMM model which showed that an alliance between Group A and B is least likely and decreases over time. Furthermore, the middle status group was not shown to allocate more tokens to the high or low status group.

Summary of social network results per condition

Figure 34. Combined summary of network analysis results



Equality **Flat Inequality** **Ranked Inequality**

Note: Green lines represent significant presence of a behaviour while red lines indicate a significant absence of a behaviour.

The cumulative results from the SNA models are displayed in Figure 30, with all important effects superimposed for each condition. The social network analysis confirms the findings from the descriptives and generalized linear mixed models and add to them by highlighting the fact that each game provides a unique intergroup setting in which norms of behaving develop in interaction according to the unique context. Figure 34 shows that group patterns of behaviours are not the same for every game in a particular social hierarchy (status condition). However there are some trends that are more likely to occur in one condition compare to another. For example, a significant lack of AB alliance is seen in all of the ranked inequality games but not the other two conditions. That behavioural norms are embedded in context and arise as a result of interaction over time is a core argument for why including interaction in experiments is important for social psychological research which will be further addressed in the following chapter.

In addition the network analysis shows, from Model 1, that interpersonal as well as intergroup behaviour exists. Overall, social inertia regarding one's choice of token exchange partner was apparent as well as fairness regarding individual token balance (as participants avoided giving to the rich). Since ingroup bias was confirmed to be significantly more likely than outgroup giving, these interpersonal forms of token exchange most likely related to ingroup giving meaning that 1) participants were more likely to allocate tokens to one's ingroup and 2) within this ingroup bias, different patterns of allocation emerge, namely fairness (although notably not in the ranked inequality condition) and social inertia, while surprisingly reciprocity was not a strong trend (particularly in the equality condition where no form of reciprocation existed).

In terms of intergroup alliances, the strongest result is the lack of intergroup alliance between the high and low status group in the ranked inequality condition as well as the fact that the middle status group in this condition, did not show favouritism to the high or low status group. These findings are supported by both the descriptives and the generalized linear mixed models.

Psychometric data

First, the generalized linear mixed models will be presented, followed by the results of perceived intergroup alliance. As the alliance perception measure was nominal, as well as being a repeated measure, the analysis followed the procedure of using a Chi-Square for pre- and post-test results and a Cochran's Q test to show change, as well as a multinomial logistic regression (as discussed in the data analysis section).

Generalised Linear Mixed Modeling

The models for ingroup identification ($F(17, 301) = 2.996$; $p=0.000$); superordinate identity ($F(17, 301) = 1.769$; $p=0.031$); stability ($F(17, 301) = 2.553$; $p=0.001$); legitimacy ($F(17, 301) = 1.927$; $p=0.013$) and competition ($F(17, 301) = 2.136$; $p=0.006$) were significant.

Ingroup identification

This model measured the levels of ingroup identification among the three groups in the different status hierarchies in order to determine whether higher group status would result in a stronger ingroup identity for participants. The GLMM showed that the interaction between the status condition and group membership was significant ($F(4, 301) = 4.599$; $p=0.001$) but that this can be interpreted in light of the significant three way interaction between trial, status and group ($F(4, 301) = 6.660$; $p=0.000$) which shows that after trial 2 (which was the actual game, not the practice rounds) there was a significant difference in ingroup identification among the three groups. This means that all groups in all conditions had similar levels of ingroup identification at the beginning of the experiment (after they had finished two practice rounds). This suggests that ingroup identification changes over the course of the VIAPPL game, showing how identity emerges over time in interaction.

High status groups show higher ingroup identification

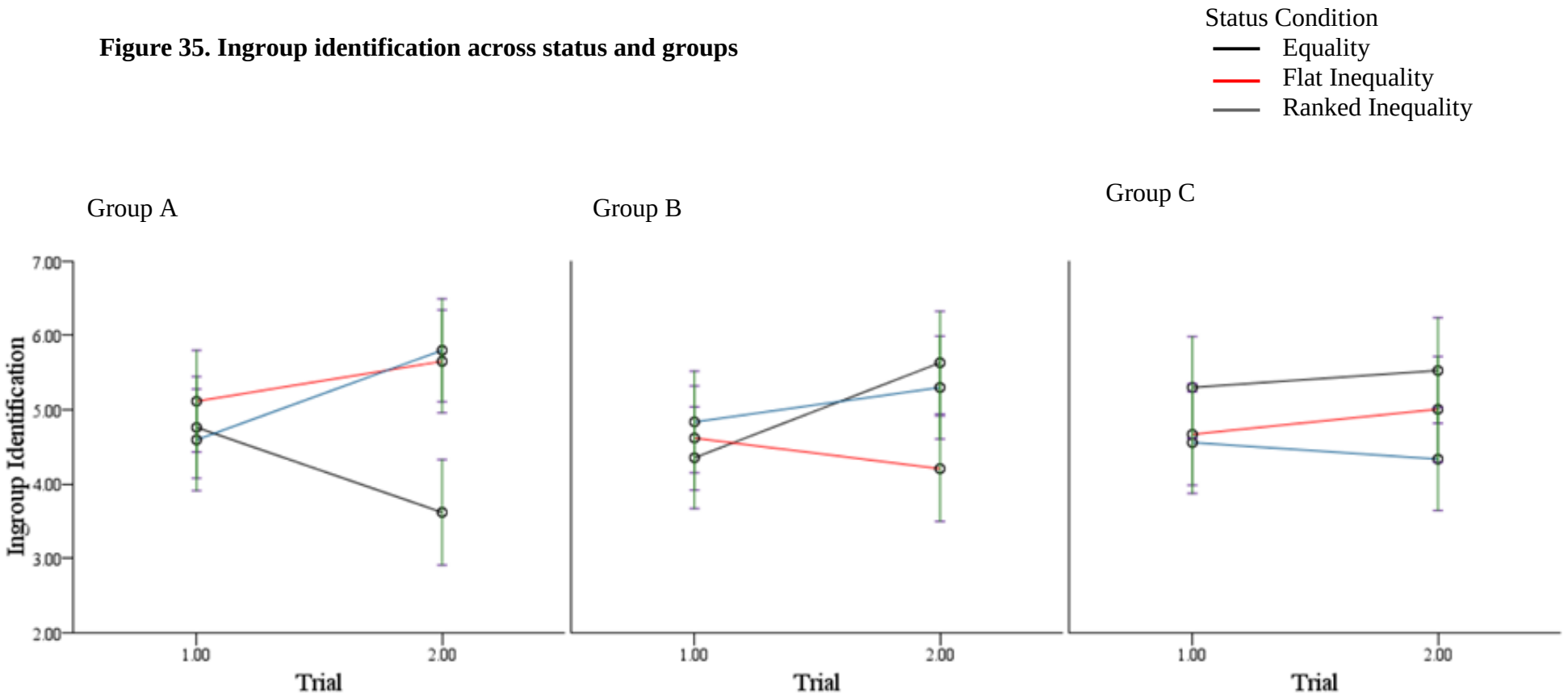
Specifically, Group A ($F(2, 301) = 11.587$; $p=0.000$) showed a significantly higher level of ingroup identification in the ranked inequality (M: 5.796, SE: 0.352; $\beta = 2.180$, SE=0.504, $p=0.000$) and flat inequality (M: 5.648, SE: 0.361; $\beta = 2.032$, SE=0.504, $p=0.000$) conditions compared to the equality condition (M: 3.167, SE: 0.361). Therefore when Group A was not privileged in the social hierarchy their level of ingroup identification was lower than when they were, showing that power obtained through unequal token distributions at the beginning of the game results in higher ingroup identification. This higher identification was not significantly different in the flat and ranked inequality conditions.

Low status groups show lower ingroup identification

There was also a significant difference in ingroup identification in trial 2 in Group B (which was the low status group in both the flat and ranked inequality condition) ($F(2, 301) = 4.349$; $p=0.014$). It appears that ingroup identification was significantly lower in the flat inequality condition (M:4.204, SE: 0.361) compared to the ranked inequality (M: 5.296, SE: 0.352; $\beta = -1.092$, SE=0.504, $p=0.031$) and equality (M:5.296, SE: 0.352; $\beta = -1.425$, SE=0.504, $p=0.005$) conditions. This is interesting as it suggests that it may be easier to identify with one's group if it is the lowest in the social hierarchy than just one of two low status groups. This appears to highlight the importance of group distinctiveness for one's group, even if the group is distinct in a negative way.

There was no significant difference in ingroup identification in Group C (which was the second low status group in the flat inequality condition and the middle status group in the ranked inequality condition) ($F(2, 301) = 2.816$; $p=0.061$).

Figure 35. Ingroup identification across status and groups



Superordinate identification

Superordinate identification aimed to measure whether groups shared a sense of identity with one another. The model for superordinate identification shows a significant interaction effect between trial and status condition ($F(2, 301) = 4.157$; $p=0.017$) and trial and group ($F(2, 301) = 4.175$; $p=0.016$).

In terms of the first interaction between trial and status, the differences in trial 2 only were significant ($F(2, 301) = 4.938$; $p=0.008$). Overall, superordinate identity is lowest in the flat inequality condition (M: 3.567, SE: 0.211) with it being significantly lower than the ranked inequality condition (M: 4.494, SE: 0.207; $\beta = 0.927$, SE=0.295, $p=0.002$) as well as lower, although not significantly so, than the equality condition (M:4.012, SE: 0.211).

The middle status group shows lower superordinate identification

With regards to the interaction between trial and group; in trial 2 there were significant differences between groups ($F(2, 301) = 4.938$; $p=0.008$), where Group C (equal, low and middle status group depending on the status manipulation) showed significantly lower superordinate identity (M: 3.449, SE: 0.211) compared to Group A (equal or high status group) (M: 4.226, SE: 0.209; $\beta = 0.777$, SE=0.296, $p=0.009$) and Group B (equal and low status group) (M: 4.398, SE: 0.209; $\beta = 0.949$, SE=0.296, $p=0.002$).

Therefore Group C seems to experience a drop in superordinate identity after being in the middle status group (compared to Group A and B). One could link this to the behavioural patterns of token allocations from the middle status group who shows outgroup giving to both the high and low status groups. By considering these findings together, one could argue that drop in superordinate identity in the middle status group occurs as a result of reaching out to both the high and low status groups (in the form of token allocations) but not getting a response from either. This will be explored more closely in the discussion. Unfortunately a lack of a significant three way interaction means that it is difficult to conclusively make this argument.

Figure 36. Trial and status interaction on superordinate identification

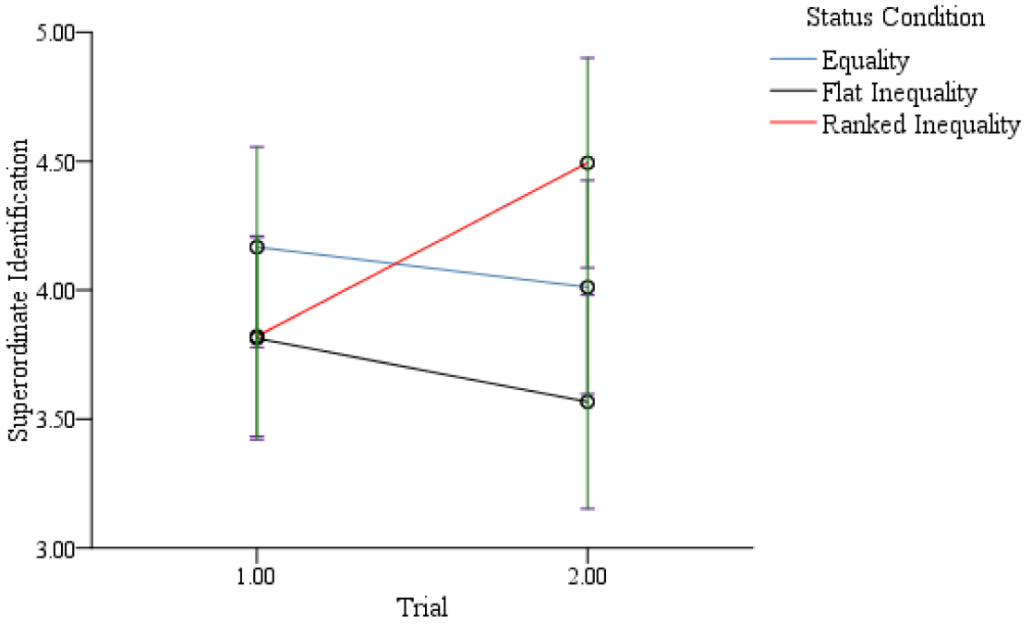
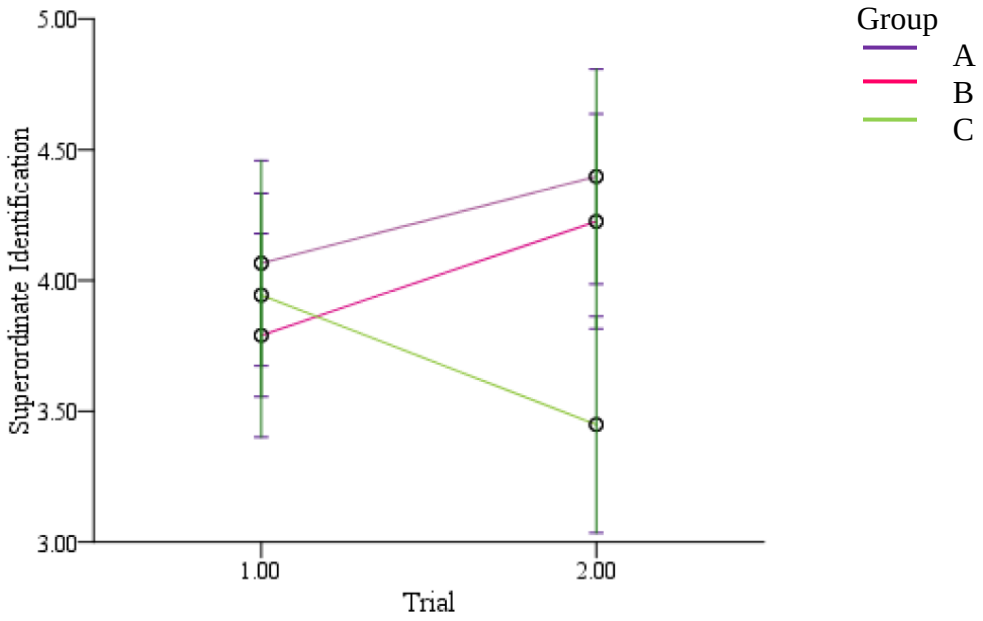


Figure 37. Trial and Group interaction on superordinate identification



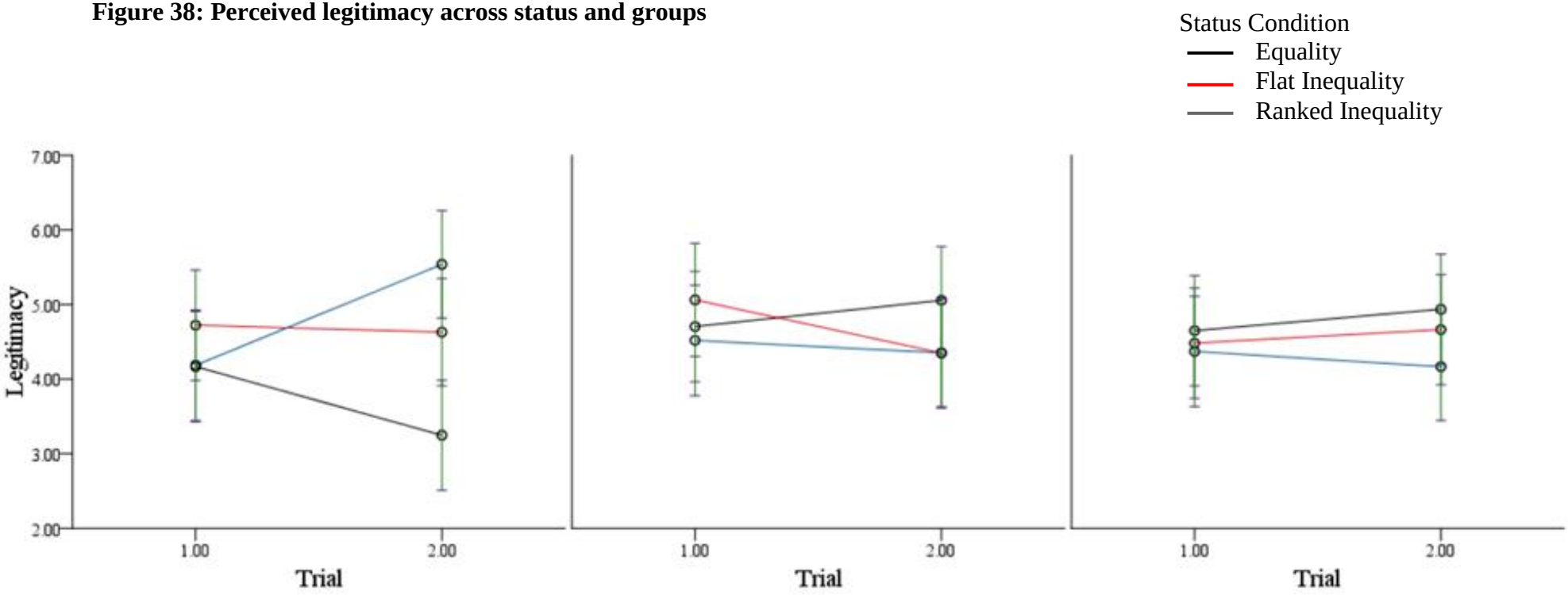
Legitimacy

The model for status legitimacy was used to measure whether the status of one's group (high, middle or low) affected whether or not one perceived the social hierarchy to be fair.

High status groups show higher levels of legitimacy

The generalized linear mixed model shows that there was a significant three way interaction between trial (see Figure 38), status condition and group in terms of perceived legitimacy ($F(4, 301) = 4.570$; $p=0.001$). This occurred in trial 2 only where Group A differed significantly depending on the status condition ($F(2, 301) = 9.655$; $p=0.000$). Specifically, compared to the equality condition (M:3.248, SE: 0.375), Group A had higher levels of perceived legitimacy in the ranked inequality condition (M:5.537, SE: 0.366; $\beta = 2.298$, SE=0.524, $p=0.000$) and the flat inequality condition (M: 4.630, SE: 0.366; $\beta = 1.382$, SE=0.524, $p=0.009$). As Group A was the high status group in both these conditions, it indicates that when a group is in a relatively higher position in a social hierarchy they are more likely to see this as legitimate and fair.

Figure 38: Perceived legitimacy across status and groups



Stability

Stability is the degree to which social change can be imagined. In other words, this model was used to measure whether participants believed group status could change over the course of the game. In terms of the GLMM for stability, it appears that there was a significant interaction between status and group ($F(4, 301) = 3.195$; $p=0.014$) such that for Group A ($F(2, 301) = 5.167$; $p=0.006$) (the high status group in both the inequality conditions) and Group C ($F(2, 301) = 3.095$; $p=0.047$) (the middle and low status group in the flat and ranked inequality condition respectively) there is a significant difference in their perceived stability depending on the status condition.

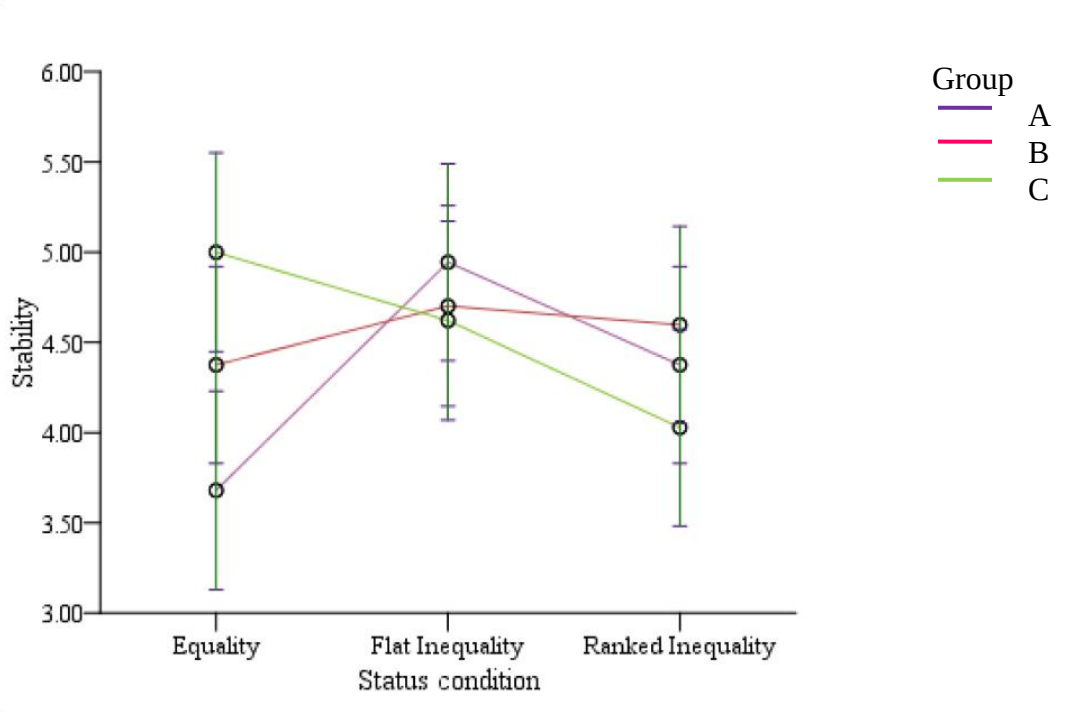
The high status group is likely to perceive instability

For Group A, compared to the equality condition (M: 3.680, SE: 0.280), there was a higher perception of stability in the flat inequality condition (M: 4.944, SE: 0.277; $\beta = 1.265$, SE=0.394, $p=0.001$) but no difference between the flat and ranked inequality condition (M: 4.375, SE: 0.277) or between the equality and ranked inequality condition. This seems to suggest that under conditions where the high status group has no direct competition (for example a middle status group who is more likely to 'overpower' them), they are less likely to perceive that a change could occur in the social hierarchy.

The middle status group is likely to perceive instability

For Group C, when in the ranked inequality condition as a middle status group, they were significantly more likely to perceive instability in the social order (M: 4.028, SE: 0.277) compared to the equality condition (M: 4.999, SE: 0.280) ($\beta = -0.971$, SE=0.394, $p=0.014$). There was no significant difference in the perception of stability in the equality or flat inequality condition (M: 4.621, SE: 0.280) or between the two inequality conditions.

Figure 39. Perceived stability between groups under different status conditions



Perceived ingroup competitiveness

Ingroup competitiveness measured whether participants saw their group as competitive or not. There was a significant three-way interaction between status, group and trial ($F(4, 301) = 4.188$; $p=0.003$). (see Figure 40) This interaction showed that there were no significant differences in the perception of one's own groups competitiveness in trial one (following the two practice rounds and before the beginning of the actual game). However, there were significant differences in perception of competition in trial 2. Specifically, the differences among Group A ($F(2, 301) = 6.497$; $p=0.002$) and Group C ($F(2, 301) = 5.559$; $p=0.004$) across the three status conditions were significant.

The high status group is likely to view their group as competitive

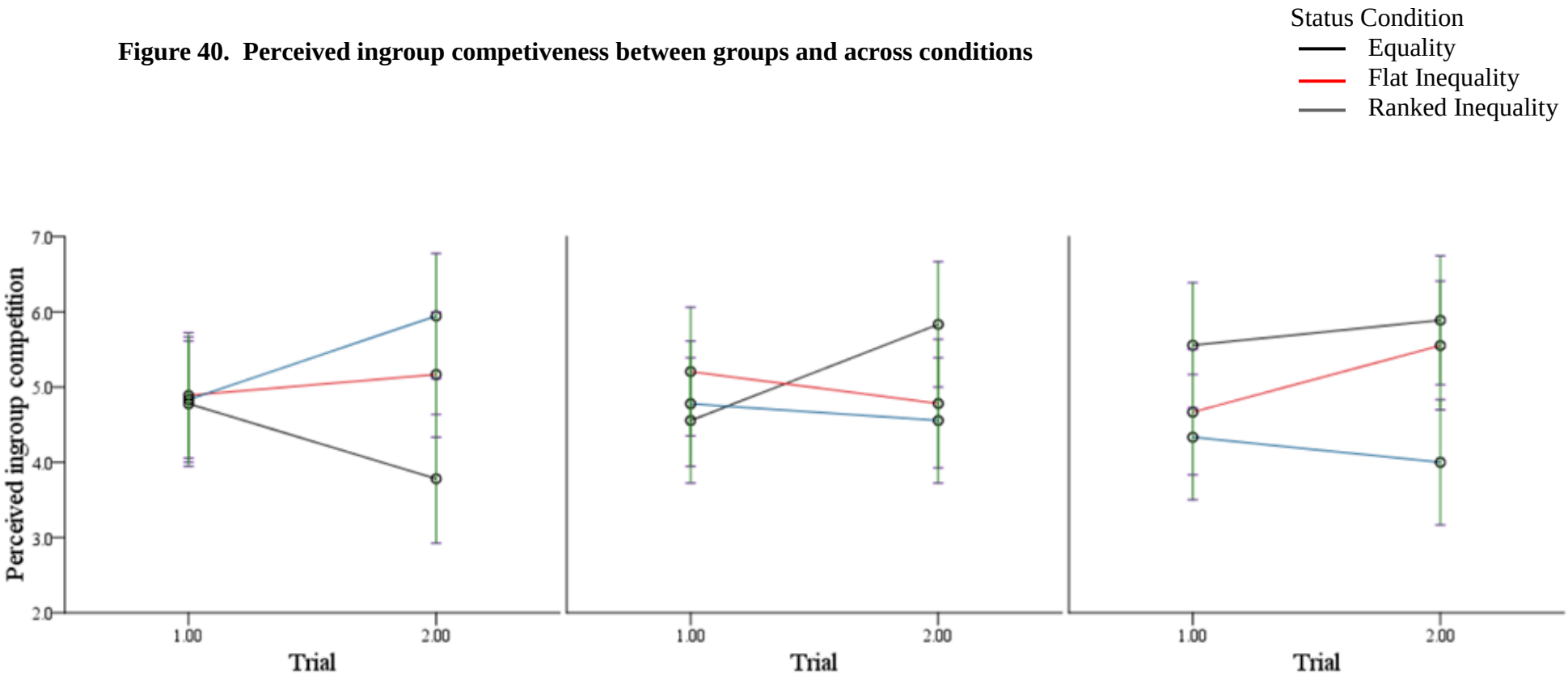
With regards to Group A, participants were more likely to perceive their group as competitive in the ranked (M: 5.944, SE: 0.423; $\beta = 2.163$, SE=0.607, $p=0.000$) and flat inequality (M: 5.167, SE: 0.432; $\beta = 1.386$, SE=0.607, $p=0.023$) conditions compared to the equality condition (M: 3.781, SE: 0.435), and there was no difference in perceived competition between the two inequality conditions. This means that when Group A is the high status group, they tend to perceive themselves as more competitive which seems to relate to the increased perception of legitimacy of the social order as well as higher ingroup identification.

The middle status group views their group as fair

Participants in Group C were significantly less likely to perceive competition in their group in the ranked inequality condition (M: 4, SE: 0.432) where they were the middle status group,

compared to the equality condition (M: 5.888, SE: 0.435; β = -1.888, SE=0.607, p=0.002) and the flat inequality condition (M: 5.553, SE: 0.435; β = -1.553, SE=0.607, p=0.011) and there was no significant difference between the latter two conditions. Therefore the middle status group was less likely to perceive their group as competitive and this seems to hold in their behaviour as the models for the behavioural data indicate that the middle status group was less likely to engage in ingroup bias over time but rather allocate tokens to both Group A and Group B in this condition

Figure 40. Perceived ingroup competiveness between groups and across conditions



Measuring Perceived intergroup alliance: Chi-Square, Cochrane's Q and Multinomial Logistic Regression

In addition to measuring social identity (both ingroup and superordinate) as well as sociostructural variables (legitimacy and stability), participants' perception of which alliances were most common was also measured. A generalized linear mixed model was not suited to the data for the measure of intergroup alliance perception, since it was measured on a nominal scale. Therefore a chi-square was performed independently for trial 1 and trial 2 and Cochrane's Q test was performed to show change between them. This was followed by a multinomial logistic regression for the trial 2 data in order to see how perceptions of alliance differed according to the status condition.

Perception of alliances develop over time

For trial 1, the Chi-Square test indicated that there is no significant association in alliance perception in the status conditions (χ^2=8.104, φ=0.226, p=0.423), naturally, as there is not much of an opportunity over 2 rounds to see the formation of intergroup alliances or for these alliances even to form. In trial 2, however, there is a significant association in alliance perception among the status conditions (χ^2=18.255, φ=0.340, p=0.019), this was further analysed through running a multinomial logistic regression model which will be reported below. The results of Cochran's Q test comparing perceived intergroup alliance between trial 1 and 2 showed that there was a significant difference in participants responses over time (Q: 13.989 > χ^2: 3.482, df =1, p=0.05) indicating a significant change in perception of alliance from the beginning to the end of the actual game (trial 2). This shows that participants were more likely to perceive alliances forming over time in interaction.

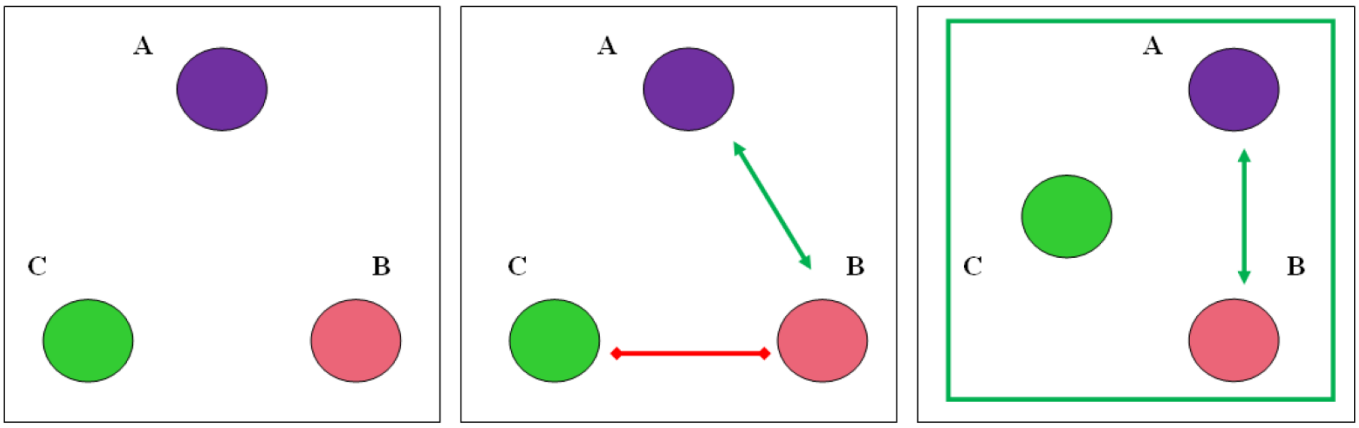
The divergence between alliance perception and social reality

In order to further explore where the significant differences in alliance perception occurred depending on the status condition in trial 2, as suggested by the first chi-squared test, a multinomial logistic regression model was run on the trial 2 data. No perceived alliance (one of the options for participants to choose from) acted as the reference category. The results indicate that compared to no perceived alliance there was a significantly lower perception of an intergroup alliance between Groups A and B in the equality compared to the ranked inequality condition (β =-1.872, SE=0.894, p=0.036). This provides more evidence for a divergence between perception and reality as the exact opposite of this alliance occurred in reality. In the equality condition, Group A to B had the strongest alliance while in the ranked inequality condition, they had the weakest alliance.

There was no significant difference in the perceived alliance between Groups A and C compared to no perceived alliances. However there was a significant difference in perceived alliance between Groups B and C compared to no perceived alliances. Participants in the flat inequality condition showed a lower perception of a BC alliance than the ranked inequality condition (β =-2.592, SE=0.890, p=0.004).

Finally, compared to no alliance, there was a lower perception of three-group (full) cooperation/alliance in the equality and flat inequality condition compared to the ranked inequality condition (Equality: β =-2.197, SE=0.955, p=0.021, Flat Inequality: β =-2.909, SE=1.012, p=0.004). This may be due to the fact that Group C, the middle status group, had lower ingroup bias in this condition and gave tokens to both Group A and Group B (although more so to the latter), thus being the 'middle man' between these groups could have increased the perception of full cooperation in this setting of inequality even though there was a significant lack of alliance between the low and high status group.

Figure 41 Perceived alliances at Trial 2



Note: The red line indicates lack of perceived alliance while the green arrows represent perceived alliance.

Figure 41 clarifies the above reported results, clearly showing that first, participants were significantly more likely to perceive full intergroup cooperation or alliance in the ranked inequality compared to the equality and flat inequality conditions. Secondly, an alliance between Group A (high status) and B (low status in both instances) was more likely to be perceived in the inequality conditions compared to the equality condition. Third, an alliance between Group C and B was significantly less likely to be perceived in the flat (where they are both equally low status groups) compared to ranked inequality and equality conditions. Finally, there was no significant difference in perceived alliance between Group A and C in the ranked inequality (that is, between the high and middle status groups) conditions compared to the other two conditions.

Group membership does not determine alliance perception

An additional Chi-Square test indicated that there was no significant difference in alliance perception among the groups in either trial 1(χ^2=14.361, φ=0.301, p=0.073) or in trial 2 (χ^2=13.657, φ=0.294, p=0.091). The results of Cochrane's Q test show that there was no significant difference in participants responses from trial 1 to trial 2 (Q: 0.074 > χ^2: 3.482, df =1, p=0.05) either. Therefore we can conclude that the perception of alliance does not depend on

which group (low, middle, high status) one belongs to and this is true at the beginning as well as the end of the game.

Chapter 6: Discussion

This thesis began with a critique of the dominant two-group paradigm in social psychological research which has become the central social metaphor through which to understand intergroup behaviour. In considering settings of inequality, this often means that the role of a middle status group is neglected. In addition to this limiting two-group paradigm, research has traditionally failed to account for the effect of interaction in the contestation and development of groupness, social identity and alliances in the evolution social change. This results in a conformity bias view of social psychology which sees human beings as 'puppets' on the social stage who are shaped by their environment rather than as agents who possess the power to exert influence on the social setting.

One of the seminal experiments in social psychology, the minimal group studies, were limited in the above two respects. Therefore the aim of this research was to re-imagine the minimal group paradigm in a way that can further extend the vibrant experimental tradition in social psychology. To do this a novel experimental platform – the Virtual Interaction Application – was used; in which participants are afforded the agency to interact over time, and are both shaping and being shaped by the social context. The broad goal of this research was to explore the results of these interactions, under different social hierarchies.

This chapter aims to describe how the present research has explored possibilities for studying social psychological phenomena in a unique way, specifically addressing how these findings add to the current body of knowledge in the field of social identity and intergroup relations. Suggestions for future research, paying particular attention to considering multigroup settings, will be presented in more detail; along with the limitations of the present study.

Ingroup bias

Overall, ingroup bias remains strong in the three-group paradigm

This research aimed at extending the minimal group paradigm, and in doing so has provided valuable support for the key finding of the original studies – namely that categorization into arbitrary groups results in consistent ingroup bias on the part of group members.

In the original minimal group studies, Tajfel et al. (1971) found that ingroup members tended to maximize the difference in point allocation between the ingroup and outgroup (even at the expense of maximizing the ingroup's overall profit). Through ingroup bias, positive distinctiveness between the groups is created, thereby serving to improve the social identity of the ingroup and the related self-esteem tied to that group membership. However, Harstone and Augostinos (1995) argued that the two-group paradigm employed in the original studies, as well as most of the replications which followed, increased the salience of intergroup competition. Therefore, they argued, the antagonistic 'us versus them' dynamic of the experimental context actually inflated ingroup bias. They predicted, and found support for this argument in studies they conducted in a three group setting. However, what both the original two-group studies and

the three-group studies lacked was interaction among participants, a key factor in the evolution of intergroup behaviour.

The present research was conducted in a three-group setting where participants were afforded the opportunity to interact over time. The latter aspect of the design allowed for groupness to strengthen or weaken over the course of the game as well as gave participants the agency to create and reinforce, or avoid and reduce, social ties both within and between groups. Overall, the present research shows that ingroup bias remained a consistent behavioural trend even with these extensions and furthermore, that affording groups the option to form intergroup alliances and solidarities does not reduce this bias. In fact, there were no notable reciprocal intergroup alliances that occurred at all in any of the games, in any of the social hierarchies. Therefore, even in a three-group setting, ingroup bias and intergroup competition remains strong.

The fact that this seems to contradict the findings of Harstone and Augostinos's (1995) studies may have to do with the inclusion of interaction over time, which their studies lacked. Therefore affording participants the opportunity to influence, and be influenced by, other social actors in the social hierarchy allowed for the norm of ingroup bias to develop. This is supported by the finding that ingroup bias increased over the course of the experiments (except for the middle status group in the ranked inequality condition – which will be discussed later on in the chapter). Whereas it may be true that structurally speaking, a three group setting reduces the effect of stark intergroup competition and therefore ingroup bias, it does not eliminate it. Rather, by allowing interaction to occur over time, the norm of ingroup bias, which may start off slightly weaker compared to the two-group setting, can develop and strengthen. Therefore, a three-group setting may simply slow ingroup bias down in comparison to a two-group setting.

Furthermore, the VIAPPL method used in this study allowed for the comparison of different status structures (namely: equality, flat inequality and ranked inequality). The findings made it clear that these different structures appear to prompt different norms, including norms for ingroup bias. In particular, in the ranked inequality condition, ingroup bias decelerated over time for the middles status group. This will be discussed further in the following sections.

Weakening ingroup bias shown by the middle status group only

As we have seen, ingroup bias was found to be a powerful trend in the current experiments even with the extensions to the minimal group studies, thus supporting and elaborating on, the original findings. However, this research can also further add to these findings by discovering a context in which this ingroup bias begins to break down, or at least weaken.

The middle status group, a group 'caught in between' two others, experienced a slower rate of ingroup bias over time – this is a finding in experimental social psychology that has not been visibly explored before (at least not that I am aware of). Furthermore, there was no difference in ingroup bias between the high and the low status group in the ranked inequality setting where the middle status group was introduced. In other words, for both these groups, ingroup bias increased over time at the same rate. As there is very little research on intergroup relations and ingroup bias in multigroup settings that include a middle status group in general, there is necessarily some speculation involved in understanding this phenomenon.

Middle versus high and low status groups: An overview of similarities and differences

In order to understand why ingroup bias in the middle status group operated differently it is helpful to consider the additional findings related to this group: 1) overall, they tended to allocate tokens equally to both the high and low status group; 2) they were significantly more likely to perceive instability in the ranked social hierarchy compared to other conditions and 3) they showed lower levels of superordinate identification after the game. Furthermore, the middle status group did not show higher levels of ingroup identification nor were they more likely to perceive illegitimacy in the social hierarchy.

Considering these findings in light of the low and high status groups' behaviour and psychological experience may also be useful to begin to develop a theoretical explanation for these findings. The key findings of the study will be briefly introduced and summarized here before being explored in greater detail later on in the chapter.

While the middle status group gave equally to the high and low status group, there was a notable avoidance of token allocation between the high and low status group. Furthermore, like the middle status group, the low status group did not show a stronger ingroup identification, however the high status group did. Although neither the low status nor middle status group had a stronger sense of legitimacy of the social inequality, the high status group did in fact find the social setting to be legitimate. In addition, like the middle status group, the high status group was more likely to perceive social instability, yet the low status group was not. Finally, both the low status group and the high status group showed similar levels of superordinate identification which appeared to be higher than that experienced by the middle status group.

As we can see the middle status group shared some similarities with both the high and low status groups. On one hand, both the middle and low status group had similarly lower levels of ingroup identification and legitimacy compared to the high status group while on the other hand, both the middle and high status group had higher levels of perceived instability compared to the low status group. In addition to the similarities between the middle status group with each of the other two groups, the high status and low status group also shared similarities – they both had faster rates of ingroup bias compared to the middle status group and they both had higher levels of superordinate identification compared to the middle status group. These similarities and differences between groups and their potentially different motivations for behaviour can be explored by drawing on the literature related to the social identity perspective as well as that related to the middle class.

For the sake of clarity, the three groups will be discussed simultaneously according to each particular phenomenon, namely: ingroup bias and intergroup alliances or competitions; ingroup identification; legitimacy; social stability and superordinate identity. Finally a possible explanation for the slower rate of ingroup bias in the middle status group will be introduced as an avenue for potential future exploration.

A faster rate of ingroup bias for the high and low status group compared to the middle status group

The existing literature, which compares high and low status groups in the dominant two-group paradigm, predicts that the high status group will show higher levels of ingroup bias than the low status group (Bettencourt et al., 2001). Although low status groups tend to show greater outgroup giving in certain social settings, this seems to occur only when there is a chance for a low status group member to 'rise' socially; that is, there is group boundary permeability which allows for the social mobility of individual group members (Ellemers et al., 1993). The manner in which the present study was conducted precluded the possibility of changing group membership and thus social mobility for the low status group members (or for any participants for that matter) was not an option. As there was no significant difference in ingroup bias between the high and low status groups and both showed a faster rate of ingroup bias compared to the middle status group, the literature on the effect of permeability on intergroup behaviour was supported by the present research.

Since the literature regarding the high and low status groups has not considered settings with a middle status group, no predictions for ingroup bias in middle-status groups can be made. Although it makes some sense that, like the low status group, the middle status group might show higher ingroup bias where group boundaries are impermeable, there is no experimental supporting evidence for this. However, research into the middle class suggests that they are self-interested and likely to engage in collective ingroup solidarity (Lawson, 2012; Maavak, 2010) and therefore one may assume that a middle status group would also show high levels of ingroup bias. However, this did not occur in the present research, in fact, ingroup bias slowed down over time. Why the middle status group showed a slower rate of ingroup bias will be explored tentatively throughout the chapter.

Patterns of intergroup alliances and competition

Intergroup competition between the high and low status group

The high and low status group showed similarly high levels of ingroup bias compared to the middle status group. In terms of their patterns of outward giving, they showed a strong avoidance for allocating tokens to one another suggesting intergroup competition between the high and low status group. One may argue that ingroup bias and intergroup competition are indistinguishable in the VIAPPL environment as participants could only either give to the ingroup or an outgroup at each round. However, because there was more than one outgroup in this intergroup setting, choosing to avoid one group over the other suggests differential treatment of groups which may hint toward intergroup competition. In other words, the fact that this 'token avoidance' between the high and low status group did not exist with the middle status group suggests that there is intergroup competition between the high and low status group.

It was evident that an intergroup alliance between the high and low status group which excluded the middle status group was the least likely alliance to occur in the social hierarchy. Furthermore, neither group showed a strong tendency to form ties with the middle status group, although the avoidance of the middle status group was not as strong.

On one hand, since there was no possibility for leaving their group, the low status group members' only option to improve their social status would be to engage in social competition with the high status group (as suggested by the literature (Bettencourt et al., 2001)); therefore avoiding bolstering the high status group's superiority (through token allocations) would be in their best interest. This may also apply to the lack of a strong alliance to the middle status group too. On the other hand, the high status group's high ingroup bias can be explained by their desire to maintain their social position. As the maintenance of the status quo (which supports positive group distinctiveness) would best serve their interests in terms of positive social identity and self-esteem (Hogg & Mullin, 1999 as cited in Bettencourt et al., 2001), it is understandable why they would avoid giving their resources away to the low status group, or to the middle status group for that matter.

Lack of alliance between low status groups against the high status group

This research also demonstrates how in this setting low status groups were not any more likely to try to form an intergroup alliance with another low (or middle) status group in conditions of inequality. The models of Politicised Collective Identity (Simon & Klandermans, 2001) and Political Solidarity (Subašić et al., 2008) suggest that low status groups, in an attempt to challenge the status quo, would be particularly motivated to recruit a third group into their social competition with the high status group. In this experimental setting, the only way to achieve this would be to allocate more tokens to another low status group in the hopes that this group would reciprocate and an alliance would be built that threatens the relative advantage of the high status group. Ingroup bias remained strong in the low status groups which prevented the formation of an intergroup alliance against the high status group. Perhaps the low status group did not wish to risk what limited resources they had by allocating tokens to another low status group, in the event that this is not reciprocated. This may suggest the need for some sort of initiating event to occur (which establishes social trust – through evidence of reciprocation for example) resulting in positive intergroup contact between low status groups which could then develop over time into an intergroup alliance which excludes the high status group.

Middle status, unidirectional alliances with both the high and low status group

While the high and low status group notably avoided allocating tokens to each other and engaged in high ingroup bias, the middle status group was found to allocate tokens roughly equally between the low and high status group. This pattern of outward giving, combined with a slower rate of ingroup giving can potentially be understood in at least two ways. First, the middle status group may be a fairer group that attempts not to show favouritism to either the low or high status group, while also tempering their own ingroup bias. Second, the middle status group may be attempting to 'manage' the intergroup setting in a way which maintains or even improves their social position (although, if this is the case, the strategy was ultimately unsuccessful). Alternatively, this may not be an either/or situation but both motivations may create a social dilemma for the middle status group. The pattern of allocating tokens to both the high and low status group perhaps suggests that the middle status group is acting as a 'bridge' between the two other groups – in other words, this group is connecting the two groups through token allocations. This will be explored in greater detail later on in the discussion.

Lack of bidirectional, reciprocated intergroup alliances

The patterns of outgroup giving did not show *any* bidirectional intergroup alliances developing over the course of the experiments. This was probably due to the strong trend for ingroup bias and also suggests that there was something missing from this minimal experimental context which does not support the development of intergroup alliances. Thus a setting of social inequality with three distinct groups of different status may be a necessary but certainly not sufficient, condition for intergroup alliances to form.

Ingroup identification is influenced by group status

Higher status results in higher ingroup identification

The results of the present experiment show how group status influences the strength of ingroup identification. The high status group was shown to have a stronger ingroup identity. The fact that the high status group appeared to be more strongly identified with their group is a phenomenon already established in the literature (Bettencourt et al., 2001). This higher identification with the group occurs because, according to the social identity perspective (Tajfel & Turner, 1979), while engaging in comparisons inferior groups, the high status group will experience a positive group distinctiveness thereby enhancing their identity as a group as well as their self-esteem.

As discussed earlier, like the high status group, the low status group showed increasing ingroup bias over the course of the games, however, they did not share the same strong sense of ingroup identity. In fact, in the ranked inequality condition, the low status group showed the weakest ingroup identification. This suggests that ingroup bias and ingroup identification are not necessarily related. Therefore, status seems to play a crucial role in the formation of a strong ingroup identification, which is supported by the literature on status differences. This literature explains these differences between low and high status groups in terms of perceived status legitimacy and stability (Ellemers et al., 1993; Bettencourt et al., 2001), which will be further discussed in the following sections when looking at these constructs as they relate to the present study.

The middle status group experiences 'low status levels' of ingroup identification

Like the low status group, the middle status group reported a weaker ingroup identity compared to the high status group. Unfortunately, this cannot be not be explicitly explained by the current literature as there little research on the middle status group due to the dominant two-group paradigm in social psychology. Arguably though, the middle status groups' strength of ingroup identity would depend on which group they were to compare themselves to. If they were to engage in an upward comparison (that is, compare themselves to the high status group) their identity may be low; while by using downward comparison (with the low status group) their ingroup identity may be high; and if they made a simultaneous comparison their identity may be ambivalent. This was not accounted for in the presented study. It may be the case that in some ways the middle status group is similar to the low status group – in that they do not show strong ingroup identity compared to the high status group (nor does either show high legitimacy like the high status group does – to be discussed in the next section).

How an imposed social structure can influence perceptions of legitimacy over time

A lower status results in lower sense of legitimacy

As discussed in the previous section, both the low and middle status groups had a weaker sense of ingroup identification compared to the high status group. They also shared a weaker sense of legitimacy of the social structure compared to the high status group. A sense of whether a social situation is legitimate or not, relates to the extent to which it is viewed as the outcome of a just procedure (Ellemers et al., 1993).
According to the literature as it relates to low status groups (and possibly to middle status groups in light of the findings of this research), ingroup identification is stronger when the social setting is viewed as illegitimate (Ellemers et al., 1993) However, in this experimental context, a lower sense of legitimacy did not appear to enhance ingroup identification.

Legitimising beliefs for high status groups

In this study, the high status group had a stronger sense of legitimacy of their status compared to the low and middle status groups. Therefore the findings of the present study supports the social identity perspective (Tajfel & Turner, 1979) which suggests that the high status group tends to have a greater sense of legitimacy regarding an unequal social structure in which they are on top. By viewing their privilege as somehow justly deserved this increases the social identity and self-esteem of the high status group even more than the mere status difference. A sense of status legitimacy also provides justification for accepting the status quo. If the high status group were to attempt to try to create social equality between groups it would result in the loss of positive distinctiveness that comes with the relative privilege. Therefore, the perception of legitimacy serves to bolster social identity (and self-esteem) as well as maintain the relative material advantage of the high status group. This is line with the findings that the high status group had a stronger ingroup identification than groups of lower status, as discussed above; which also supports the literature that predicts that greater legitimacy will result in high ingroup identification for high status groups (and lower ingroup identification for low status groups) (Bettencourt et al., 2001).

Perceived social stability of the social hierarchy

Low status groups are less likely to imagine social change

This study showed how belonging to the high status and the middle status group appeared to increase the awareness of the instability of the social hierarchy. This perception was not reported by the low status group. Furthermore this perceived instability did not change over time; rather, simply being introduced to the social structure, and one's group's position, resulted in a perception of instability for these two groups. For the high status group, potential for social change (in the form of the redistribution of tokens) could only have meant that they could lose their relative advantage possibly resulting in feeling threatened or insecure. For the middle status group social change could have meant that 1) they may improve their social position or 2) they may fall down in the social hierarchy. In terms of the low status group, it seems that they were

not optimistic that their position in the hierarchy would improve as they did not hold the same perception of instability of the social hierarchy.

Could perceived social stability and instability moderate the effect of ingroup identity?

The fact that the high status group showed high perceptions of instability seems to be consistent with the higher levels of legitimacy and ingroup identification. Under conditions of perceived instability, the high status group has a greater awareness that their economic security is threatened and therefore will become even more motivated to attempt to secure their position in the social hierarchy (Hogg & Mullin, 1999 as cited in Bettencourt et al., 2001), opposing social change (Klandermans & Simon, 2001). It has been shown that instability could moderate the effects of legitimacy on ingroup identification in low status groups and perhaps this could be applied to high status groups. A sense of illegitimacy is argued to increase ingroup identification for low status groups when the social structure is perceived as unstable and open to change (Ellemers et al., 1993). Therefore it is evident that the interaction effect between legitimacy and stability on ingroup identification could apply to the high status group by enhancing ingroup identity. This was not directly studied in the present research and is a post hoc explanation at this point which would require future research.

Although perceptions of instability may influence the formation or strength of ingroup identity, some lines of research indicate that perceptions of status stability do not affect levels of ingroup bias (Ellemers et al., 1993). Therefore this may explain why even though both the high and middle status group perceives instability; it does not result in the same development of ingroup bias as ingroup bias increases for the former group and slows down for the latter.

Extending ingroup identity to include an outgroup

How receiving tokens may increase levels of superordinate identity for the high and low status groups

The low and high status group showed similarly higher levels of superordinate identification with other groups in the social setting compared to the middle status group. Notably, as we have already seen, these two groups particularly avoided forming an intergroup alliance, seemingly engaging in intergroup competition. Therefore their superordinate identification may be related to the middle status group and not one other. Superordinate identity, on the part of both of these groups, may have been formed with middle status group and not one another. This may have been due to the fact that the middle status group showed less ingroup bias and allocated their tokens fairly equally between the low and high status group. The fact that the latter groups were on the receiving end of the middle status token allocations could have resulted in increased identification with the middle status group. This argument is somewhat speculative however, as the measure used in this study did not differentiate superordinate identification with one group over the other. In other words, the superordinate identity items did not measure identification between high and low, high and middle or high and low separately.

Lower levels of superordinate identity experienced by the middle status group despite higher outgroup giving

Despite showing a slower rate of ingroup bias and by giving equally to both the high and low status group, the middle status group experienced significantly lower levels of superordinate identity. This seems to provide some support to the argument that this pattern of behaviour may not simply be attributable to the middle status group's tendency toward fairness. This seems to suggest that an increase in outgroup giving (by 'sacrificing' ingroup giving and risking the ingroup's resources) is not related to an increased identification (or solidarity) with other groups or a desire to create social change in terms of more equitable token distribution. This seems to support to the argument that the middle status group, by *appearing* fair to both the low and high status group, was actually motivated to act in self-interested ways that in fact excluded the other groups. Therefore intergroup solidarity on the part of the middle status group may actually be considered to be unlikely if one takes into consideration the *motivation* for giving to the outgroup, as well as the effect this has on the maintenance of the status quo – and even the possible rise in status – that may result if their allocations are reciprocated by both groups. An important caveat to note however is that although the middle status group did report lower superordinate identification, so did the other "Group C's" in the equality and flat inequality condition (where this group was similarly positioned on screen but was an equal status group and a second low status group respectively). This may have to do with a lack of statistical power to show a possible three-way interaction and therefore perhaps more replications of the studies would be needed to clarify this and explain why these groups showed lower superordinate identity.

A social dilemma for the middle status group

Fairness versus strategic self-interest?

The middle status group in this experimental context is outward reaching, extending resources to both the low status group and high status group, while having a slower rate of ingroup bias. In other words, it can be argued that the middle status group appears to show a tendency to occupy the structural hole/lack of connection between the high and low status group (which is indicated by the intergroup competition between them as discussed previously). While this could be attributable to a greater sense of fairness as a result of being 'caught in the middle' of two groups, it may also be likely that the middle status group may actually be strategically managing their position in the middle in order to maintain the status quo or in fact improve their social position.

The research on bridging in social networks (see for example: Burt, 2000; Kalish, 2008) appears to support the above possible explanations for the pattern of behaviour exhibited by the middle status group. The literature on bridging postulates that motivations for occupying a structural hole may be divided into two categories (Kalish, 2008). The first is a relationship-building motivation which aims to create unity among the triad (or in this case the three groups) which may be related to altruism and fairness. The second motive is entrepreneurial and egocentric, related to gaining power; thus it can be related to the strategic management strategy proposed above.

Alternatively it may be a combination of both motivations, therefore being "caught in the middle" of two groups may result in a social dilemma for the middle status group as they try to juggle fairness and self-interest. Of course, with the limited theory on a middle status group due to the dominant two-group paradigm that exists in social psychology, the potential explanation for the present study's findings related to the middle status group is necessarily speculative. Research on bridging does not, as of yet, provide any clues into which motivation is most likely for middle status group in this context as much of the existing research is focused on the psychological characteristics of *individuals* who occupy this position (see for example: Kalish, 2008), which was not measured in the present study.

Strategic management of the intergroup setting

Understanding the motivations of the middle status group in the current research may be helped further by research and theory around the middle class. The existing literature on the middle class primarily depicts them as a self-interested group that is guided by a fear of falling down the rungs of the social hierarchy (see for example, Lawson, 2012). This line of research into the middle class does not suggest that they have a tendency toward being a fairer, more socially just group, in fact they mostly seem to politicize as a group (and not *with* other groups) when they are directly negatively affected by a social situation (Maavak, 2010). While it could be argued that the fear of losing their relatively comfortable position in the social hierarchy may only be related to group boundary permeability (Tajfel & Turner, 1979), that is, when individual group members fall into the low status group; the notion of the 'fear of falling' may be extended to include socially unstable settings thereby relating to the vulnerability of a group as a whole. In other words, in situations where social instability exists, it is possible for the group as a whole to change positions with another group in the hierarchy in such a way that they 'fall' below the level (or at least, to the level) of a low status group, especially in the context of the present experiments.

The present study in fact found that the middle status group is very likely to perceive instability in the social hierarchy. Perceiving instability – or that the social order may change – allows the middle status group to imagine one of two possibilities: 1) that they may be able to improve their social position or 2) that they may lose their relative privilege. While it is under debate whether status stability would directly affect ingroup bias, it may nevertheless influence the middle status group.

Improving their privilege would have obvious benefits for the social identity of the middle status group and, arguably, this would be the ideal outcome especially as the ingroup identification of the middle status group was lower than the high status group (and similarly as low as the low status group). However, maintaining the status quo would also be in their interests if the former outcome failed to occur. In terms of the social identity perspective (Tajfel & Turner, 1979), the aspect of the theory related to social creativity may provide an explanation for the middle status groups' potential desire to maintain the status quo. This literature argues that when engaged in comparisons with a high status group, the social identity and self-esteem of the relatively inferior group is threatened. One of the options that this group has is to find another group (a third group) with which to compare themselves. By changing their comparison group from the high status group to a relatively disadvantaged group they can establish and maintain a positive social identity (and high self-esteem).

Following this line of argument, if the middle status group were to lose their relatively privileged position in the social hierarchy, they would consequently lose their downward comparison group (that is, the low status group). This would further negatively affect their social identity and self-esteem as they could only then engage in social comparisons with a superior group. Therefore, it is in the interests of the middle status group to keep the low status group in its relatively disadvantaged position, thus maintaining the status quo. The literature on the middle class seems to support the above argument. In order to prevent losing their position in the social hierarchy, the middle class are likely to engage in defensive strategies against the low status group in order to prevent members of their ingroup from falling into this group (Lawson, 2012) or, as could also be argued, prevent the group falling as a whole. These strategies, in turn, further oppress low status groups by keeping them in their relatively disadvantaged position and thus the status quo is maintained. However, in this study, the middle status group showed a consistent tendency to allocate tokens to the low status group which seems to disconfirm this theory. The motivation behind the middle status group in this study to show a strong tendency to allocate tokens to the low status group is therefore under question.

That the middle status group equally allocated tokens to the low status group, may be conceived as counter-productive to keeping the low status group at the bottom of the social hierarchy. This may not strictly be the case though as recent literature has shown that positive intergroup contact between advantaged and disadvantaged groups may actually lead to the maintenance of the status quo rather than inspire social change (Dixon et al., 2010). This is the result of a potential reduction of the perceived discrimination of the higher status group (the middle status group) as well as any sense of injustice of the current social hierarchy on the part of the low status group, which are arguably necessary components for social change to occur.

Now, whether the middle status group has an explicit awareness of the status quo-maintaining power of positive intergroup contact is doubtful, there may be an underlying common sense understanding of this. If the middle status group was motivated to topple the social hierarchy in an altruistic attempt to help the low status group they would not continue to increase the power of the high status group by handing away their precious resources to them. It would seem more likely that they would form an alliance with the low status group against the high status group – which did not occur. Therefore the potential reason behind allocating tokens to both the high and low status group, is that the middle status group may construct themselves as potential allies for both of these groups through positive intergroup contact, even if this intergroup contact is self-interested. This may increase their chances of gaining tokens from both these groups if they were to reciprocate which in turn may increase their likelihood of improving their social position while also ensuring that at the very least, they will maintain their position in the social hierarchy. This can be seen in light of the literature on bridging in social networks which argues that individuals or groups who are better connected (that is, have a relationship with both sides) experience greater returns (Burt, 2000) – therefore occupying a connecting position between two groups is potentially highly beneficial. Of course, in the context of this study, these relationships (ties to both the high and low status group) were not reciprocated so in fact these 'returns' (in the form of tokens) were not realized.

By showing evidence of the behavioural component of solidarity towards both groups (through outgroup giving) but not the social psychological component (superordinate identity) it seems that the middle status group is strategically managing their position in the hierarchy by either improving it; or at least not 'falling'. This risky strategy involves gambling their resources in the hopes that this will be reciprocated on both ends – by the high and low status group. The reason that this strategy can be viewed as potentially risky is that there is no guarantee that either group will reciprocate the resources which the middle status group is giving up. In fact, there is evidence that the high and low status groups did not reciprocate these allocations and therefore the middle status group did indeed lose tokens this way.

Why does the middle status increase the token allocation to the high status group over time?

However, the above proposed management strategy may not be a simple one. It appears complicated by the fact that while ingroup bias had a slower rate of increase over time, allocating tokens to the high status group increased steadily over time. Therefore these two behavioural phenomena are likely related. In other words the middle status group reduced their ingroup bias in order to give to the high status group, while still maintaining the same ties with the low status group.

A possible reason for starting to increase tokens to the high status group could be due the lack of reciprocation from the low status group, who showed increasing ingroup bias and no strong tendency to give to the middle status group. While the middle status group may have begun the game with fairness in mind (intergroup alliance with the low status group against the high status group) this may have changed over the course of the game if they came to realize that they were giving away their resources without receiving anything in return; which could have resulted in a drop in the social hierarchy. This may have led to increasing allocations to the high status group, thereby sacrificing ingroup bias. However, the rate of tokens to the low status group did not change. The possible reason for not stopping allocations to the low status group when they failed to reciprocate and instead giving up ingroup bias could be because of the development of the above proposed 'management strategy' for trying to receive tokens from both sides. Again, it must be noted that this explanation is highly speculative and post hoc in nature and future research is required to further explore this possibility.

The possible role of fairness and charity

Alternatively, perhaps the middle status group, being 'caught in the middle', had competing motivations for fairness on one hand, and self-interest on the other. Relationship-building motives for bridging two groups (Kalish, 2008) – in this instance the high and low status group – may be related to a sense of fairness. If this were the case then ingroup gain is sacrificed for collective gain and conflict resolution (through easing the intergroup competition that was shown to exist between the high and low status groups). In addition, this possible tendency toward fairness may also be supported by literature which shows that the middle class occasionally lends support to low status groups (Lawson, 2012). However, most middle class literature shows that this group seems to be mostly self-interested (Ellis, 2011; Maavak, 2010). Therefore these context-specific responses of fairness and self-interest for the middle class and motivations for bridging (relationship-building versus entrepreneurial) could be conflictual in this experimental

setting. As the original minimal group study showed, there was a strong tendency toward ingroup bias on one hand but also fairness on the other – the latter of which was seen to moderate the excess of the former (Tajfel et al., 1971). Therefore, perhaps for the middle status group, these competing tendencies may be more apparent compared to the high and low status group. However, this possibility would require future research as it is speculative at this point.

In light of the possibility of a social dilemma between fairness and self-interest, the finding of lower superordinate identification for the middle status group may then also be explained in another way. It may be the case that the middle status group shows the behavioural but not psychological component of solidarity due to lower levels of superordinate identification as a result of engaging in a status management strategy, but it may also be the case that this lack of superordinate identity occurred because both the high and low status group failed to reciprocate the allocations. Therefore superordinate identity may be related to the receiving and not giving of tokens as the low and high status group experienced higher superordinate identity (probably with the middle status group). Once again, this explanation requires further research if we were to accept it. This research did not study psychological experiences of fairness or altruism which would be required in order to bolster this line of argument.

In any case, this research has shown that studying a middle status group is potentially a rich avenue of exploration for social psychological research in order to better understand the behavioural and psychological differences and similarities between the middle status and the high and low status groups. This thesis just brushes the surface of the behaviours of this group and motivations behind these and is necessarily speculative due to the limited research into this group.

Summary of the tripolar intergroup setting

Introducing a third group to the experimental setting under different social hierarchies resulted in novel findings. This is valuable as a three-group setting is not often explored in research, and even more so due to the findings concerning middle status group on which currently there is very little research. In particular, I have argued that it is here where the overwhelming trend of ingroup bias (in the form of allocating tokens to one's own group) begins to break down; but possibly not for altruistic reasons. A social dilemma for the middle status group may exist where on one hand there may be a motivation for fairness and on the other hand, self-interest resulting in a strategic play which serves to maintain the status quo or even to improve the middle status group's social position. However, these ideas are post hoc speculations and require further research.

This research also supported some previous findings in the literature regarding the high and low status group. For example, the high status group was shown to have a greater sense of legitimacy and ingroup identification than the low and middle status group while the low status group (due to boundary impermeability) showed increasing ingroup bias (not dissimilar to the high status group) but lower ingroup identification (possibly because the intergroup setting was not seen as particularly illegitimate). These findings related to the high and low status group were apparent even when a third group was added to the two-group paradigm and interaction over time was

allowed to occur. Therefore, not only do these findings for the high and low status group provide support for the existing literature, they also somewhat extend the literature.

In the following section I will discuss how interaction was an important phenomenon in the development of social norms in the current study. Revisiting the social norm theory of social behaviours (for example, ingroup bias) – although rejected by Tajfel in favour of social identity theory (as discussed in the Chapter 2) – was possible through including interaction in the minimal group paradigm. Finally, findings related to the unexpected finding of a disjuncture between the psychological experience of alliance and reality will be explored before the concluding remarks will be made, along with the limitations of this research and recommendations for future research.

The role of interaction in the evolution of social behaviour

By extending traditional social psychological experimental conditions – and the minimal group studies in particular – to include interaction, as well as by allowing participants creative agency; this research acknowledged the crucial role of social context and two-way interaction between social actors that reconstructs their environment. While it is true that people are shaped by the social environment and the norms of that environment, people also have the ability to shape this environment and these norms. In other words, people have agency and are not passive, conforming 'puppets' (Reicher & Haslam, 2013). A social psychological feedback loop exists where social agents and the social environment (and related norms) have influence on one another in a cyclical manner. This has not been made all that explicit in most experimental research to date. By including interaction and focusing in on its role in intergroup relations, some important effects were found regarding the development of social behaviour, as well as the social psychological experience of this interaction.

Norms for ingroup and outgroup treatment change over time

Firstly, with regards to the behavioural patterns explored earlier in this chapter, we were able to see how these develop and change over time. This was especially apparent for the middle status group where ingroup bias slowed down over time while outgroup giving to the high status group sped up. These accelerations and decelerations in the allocation of tokens highlight how behavioural trends are picked up, or dropped, as a function of seeing, and responding to what other social actors do in the social environment. These findings highlight how people are actively making meaning of their environment by picking up on social cues, in terms of what norms are appropriate, and following these norms which further increases or decreases their strength.

Social norms are unique to a particular social context

In addition to the overall changing rates of behaviour, this research also explored how the uniqueness of each social context captured in these experiments, was implicated in the patterns of interactions. This was only possible through the use of social network analysis which takes into consideration the unique patterns of interpersonal and intergroup behaviour which occur in a localized social environment representing a microcosm of society. Social network analysis highlighted how social behaviours may develop differently depending on the context of a particular game while the generalized linear mixed models could only show more general trends

of behaviour for groups under different conditions. Different trends of interacting developed depending on each of the nine unique contexts; no one game exactly mirrored any other. For example, ingroup bias was stronger or weaker for a particular group depending on the actual game rather than the condition. The same was true with the development of unidirectional and bidirectional alliances and competitions.

The fact that the norms developing in each game were powerful enough to be significant within a game suggests that these dominant patterns of giving were unlikely to become dominant by chance, but rather that participants may engage in "trend following" behaviour particular to a social environment which then builds up over the course of the game gaining momentum with time and through interaction.

The role of interaction in the development of interpersonal norms

Furthermore, the possible trend-following behaviour in the intergroup context was also apparent in the interpersonal behaviour between individual participants. For example, in the ranked inequality conditions, players showed a tendency to favour the rich in the game while in the other two conditions (equality and flat inequality) the opposite approach – fairness – was taken. In the latter conditions participants tended to avoid giving to other players who already had a high token balance. This finding suggests that although social structure has a role in the types of norms that are established, these are only established over time which highlights the importance of interaction in the social context.

Including interpersonal (in addition to intergroup) interaction also showed that social memory is apparent in these settings due to the fact that ties between players persisted over the course of the game (in other words, players tended to maintain particular relationships over the course of the game), even though allocations were separated by a few rounds. In addition, this social memory was seen to operate in the few games where reciprocation occurred after a few rounds. The fact that in particular games the rate of these interpersonal behaviours increased shows how they gain momentum over time and are sedimented through interaction. These aspects of social life would not be open to study under conditions where interaction is not possible.

Psychological experiences change over time through interaction

In addition to behavioural trend-following; the effect of time and interaction also possibly has implications for the development of the psychological experience of the social setting. It appears that the social structure alone may not differentially affect levels of ingroup identification, superordinate identity, or legitimacy as these were similar for all groups at the beginning of the game but not by the end. For example, the high status group had the same levels of ingroup identification and legitimacy as the middle and low status groups at the beginning of the game but by the end, their reported levels on these two constructs increased comparatively. In addition, while superordinate identity was similar for groups in the beginning, by the end the middle status group experienced lower superordinate identity. This suggests that groups (regardless of relative status) experience these three psychological aspects in a very similar manner if interaction is not allowed and the psychological experience cannot develop over time.

Therefore psychological experiences are not deterministic products of the social structure but, emerge through the active process of meaning making on the part of the social actors through interaction in that social structure. The present research strongly supports the notion that human beings are not passive recipients to the 'overwhelming influence' of the social environment. Rather we take an active role in creating and making meaning of the social context and furthermore, these meanings changes over time – as they changed from the beginning to the end of the experiments.

Re-introducing the importance of social norms to social identity theory

Tajfel and colleagues (Tajfel, 1970; Tajfel et al., 1971) began the minimal group studies having in mind the impact of social norms on intergroup behaviour. By stripping away the social environment to create 'minimal groups', they hypothesized that participants would draw on social norms to influence their behaviour. The belief was that a social norm of ingroup bias existed. Tajfel later rejected this theory in favour of the social identity perspective (Tajfel & Turner, 1979). We can see from the present experiments that social norms could possibly have been disregarded too soon as behaviour in this experimental setting gained or lost momentum suggesting that it was neither a static norm nor simply an innate need for self-esteem building. Therefore by excluding interaction in the original studies (and conceiving of norms as one-way influencers) the role of social norms – and the way that norms emerge from interaction – was possibly underexplored. Perhaps then the social identity perspective may benefit from also considering the role of norm development on intergroup behaviour as well as how the social psychological experiences of the intergroup setting possibly develop as a result of these norms or vice versa.

Psychological experience versus the reality of intergroup alliance and cooperation

An unexpected component of these results was the apparent disjuncture between the psychological experience of the social hierarchy and the reality of what occurred over the course of the experiments. This has implications for the possible role of psychological perception (versus actual social reality) on intergroup behaviour; and how the former may reflect, or indeed fail to reflect, the latter.

Regarding the perception of intergroup alliance, there are three striking examples of how perception differed from reality. Firstly, there was a strong perception of non-alliance (or competition) between the two equally low status groups (in the flat inequality condition) that was not reflected behaviourally through token allocations. Second, there was a strong perception of an alliance between the high and low status group (in the ranked inequality condition) even though the *exact opposite* was true. Finally, when there was a middle status group, there was also a strong sense of full intergroup cooperation despite the low and high status group engaging in high ingroup bias and intergroup competition between them. Each of these instances, and the potential impact on the social environment, will be explored in greater detail below.

Perceived intergroup competition between low status groups

First, although there was a perceived non-alliance or competition between groups of equally low status (in the flat inequality condition), there was no lesser chance of this alliance forming than any other. One might expect that two groups of equally low status would be more highly motivated to form an alliance as this would improve their chances of bettering their low status position in respect to the high status group – a goal for all disadvantaged groups (Simon & Klandermans, 2001). This strong sense of perceived intergroup competition may be related to the fact that there was a strong perceived alliance between the high and one low status group instead (even though the two low status groups are undifferentiated by initial token balances). The latter perception is not reflected behaviourally either. It would seem that overall; people perhaps thought that the high status group would favour only one of the low status groups, who would in turn pander to them at the expense of the other low status group. This may result in a perceived intergroup competition between the two groups of low status.

This is in some ways quite concerning as it suggests that even if this competition is not happening in reality, the perception of it could further reduce the possibilities for intergroup alliances and solidarities between low status groups against a high status group. This could result in a cyclical pattern of perception and behaviour which prevents the formation of solidarity to challenge the status quo. In fact, in this social hierarchy, there were also overall lower levels of superordinate identification for all groups, suggesting the least possibility for intergroup alliances and solidarity compared to the other social hierarchies. This is because a higher sense of superordinate identification could possibly result in stronger intergroup alliances as identifying with a group may increase the chances of allocating tokens to that group.

Seeing an alliance between the high and low status group where competition exists

The second instance of a divergence between psychological and social reality, which occurred with the introduction of a middle status group, was also related the relationship between the high and low status group. However, this was even more disjointed from reality due to the fact that the *exact opposite* of what was perceived, occurred. In other words, there was actually a significant intergroup competition (in the form of token exchange avoidance) between the high and low status group. Perhaps it is possible that the perception of intergroup alliance and cooperation between a high and low status group serves to maintain the status quo of the social hierarchy. This argument is in light of existing literature regarding the effect of positive intergroup contact on social change (Dixon et al., 2010). We have already seen in Chapter 2 that positive intergroup contact can reduce perceptions of discrimination and increase perceptions of the fairness of high status groups. This leads to lower motivation to change the social setting, especially for low status groups. This occurs despite the continued negative material consequences experienced by the low status group. In fact, the present research may go even further and suggest that even when social actors just have a *perception* of positive intergroup contact, even though this contact may not really exist, the status quo may be supported rather than challenged.

Why perception and reality are completely opposite in this setting may have to do with the role of the middle status group. The middle status group risked ingroup giving with both the high and low status group, possibly in order to maintain or improve their social position – as discussed

earlier. This may have had the unintended consequence of leading to a perception of full three-group cooperation as there was a 'connecting' group (or middle man, so to speak) between the low and high status group. This line of reasoning leads to the third apparent disjuncture between psychological experience and social reality: that is, the perceived full cooperation between a high, middle and low status group.

The bridging role of the middle status group may increase perceptions of a cooperative intergroup setting

No 'full cooperation/alliance' existed between the high, middle and low status group despite this being reported by participants. The high and low status group continued to engage in equally high levels of ingroup bias and engaged in intergroup competition with one another through exclusive token allocations. Therefore, the only apparent explanation for full perceived alliance was the middle status group's role.

We have already explored the possibility that the middle status group engaged in a strategic and risky pattern of giving up their resources in order to try and form reciprocal relationships between the high and low status groups (despite a lack of superordinate identity with these groups). Now, we can perhaps see how this also inadvertently created a false perception of a fair and cooperative social hierarchy in which positive intergroup contact exists among groups. This may have an especially negative consequence for the low status group who may be lulled into a false sense of fairness in the social setting as they view the social hierarchy as cooperative. This sense of cooperation existed even though the high status group was not forming a unidirectional alliance with them.

Furthermore, although they are given an equal number of tokens as the high status group from the middle status group, their relative status remains the same because the high status group's position is maintained. For real social change to occur in the VIAPPL context, the middle status group would need to avoid allocating tokens to the high status group and the high status group would need to avoid ingroup bias. A possible result of perceived positive intergroup contact could be the failure to be motivated to engage in social competition for material social change (Dixon et al., 2010; Saguy & Chernyak-Hai, 2012). However, a caveat to note here would be that the low status group did not reduce their levels of ingroup bias therefore there may be alternative explanations.

In summary, we can perhaps suggest that a divergence in the perception of the social situation and the actual social settings may serve to maintain the status quo and negatively affect whether social change is likely to occur. This has especially harmful consequences for the low status group.

Limitations

Although this study yielded some interesting and novel findings, these should be considered in light of the limitations of the present research.

Firstly, with regards to the VIAPPL method, the interaction allowed in this experimental context was very minimal in nature. Although participants could allocate tokens to any other participant in the social hierarchy over 40 rounds, ultimately these choices were between an ingroup or outgroup member. Therefore one may argue that because of the limited repertoire of social actions afforded, key variables such as competition and ingroup bias were confounded. In a similar way to how critics such as Brewer (1979) and Bornstein et al. (1983) argued that the original matrices from the minimal group studies confounded strategies such as maximum difference in favour of the ingroup and maximum ingroup profit (that is, creating positive distinctiveness or practical ingroup gain), so too does the VIAPPL method. For example, is engaging in ingroup bias due to hostility and a sense of competition felt toward an outgroup or due to practical self-interest for gaining the most tokens possible? This could not be explicitly addressed in the present research. Perhaps addressing this problem would require additional post-experimental questionnaire items to tease apart the varying motivations to distinguish behaviours more clearly. However, although not overcoming all the critiques of the original minimal group studies, including interaction in the VIAPPL environment in this manner did show how social behaviours increase over time, therefore pointing toward the significance of evolution of social norms in intergroup relations.

In light of the finding that each game presented a unique social context in which different behavioural trends developed over time, it may have been worth conducting additional replications of each status condition in order to increase the power of the generalized linear mixed model. This may have enabled one to see whether there were perhaps stronger patterns of behaviour that could attributed to each status condition, especially in light of the fact that there were only 18 participants per game and thus 54 participants per status condition. That is, there may have been a lack of power in which certain particularities of each social hierarchy was lost. For example, including more replications may have illuminated the finding that Group C (the middle status in two out of the three conditions) experienced lower superordinate identity than the other groups. It is possible that adding more power to the analysis may have shown a three way interaction which would have indicated if this was related to one particular status condition over the other two; if not this may suggest some form of onscreen positioning effect not considered in the present analysis.

In addition, from the generalized linear mixed model it is hard to say which behavioural trends were stronger. This is because the models were run separately for each dependent variable (that is, it was not multivariate analysis) and GLMM's do not allow for traditional effect sizes to be calculated, making it difficult to compare the strength of these effects across models. This may be resolved through multivariate analysis (perhaps using R rather than SPSS which does not allow multivariate GLMMs) as well as by using alternative measures to effect sizes (such as pseudo R^2 or Bayesian criterion measures), however this was beyond my abilities at present.

An additional analytic improvement to be made is that the social network analysis package 'relevent' for R used does not presently have the capability to combine the models built and run on each individual network (game) through meta-analysis. Therefore a basic count method was used in this particular research. In addition, there was no way to specify an interaction between the built-in parameters (such as reciprocity and fairness *et cetera*) with group membership. Therefore parameters which were not significant in the present model building process may have become so if these interactions were considered. For example, reciprocity may not have been a strong behavioural trend generally but may have become so if group membership was taken into account (for example, to see whether reciprocity existed with ingroup members but not outgroup members, or vice versa). Therefore improvements could have been made in terms of the data analysis procedure if the required expertise is developed. Having said that, the present analysis was conducted in a careful and systematic manner and it appears reliable in light of the descriptive statistics.

With regards to the psychometric measures, there was room for improvement on this front too, particularly relating to the measures of superordinate identity and perceived alliance. Regarding superordinate identity, the way the questions were phrased could not distinguish between a group's superordinate identity with the two other groups separately (for example, Group A with B *and* Group A with C instead of A with B and C together). Second, with regards to perceived alliance, the measure could have also been extended to ascertain the perception of a one-way pattern of giving between groups in addition to the bidirectional alliances. Therefore, for example, one could have seen if any one group was seen to favour another (even if this group did not reciprocate).

Finally, a feature of the VIAPPL experiments that was beyond the scope of the present study was the potential role of the 'geospatial' positioning of the groups in the virtual arena. It was interesting to note that in the flat inequality condition, one low status group showed lower ingroup identification and that participants were more likely to see an alliance formed between this group and the high status group (although there was no evidence of a greater chance of this occurring than an alliance between the high and other low status group). At this point, there is no theoretical reason for the difference in low status groups other than possibly their position onscreen. Therefore, this may need to be explored, or at least somehow accounted for, in future experiments.

Recommendations for future research

By considering a three-group setting, one of the main strengths of the present research is that it was able to explore the behavioural and psychological components of belonging to a middle status group. Some of the most interesting findings of this study related to the middle status group, especially as there is very little existing research on this group. Therefore one recommendation would be to focus future studies in a 'ranked inequality condition' to more closely explore the middle status group in experimental and embedded social contexts.

Secondly, in understanding social change, it is important to explore under which conditions intergroup alliances and solidarity will emerge to challenge the status quo. As we have seen from the present experiments, no bidirectional intergroup alliances developed, rather ingroup bias remained a strong trend (except for the middle status group, although still no bidirectional alliance was formed with this group). Therefore one avenue for future research could be to explore the ideal conditions under which intergroup alliances will emerge. This could be done by priming perceptions of illegitimacy for example, or by introducing some alliance-initiating event which may then build on itself to create alliances. In this way superordinate identity and perceptions of solidarity may be more closely studied.

The present research showed how interaction and context are crucial for the development of social behaviours and psychological experiences of social settings. I think that this emphasises the recent call by some scholars for social psychology to more explicitly acknowledge and study these effects (see for example Reicher & Haslam, 2013), particularly in the experimental setting. In addition to highlighting the value in developing VIAPPL as an experimental platform, it also suggests the need for all avenues of experimental psychology to focus on interaction over time in order to draw attention to the agency of human beings in the social context. This supports the notion for the need for experimental social psychology to be reinvigorated through new tools which is becoming more possible with the development of new technologies.

A final recommendation relates to the unexpected finding of the incongruence between the psychological perception of the intergroup setting and the social reality of what occurs. This seems to be an interesting and valuable topic for future exploration. It seems to fit in with the recent research on positive intergroup contact which has shown that engaging in positive intergroup behaviour can alter one's perception of the social setting in a way that maintains the status quo (see for example Dixon et al., 2010). The present research may also suggest that even the *perception* of positive intergroup contact, even though this may diverge from reality, may have a similar effect. This seems to be a promising branch for future research.

Conclusions

The aim of this research was to extend social psychological experimental research by 1) adding a third group to the traditional two-group setting to see how this may impact ingroup bias, social identity and the potential for intergroup alliance formation, and 2) to include interaction over time to account for human agency and creativity in the social environment, resisting the conformity bias approach of traditional research. To achieve these aims the minimal group studies were used as a starting point as they were seminal experiments in social psychology and led to the development of social identity theory – a core theory in the field. These experiments were extended through the use of a novel experimental platform – the Virtual Interaction Application (VIAPPL). Due to the fact that this is a novel and developing method which employed the under-researched three-group paradigm, this study may be considered exploratory in nature.

The results showed that, even in a three-group context, ingroup bias was a significant behavioural trend. In all three social hierarchies (equality, flat inequality and ranked inequality), for all but one group, ingroup bias was high. Hartstone and Augostinos (1995) had argued that ingroup bias may decrease in a multigroup setting as there is no stark 'us versus them' dichotomy to fuel intergroup competition. In the present studies, which also included interaction over time, this predicted reduction in ingroup bias was not apparent. In fact, ingroup bias remained so strong that bidirectional (reciprocated) intergroup alliances and solidarity failed to occur. Besides emphasizing the strength of ingroup bias, the lack of bidirectional alliances also shows that the existence of three groups in an unequal social hierarchy is not a sufficient condition for intergroup alliance and solidarity formation but rather some additional features are necessary.

Both high and low status groups showed high ingroup bias. This supports research from the social identity field which argues that while ingroup bias may be low for low status groups under conditions of boundary permeability; when individuals cannot change group membership the low status group will show high ingroup bias to the same extent as high status groups. Including a third group and interaction in the present research has show that the same trends predicted by the literature are supported in this context too.

In addition to the predictions on status and ingroup bias, social identity predictions regarding status and sociostructural variables were also supported. In particular, the high status group showed higher ingroup identification and greater sense of legitimacy than the low status group. Again, the theory and body of work in the social identity field has been supported even with the extensions to the minimal group design – namely adding a third group and allowing interaction among participants. The fact that some well-known theories have been supported using the VIAPPL method both legitimizes the use of this novel experimental method and helps to lend confidence to the results regarding the middle status group.

The addition of the third group enabled interesting findings regarding the middle status group, which is, as of yet, unexplored in the literature. The clearest finding was that ingroup bias decelerated over the course of the game while it increased for the high and low status groups. Furthermore the middle status group allocated tokens to *both* the high and low status group. These clear findings are not explicitly predicted or supported by literature as there is very little

existing research on a middle status group, especially in social psychology. In order to explore these findings theoretically, many speculative and post hoc connections were postulated in the discussion. Although interesting and worthy of exploration, these arguments need further empirical testing before any firm conclusions can be drawn. A potential avenue of exploration could be to directly test the apparent social dilemma for groups who are 'caught in the middle'. Whether the middle status group has a greater tendency toward fairness and justice or whether their behaviour is strategically employed to maintain, or improve, their social position would require additional research.

By studying the effect of interaction on the intergroup setting (unlike the original minimal group studies), reconsidering the role of social norms in the development of intergroup behaviour has also been possible in this research. Most social psychological research has largely ignored the role of context and interaction in the evolution of social behaviour and the psychology tied to this behaviour.

Ingroup bias was found to increase over time for all groups, in all conditions, except for the middle status group. For the middle status group outgroup token allocations to the high status group increased over time, while their ingroup bias slowed down. These two findings alone show how trend-following could be occurring in the VIAPPL environment as participants try to make sense of the social context in which they find themselves and begin to be influenced by, and in turn influence, their groups' behaviour directed toward the ingroup and the outgroups.

Therefore the findings from the present study related to interaction add weight to the argument that 1) there is a reciprocal two-way relationship between people and the social environment such that people are shaped by *and shape* the social context; and 2) social psychological research must be extended to take this into account. Therefore, although Tajfel downplayed the role of social norms in intergroup behaviour as being secondary to the need for self-esteem (Condor, 2003), these results confirm that it may be worth more closely integrating theories related to the development of social norms with the social identity perspective in order to arrive at a more holistic theory of intergroup behaviour.

Finally, along with reaching the explicit aims of the research, unexpected findings emerged which may present an avenue for future research. These findings concerned the divergence between perception and reality of intergroup alliances. It should be noted that because this was never an intended topic of research in this particular study, how this finding may be confidently interpreted is relegated to future empirical research. However, I have suggested that the apparent divergence of the psychological experience of the social setting from social reality, as it relates to intergroup alliances, may serve to maintain the status quo of unequal social hierarchies. The fact that an intergroup alliance between the high and low status group was perceived in the ranked inequality condition, despite the exact opposite occurring, was of particular interest. Furthermore, full cooperation was also perceived in this status structure which may point to the psychological influence that having a bridging group (the middle status group) may have on the perception of the social hierarchy.

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Appendices

Appendix A: Questionnaire

VIAPPL questionnaire: Interaction among three groups

7 point Likert scale:

1	2	3	4	5	6	7
strongly disagree	disagree	somewhat disagree	neither disagree nor agree	somewhat agree	agree	strongly agree

INGROUP IDENTIFICATION

1. I identify with other members of my group (adapted from Postmes, Haslam & Jans, 2013)
2. I have a sense of belonging to my group (Terry, & O'Brien, 2001)
3. I feel strong ties with my group (Doosje, Ellemers, & Spears, 1995).

SUPERORDINATE IDENTIFICATION

4. I identify with one or both of the other groups
5. I have a sense of belonging to one or both of the other groups
6. I feel strong ties with one or both of the other group

LEGITIMACY

7. The difference between my group and the other groups is justified and right (adapted from Weber, Mummendey, &Waldzus, 2002)
8. The difference between my group and the other groups makes sense (adapted from Costarelli, 2007)
9. The difference between my group and the other groups is the way it should be (adapted from Terry, & O'Brien, 2001).

STABILITY:

10. In the next round of the game, how likely are group token differences between groups to change? (adapted from Overbeck et al, 2004)

1	2	3	4	5	6	7
very unlikely	quite unlikely	slightly unlikely	Neither	slightly likely	quite likely	very likely

11. In the next round of the game, I think the relationship between groups will remain stable for the duration of the game (adapted from Mummendey, Kessler & Kink, 1999)

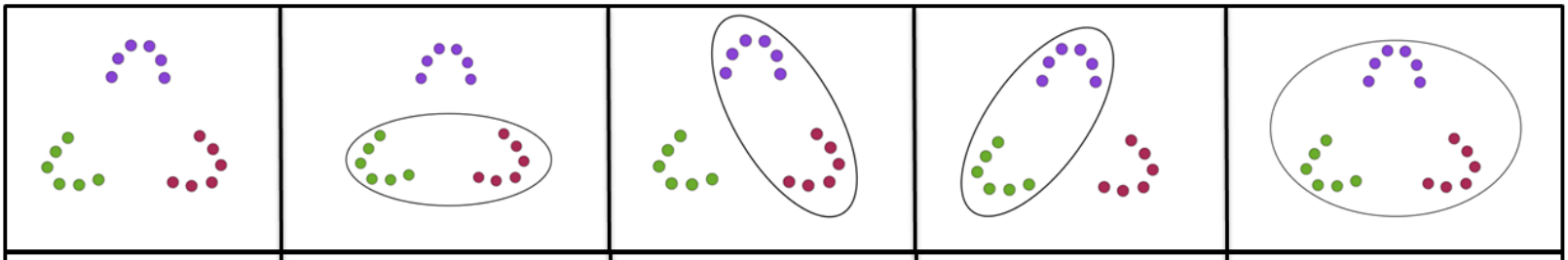
12. The current relationship between groups will not change easily (adapted from Mummendey, Kessler & Kink, 1999)

COMPETITION

13. I felt that my group competed with the other groups.
14. I felt that my group cooperated with the other groups.

PERCEIVED ALLIANCE

15. Chose which picture best represents cooperation between your group and the other groups (code: a, b, c, d, e)



Appendix B: Informed consent

Information Sheet

Dear Participant,

This is a research project on intergroup behaviour.

Brief outline of the study: This research study aims to explore behaviour in a social setting. The study is electronically based game, played by up to 18 players, by giving and receiving of tokens.

What you will be required to do: The study will take place in the Psych Lab. You will be required to play a game and answer a questionnaire. This will take about 20-30 minutes of your time.

Voluntary participation: Your participation is voluntary and you are not being forced to take part in this study. The choice of whether or not to participate is yours alone and there will be no consequences if you choose to not take part. You may withdraw from the research at any time by telling me that you do not want to continue. There will be no penalties for doing so.

Anonymity: Although we will ask you to register as a research participant, your responses will not be linked with your name or any other information by which you can be identified. In other words, you will remain entirely anonymous and your participation will remain confidential. There are no limits to confidentiality.

Research incentive: At the beginning of the experiment you will be divided into a group. After the experiment is complete, you will be given an amount of money as a cash incentive for participation in the study. The amount of money that you receive will depend on **how your group does over the experiment and not on individual performance**. Therefore, if your group finishes the game with the highest number of tokens you will receive a higher cash incentive than if your group ends the game with the least number of tokens. All members of the same group will receive the same cash incentive. The amount of money allocated is predetermined and is not reflected in your group token balance. There will be **an average incentive of R20** per player but please note that **you may finish the experiment with less than this amount** or more depending on your group performance.

I understand/do not understand that I may leave the study with a cash incentive of less than R20.

Furthermore, some groups will start with more tokens than other groups. This will influence your tokens at the end of the game and thus your incentive money. Whether your group has more or less tokens at the beginning of the study is not personal and should not be taken as such.

I understand/do not understand that I may be placed in a group with fewer tokens in the beginning of the game and that this could reduce my final possible cash incentive.

If you participate in this experiment you are accepting that you agree with these conditions. If you do not agree with these conditions then please do not participate in the experiment.

Who to contact if you have been harmed or have any concerns: Although this research involves very little risk, if you have any questions or complaints about aspects of the research or feel that you have been harmed in any way by participating in this study, please contact:

- Project Leaders: School of Applied Human Sciences, University of KwaZulu-Natal: Professor Kevin Durrheim (Durrheim@ukzn.ac.za) and Dr. Mike Quayle (QuayleM@ukzn.ac.za)
- Human Social Science Research Ethics Committee: Ms. Phume Ximba (ximbap@ukzn.ac.za/ 031 260 3587)

Consent form

I hereby agree to participate in research on social interaction. I am aware of what is required of me, and I understand that:

- I am participating freely and without coercion.
- This is a research project whose purpose is not necessarily to benefit me personally.
- I will remain anonymous and my participation in the study will remain confidential.
- I have a right to withdraw from the study at any time, without penalty.
- I agree to the results of my participation being used for research and teaching purposes and for presentation in reports and at conferences. My name will not appear in any of these documents.
- I agree/disagree to the discussion at the end of the game being recorded for research purposes.

Signature of participant:_____ Date:_____

Appendix C: Receipt of incentive

Confirmation of receipt of incentive

Researcher:	
Experiment code:	
Date:	
Time:	
Number of participants:	

I hereby confirm that I received a cash incentive, based on the outcome of the game, for my participation in the VIAPPL study.

	Name	Student number	Amount	Signature
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				

Appendix D: Ethical Approval

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

28 November 2014

Ms Kim Titlestad (209520843)
School of Applied Human Sciences – Psychology
Pietermaritzburg Campus

Dear Ms Titlestad,

Protocol reference number: HSS/0367/014M (Linked to HSS/0021/014)
Project title: Re-imagining possibilities for minimal groups: Adding a third group to the traditional two-group minimal group paradigm to test for patterns of solidarity in conditions of inequality

Retrospective – Expedited Approval

With regards to your application for ethical clearance received on 06 May 2014. The documents submitted have been accepted by the Humanities & Social Sciences Research Ethics Committee and **FULL APPROVAL** for the protocol has been granted.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

Please note: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....
Dr Shenuka Singh (Chair)

/ms

CC Supervisor: Dr Michael Quayle
Cc Academic Leader Research: Professor D McCracken
Cc School Administrator: Mr Sbonelo Duma

Humanities & Social Sciences Research Ethics Committee
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Website: www.ukzn.ac.za

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