Studying the effects of status in an interactive minimal group environment

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Abstract

Background: The Minimal Group paradigm proposed that social categorisation alone was necessary to produce group behaviour. Moreover, through Social Identity Theory the studies claimed that once people are categorised into groups they automatically take on group personas that cause them to favour their ingroups and discriminate against the outgroup. Other scholars contend that groups are not as simple as sharing a social category. They are instead more complex social systems of interacting individuals which consist of dynamics and networks as people engage in social activity and make meaning of their behaviours. Moreover, groups are typically defined by patterns and norms which emerge through interaction and evolve over time. Thus, by having removed interaction from their methodology, scholars believe that the minimal group studies became too minimal that they omitted an essential component involved in groups. There is a need therefore to re-visit these studies in an environment that captures the interactive nature of groups and illuminates the diachronic processes involved in group formation and behaviour.

Aim and Rationale: This research replicated the MG studies in an interactive setting to study the influence of status on the token giving behaviours of minimal groups.

Methodology: The research adopted a quantitative descriptive method. A convenience sampling strategy was used to select participants from the University of KwaZulu-Natal, Pietermaritzburg Campus. An experiment in the format of a computer game was conducted where participants after being categorised into one of two groups, were tasked with allocating tokens to other members of groups over a 40 game round period. The Virtual Interaction APPLication software provided a platform for studying how groups take shape as they interact, receive feedback, and make meaning of their behaviours over time. To measure ingroup favouritism the study measured instances of outgroup giving among the players. Outgroup giving mirrored ingroup giving without self-giving and was therefore deemed as a more reliable measure of ingroup favouritism. All data from the games was saved onto the programme and analysed using the Generalised Linear Mixed Model method.

Results: Findings displayed that players in the group condition were less likely than those in the individual condition to engage in outgroup giving. This meant group categorisation produced group orientated behaviours among participants. Outgroup giving was found to be numerically higher among groups in the social equality condition than those in the social inequality condition, and increased over the rounds. An interaction between status and social equality determined that the difference in outgroup giving between low and high status

groups conditions was highest in the social inequality condition. High status groups displayed significantly higher levels of outgroup giving than low status groups, with this norm increasing over the game rounds. Low status groups displayed the lowest levels of outgroup giving overall.

Conclusion: This study investigated the effects of status on the token giving patterns of minimal groups in an interactive environment. The study determined that ingroup favouritism and outgroup antagonism was highest in conditions of social inequality. Unequal status groups were more likely to favour their own groups in their token allocations than equal status groups. Low status groups were least likely overall to share their tokens with the outgroup and as a result were more discriminatory than high status groups. The study also introduced a new framework for studying groups rather as dynamic and interacting phenomena as opposed to mere social categories. Using this approach, the study demonstrated that group behaviours are indeed marked by sequential patterns of interaction and change processes that increase and gain momentum over time and give rise to normative behaviours. Thus, interaction serves as the primary conduit of social influence between groups as individuals actively relate to one another and make meaning of their behaviours.

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Chapter One: Introduction

The Minimal Group studies became the first model to lay the foundation for the categorisation analysis of intergroup relations (Hewstone, Rubin & Willis, 2002). The studies were concerned with the minimal conditions required to generate group behaviour. To explore this experimental conditions representing ingroup-outgroup relations were set up and participants were led to believe that they had been categorised into one of two groups based on their preference for one of two provided paintings (Tajfel, Billing, Bundy & Flament, 1971). Group categorisation had in fact been random. Participants took part in a resource allocation task where they were to distribute resources between other participants (Tajfel, *et al.,* 1971). Participants however were only identified by their group membership.

Findings of the study established that participants allocated more resources to members of their own groups (Tajfel & Turner, 1979; McGarty, 1999; Tajfel, *et al.,* 1971;; Wilder, 1986). This strategy was coined *ingroup favouritism*; the act of favouring members of one's own group over members of the outgroup. The study as a result concluded that a group, "in its purest form is nothing more than an arbitrary label" (Goette, Huffman, & Meier, 2011, p.2) and that the simple act of categorising people is sufficient enough to give rise to a group. This triggers competitive and discriminatory responses among members of groups to the extent that members favour their ingroups even at the expense of the outgroup (Brown & Gaertner, 2001).

The Social Identity Theory (SIT) was then developed by the researchers to expand upon and account for the psychological effects of social categorisation on groups (Condor, 1990; Hornsey 2008). A *social identity* was defined as an individual's self-concept of who they are based on group membership (Tajfel & Turner, 1979). According to the theory, once people are categorised into groups they immediately take on group personas and because positive social identities contribute to intrinsic feelings of self-worth, people are more likely to favour their own groups than the outgroup as they seek to establish a positive shared identity (Tajfel & Turner, 1979; Hornsey, 2008;).

Research has investigated the effects of status on groups and has found its ability to moderate social identity (Commins & Lockwood, 1979; Ellemers, Wilke & van Knippenberg, 1993; Fedrico & Levin, 2004). Status refers to the "relative position on some evaluative dimension

of comparison" (Tajfel & Turner, 1979, p.43). In these studies status often determined whether members would favour their ingroups or the outgroup. For these reasons some scholars agree that groups in the MG studies particularly favoured their ingroups not due to the categorisation effect, but because they wanted to boost the status of their groups (Hertel & Kerr, 2001).

In further demonstrating the role of status on groups, many studies have explored and compared the behaviours of groups in environments of social equality and inequality (Fedrico & Levin, 2004; Mullen, Brown & Smith, 1992; Rabinowitz, 1999). Findings of the studies have revealed that in environments of social equality, ingroup favouritism is reduced and groups tend to share their resources with one another and pursue fairness and co-operation (Allport, 1954; Branthwaite, Doyle & Lightbown, 1979; Gaertner, Dovido, Anastasio, Backman & Rust, 1993; Harding & Hogrete, 1952;; Hertel & Kerr, 2001). Groups that are unequal in status however are more typically marked by ingroup favouritism and outgroup antagonism, as these environments prompt social competition between groups (Rapoport; 1988; Smith, Jackson & Sparks, 2003; Spears, Jetten & Doosje, 2001).

Additional research has specifically explored the behaviours of socially unequal groups (Bettencourt, Dorr, Charlton & Hume, 2001; Commins and Lockwood, 1979; Ellemers, 1993; Sachdev & Bourhis, 1985, 1987, 1991). Some studies have suggested that because 'high status' is often associated with power and superiority, members of high status groups are motivated to protect their status and thus display high levels of ingroup favouritism (Ellemers, Wilke & van Knippenberg, 1993; Scheepers & Ellemers, 2005). On the other hand, other research has suggested that because low status often affects one's self concept negatively, members of low status groups will strongly favour their ingroups in an attempt to elevate their status (Brown, 1995; Commins,& Lockwood,1979; Rubin, Badea, & Jetten, 2014). This strategy by low status groups is said to represent a broader strategy of social competition, as low status groups enter into 'battle' with high status groups to challenge the status quo (Taubervan & Leeuwen, 2012; Wright, Taylor & Moghaddam, 1990).

While it is undeniable that the MG studies were a pioneer in group research, they have however received criticism (Aschenbrenner & Schaefer, 1980, Bornstein, Crum, Wittenbraker, Harring, Insko & Thibaut, 1983a; Durrheim, Quayle, Tredoux, Titlestad & Tooke, 2016; Rabbie, Schot & Visser, 1989, Rubin & Hewstone, 1998;). A primary concern is the study's conceptualisation of a 'group' (Karp, Jin. Yamagishi & Shinotsuka, 1993;

Bordia, DiFonzo & Chang, 1999). The studies concluded that a group is merely a label, and that it is formed once people are assigned to those labels. Other scholars however contend that groups are more complex. These scholars suggest that a group is rather a social system of interacting individuals who take on the role of social actors as they interact and make meaning of their behaviours (Bordia et al., 1999; Goffman, 1959, 1963). Groups are typically marked by dynamics and feedback processes which yield patterns, networks, roles and even status (Veenstra & Steglich, 2011). These social processes carry meaningful information about the social action of groups, which then evolves and takes shape over time and in turn affects the group and its members (Goffman, 1959; 1963). Therefore, it has been argued that in omitting social interaction from its design, the MG studies became too minimal and lost the essence of a group and the complexities behind its formation and continuation (Durrheim *et al.,* 2016).

The present research as a result aimed to replicate the MG studies in an interactive setting using a lab-based experimental software named VIAPPL.. . Moreover, since groups in the MG studies were implicitly of equal status and yielded no information regarding the influence of status on the behaviours of the groups, the study sought to incorporate this aspect to its design.

Chapter Two: Literature Review

The striving of human beings for status has been explored in various fields of study with extensive theoretical arguments and evidence suggesting that individuals perceive status as a sign of competence and pursue it as a means to achieve power and resources (Huberman, Loch, & Onculer, 2004). The influence of status extends to groups. Groups are a medium of social life and indeed one of the most profound means of interaction between human beings. Research exploring the influence of status on real life groups suggests that groups higher in the social order tend to have more access to scarce resources, receive better social support, enjoy better physical health and have a longer life span (Anderson & Kilduff, 2009). As a result, all kinds of groups in society are typically motivated to work towards increasing the status of their groups because the implications of achieving high status for one's group are so profound (Hogan, 1983).

Whilst there is a variety of research on the influence of status on broader and real life groups, there is much about its influence particularly on minimal groups that has not been investigated. Whether status still plays such a substantial role even within minimal group environments is an area that requires further investigation.

1. The Minimal Group studies

The earliest form of research on social groups, and the first to lay the foundation for the study for intergroup relations were the Minimal Group (MG) studies. The studies conducted by Tajfel, Billig, Bundy & Flament (1971) introduced the methods now known as the Minimal Group Paradigm' (MGP). Previous research on groups claimed that a group is typically formed when people are attracted to one another because they have shared goals and common identities (Sherif, 1936). The MG studies however proposed otherwise, attributing group formation to even more basic processes. To prove this claim, the scholars created studies to test the most minimal conditions required for the development of group behavior.

The studies were experiments that involved school boys participating in what they thought was a study of decision making (Hogg & Vaughn, 2005). They were assigned to one of two groups on a completely random basis but believed that they had been assigned to a group based on expressed preference for paintings by either Kandinsky or Klee (Hogg & Vaughn, 2005). The participants only knew which group they had been assigned to (Kandinsky group

or Klee group), with the identity of their fellow ingroup and outgroup members hidden by the use of code numbers (Tajfel *et al.,* 1971). After proceeding to an isolated cubicle, the participants were handed an allocation booklet and asked to allocate rewards between pairs of recipients identified solely by code number and group membership (Hogg & Vaughn, 2005). "This paper-and-pencil task was repeated for a number of different pairs of in-group and out-group members, excluding self, on a series of distribution matrices carefully designed to tease out the sorts of strategies that were being used" (Hogg & Vaughan, 2005, p.376).

1.1. The Tajfel Matrices

The MG study matrices were the dependent instruments of the MGP intended to measure how groups allocate resources to one another. The matrices would assess the relative strength of the participant allocation strategies during the games (Bourhis, Sachdev, Gagnon, 1994). Each matrix entailed two rows of thirteen numberseach representing a value. The values on the top or bottom row were to be allocated to the ingroup or outgroup depending on the participant's choice of allocation. This allocation choice could either be between an ingroup or outgroup member, two ingroup members, or two outgroup members. The matrices were designed in such a way that six basic reward-allocation strategies could be distinguished. These strategies were highlighted by Bourhis *et al.* (1994) as follows;

1.   **Fairness** also known as parity (P), referred to the numerically equal allocation of rewards to both ingroup and outgroup members.

2.   **Maximum joint profit** (MJP) concerned an allocation strategy that sought to maximize the total joint number of rewards to both the ingroup and outgroup.

3.   **Maximum ingroup profit** (MIP) involved allocating the greatest rewards to the ingroup members.

4.   **Maximum differentiation** (MD) was a discriminatory strategy which sought to maximize the difference of reward allocations between the ingroup and outgroup at the expense of the outgroup, even if the ingroup received less than the possible maximum as a result.

5.   **Ingroup favouritism** (FAV) referred to an allocation strategy which favoured the ingroup and was achieved through the combination of both the MIP and MD strategies.

6.   **Outgroup favouritism** (OF) referred to the favouring of the outgroup by allocating greater rewards to its members.

Ultimately, three matrices were designed as instruments and used to measure the following allocation strategies (Bourhis *et al*, 1994);

1. *Matrix Type A* provided a comparison of **ingroup favouristism** (FAV= MIP+ MD) to **maximum joint profit** (MJP)
2. *Matrix Type B* provided a comparison of **maximum difference in favour of the ingroup** (MD) to the **combination of maximum ingroup profit** (MIP) and **maximum joint profit** (MJP)
3. *Matrix Type C* provided a comparison between **fairness** (P) to **ingroup favouritism** (FAV).

Figure 1: Tajfel *et al.* (1971) matrices demonstrating allocation strategies to ingroup and outgroup

These instruments essentially provided the allocation options of fairness, ingroup favouritism and outgroup discrimination. On the matrices as illustrated in *Figure 1* (adapted from Table 6 in Experiment 2), in Type A matrix for example, when a participant allocated rewards to a member of their ingroup the allocation strategies of maximum joint profit, maximum ingroup profit and maximum difference in favour of the ingroup were positioned on the extreme left of the matrix (Tajfel*, et al.,* 1971). Contrarily in the Type B matrix, when the participant allocated rewards to a member of their outgroup these were positioned on the extreme right (Tajfel *et al.,* 1971).

1.2. Ingroup favouritism

The results of the experiments determined that participants tended to significantly allocate more rewards to members of their own groups. That is, groups were more likely to favour members belonging to their own groups (FAV) in their allocations than those of the outgroup (Tajfel *et al*., 1971). The studies consequently coined this phenomenon "ingroup favouritism", which referred to the preference and affinity for members of one's group over those of the outgroup (Turner, 1987).

From these findings the MG studies concluded that whilst categorisation generally serves as a structure for individual understanding of the social environment, it also draws the line between "us and them", producing an orientation for self-reference where individuals begin to define themselves and their positions according to the groups they have been assigned to (Brown & Gaertner, 2001; Brown, Tajfel & Turner, 1980;). Subsequently, the studies concluded that the simple act of categorisation alone was necessary to produce a group. Furthermore, the studies highlighted that categorisation "propels the individual down the road to bias" (Wilder, 1986 in Brown & Gaertner, 2001, p.13), meaning that assignment to groups automatically triggers discrimination in favour of the ingroup, even at the expense of the outgroup (Allen & Wilder, 1975).

2. Social Identity Theory: why do members favour the ingroup?

Researchers of the MG studies later developed the Social Identity Theory (SIT) to expand upon and offer psychological explanations of the MG findings. According to SIT, once having been categorised into groups people immediately begin define themselves in terms of their group membership (Condor 1990, Hornsey, 2008; Turner, 1975; Tajfel & Turner, 1979). This group persona was referred to as *social identity*. This was an individual's knowledge of their belonging to a social group as well as their self-concept of who they are based on group membership (Tajfel & Turner, 1979; Turner, 1975;). In addition, social identities were described as relational and comparative, often "defining the individual as similar or different from, as better as or worse than, members of other groups" (Tajfel & Turner, 1979, p.40).

SIT proposed that people are generally motivated to attain positive social identities as these increase sense of self-worth (Tajfel & Turner, 1979). As a result, people are more likely to favour their own groups because they seek to establish positive social identities. When a group compares favourably to relevant others members of those groups also begin to view

themselves more positively (Rubin & Hewstone, 1998). Additionally, groups are also capable of preserving positive social identities by ensuring that the group continues to compare distinctively and favourably from other groups (Scheepers & Ellemers, 2005). Since a positive evaluation is preserved when ingroup-outgroup comparisons favour the ingroup, members of groups will be more inclined to strongly favour their ingroups whilst viewing the outgroup negatively (Harvey & Bourhis, 2013).

3. The influence of status on groups

Research investigating the influence of status on groups has found that it tends to act as a moderator of social identity. Status is an indicator of a group's "relative position on some evaluative dimension of comparison" (Tajfel & Turner, 1979, p.43) and consequently people will generally aspire to belong to groups that are of a higher status as this enhances social identity (Tajfel & Turner, 1979). Hertel and Kerr (2001) contend that status serves as a vital incentive and motivating force of social behavior between groups and consequently suggested that groups in the MG favoured their own groups not only due to the categorisation effect, but because they sought to boost the status of their groups. Similarly, Rabbie, Schot and Visser (1989) argue that ingroup favouritism in the MG studies reflected participants' desires to acquire as many rewards as opposed to trying to enhance self-esteem.

3.1. Groups in contexts of social equality and inequality

Group status is characteristically determined by the presiding social organisation in which groups are present. This is referred to as the *social structure*. The social structure serves as a guide for behaviour in that it constructs the context in which groups interact (Ellemers, 1993; Scheepers, Spears, Doosje & Manstead, 2006). The relationship between the social structure and status of groups has been investigated in numerous studies. The studies have determined that groups often demonstrate different behaviours in environments of social equality and inequality. (Bettencourt, Dorr, Charlton & Hume, 2001; Ellemers, 1993; Ellemers, Wilke & van Knippenberg, 1993;).

An equal status environment is one where groups compare the same in terms of relative status (Commins & Lockwood, 1979). This environment is devoid of status differences between groups and groups are generally able to obtain the status positions that they deserve without being restricted by their socio-economic background (Sachdev & Bourhis, 1991).

Studies have found that in contexts of equal resources between groups, social discrepancies between groups are less likely to arise (Allport, 1954; Branthwaite, Doyle & Lightbrown, 1979; Gaertner, Dovido, Anastasio, Bachman & Rust, 1993; Harding & Hogrete, 1952;). Adopting Hewstone & Brown's (1986) Mutual Intergroup Differentiation Model, Gaetner *et al.,* (1993) tested whether interaction between equal status groups would be effective in reducing intergroup bias and whether attitudes towards the outgroup would be more favourable. The study's findings did in fact determine that when groups were of equal status, discrimination against the outgroup was reduced (Gaetner *et al.,* 1993). Another study by Eek, Biel & Garling (2001) tested the effects of equality on the cooperative responses of groups in contexts of social dilemma. The study found that when groups were of equal status both groups tended to pursue fairness and cooperation. Additionally, in these contexts social cohesion between the groups has been found to be strengthened. Studies investigating inter-ethnic relations in such environments have consistently demonstrated that equality between groups reduces prejudice (Pettigrew, 1998).

Unequal status environments on the other hand are marked by social hierarchies and status differentials between groups (Ellemers, 1993). Research has shown that unequal contexts typically cultivate opposing motives between groups (Smith, Jackson, Sparks, 2003; Rapoport, 1988). Hewstone and Brown's (1978) study demonstrated that when a group perceives itself as higher in status compared to other groups, its members are more likely to display behaviours that favour the ingroup (Eek, Biel and Garling, 2001). Other research holds that when society is stratified and when status imbalances between groups are salient, relations between the groups will be characterised by high levels of ingroup favouritism and outgroup antagonism (Smith, Jackson & Sparks, 2003). Furthermore, studies conducted on ethnic and religious groups have consistently revealed that when there are clear status differences between such groups, intergroup discrimination is accentuated and often produces large-scale violent conflicts (Smith, Jackson, Sparks & 2003; Spears, Jetten & Doosje, 2001).

3.1.1. Low and High status groups: who discriminates more?

Various studies has further investigated the effects of status asymmetries in low and high groups (Commins & Lockwood, 1979; Bettencourt et al., 2001; Ellemers, et al., 1993; Mullen, Brown & Smith., 1992; Fedrico & Levin, 2004; Sachdev & Bourhis, 1985, 1987, 1991;,;). High status is typically associated with prestige and power (Taubervan & van Leewen, 2012). Moreover, in society members of high status groups are often respected, or

held in higher regards (Barkow, 1975; Ellemers, *et al.,* 1993). Consequently, membership in a high status group is generally perceived as more attractive than belonging to a group of a lower status. Social Identity Theory claims that membership in a high status group inevitably results in a positive social identity (Hewstone, Rubin & Willis, 2002). According to the theory, due to the positive contribution that high status rewards to one's self concept, members of relatively higher status groups are likely to find it easier to demonstrate bias in favour of their ingroups (Hewstone *et al.,* 2002). Favouring their own groups also represents a strategy by high status members to protect and maintain their status (Ellemers, 1993). Mullen *et al.,* (1992) conducted a series of minimal group experiments that investigated the effect of status on the point allocation strategies of low and high status groups. These studies determined that high status groups were more likely to favour their own groups whereas low status groups often favoured the high status outgroup (Sachdev & Bourhis 1985, 1991). These findings have led some scholars to believe that high status groups are more discriminatory than low status groups (Fedrico & Levin, 2004).

Low status on the other hand is generally deemed as less favourable and membership in a low status group is said to affect one's self-concept negatively (Scheepers & Ellemers, 2005). Some scholars argue that members of low status groups will be less likely to favour their ingroup and would instead display favouritism to the high status outgroup (Ellemers, 1993). Various studies found that members of low status groups did in fact display favouritism towards the high status outgroup (Jost & Hunyady,2002; Jost and Burgress,2000 and Jost, Pelham & Carvallo, 2002). . The studies concluded that this was due to their internalized a sense of inferiority. Other scholars however argue otherwise and suggest that the impact of 'low status' on deprived groups will most likely produce less adequate social identity on its members giving rise to 'threat' on their social identities as they assume subordinate positions (Brown, 1995; Commins & Lockwood, 1978; Rubin, Badea, & Jetten, 2014). Consequently, members of low status groups will be more motivated to attain more positive social identities and as a result will display higher levels of discrimination against the high status outgroup (Ellemers *et al.,* 2003). By strongly favouring their own groups, low status members are able to use this method as an instrumental means of reversing the status quo through elevating their own status (Scheepers & Ellemers, 2005).

4. Ingroup favouritism as social competition

Since groups are generally not fond of occupying the bottom of the social hierarchy and few are unwilling to share the top position, conflicts between low and high status groups may be a challenge to resolve (Maiese, 2004). Scholars suggest that ingroup favouritism by low and high status groups also represents a broader strategy of social competition (Scheepers, Spears, Doosje & Manstead, 2006). Social competition is a form of 'identity conflict' typically comprised of issues around the distribution of resources and battles for status and privilege (Maiese, 2004). As groups generally have an instinct for self-preservation they may be persuaded to fight for a spot in social relations. Thus, when entering into social competition with one another low and high status groups may display explicit expressions of ingroup favouritism (Scheepers, *et al.,* 2006).

Research has confirmed the presence of social competition between low and high status groups in contexts of social inequality. Various studies found evidence for low status groups displaying high levels of ingroup favouritism and confirmed these as serving as both joint action and enhancement strategies to enter into direct competition with high status groups in order to challenge the existing social order (Bettencourt et al., 2001; ; Ellemers & van Knippenberg, 1997; Wright, Taylor & Moghaddam*.,* 1990;). However, other studies also yielded the same behaviours in high status groups (Ellemers, 1992, Mullen *et al.,* 19992). Mullen *et al.*, (1992) particularly determined that in certain contexts, high status groups also significantly favoured their ingroups. These studies interpreted these behaviours as having stemmed from the possibility of the status hierarchy being rearranged, which was said to have placed demands on members of high status groups where the prospect of change posed as a threat to the group's advantaged position and symbolized the risk of losing their status (Scheepers & Ellemers, 2005; Taubervan & Leeuwen, 2012).

It is evident that conditions of social inequality can incite social competition aimed at either the attainment of status by low status groups or maintenance of status by high status groups (Ellemers *et al.*, 1993). These conflicting motives lead groups to want to dominate other groups and compete with them for a higher status position (Maiese, 2004). Consequently,

"both parties [may] feel threatened and sense a need to retaliate in order to defend themselves. As the struggle continues, the conflict tends to escalate, and may even become violent. Unless… [high status groups] are willing to share their top position

with everyone else (thus eliminating many of the benefits of being on the top), the conflict will most likely continue. Moreover, even if… [low status groups] are able to reverse the situation and become the leadership group; a new conflict is likely to arise as… [the high status group now at] the bottom begin[s] their attempt to… climb [back] to the top." (Maiese, 2004, p. 1)

5. Who is deserving of occupying the top?

In many situations "groups believe that they deserve a higher status in virtue of their supposed moral superiority" (Maiese, 2004, pp 1). Those situated in the lower rank of the social hierarchy may believe their social status to be a form of injustice that requires fighting to overcome (Maiese, 2004). Studies have tested the conditions under which groups might socially compete and where status relations can be overturned. Findings have determined that when status relations between low and high status groups are perceived as deserved, low status groups show more favouritism towards the high status outgroups (Sachdev & Bourhis, 1987; Bettencourt *et al.,* 2001). In these contexts groups are often perceived as incomparable, meaning that intergroup discrimination will be reduced (Ellemers, 1993). It is reasoned that when groups believe that status relations are deserved, low status groups will acknowledge their inferiority to high status groups and refrain from group attempts at establishing more positive social identities or claiming superiority (Mullen *et al.,* 1992).

On the other hand when status relations are perceived as undeserved, low status groups seek to improve the status of their groups as a whole (Bettencourt et al., 2001; Ellemers, 1993; Ellemers, et al., 1993; Ellemers & van Knippenberg, 1997; Tajfel & Turner, 1986; Turner & Brown, 1987;). Intergroup comparisons in these conditions generally will arise and serve as basis for frustration among low status groups and a threat for high status groups, and as a result inciting social competition (Ellemers *et al.,* 1993).

6. Methodological critique of the Minimal Group studies

The MG studies (1971) provide a useful and practical framework for studying the behaviours of groups in experimentally controlled conditions. As demonstrated by Mullen *et al.* (1992), they even offer the prospect of studying the influence of status in very basic settings of minimal groups. Whilst the studies have been a forerunner in group research the methodology has not gone without its fair share of criticisms. Over the years arguments have been raised around the methodology employed by the studies. Some of these arguments have highlighted

that the study omitted social interaction as an essential component of group formation.. , In addition the study used an extreme scoring design which is said to have produced demand characteristics and possible errors in the interpretation of findings (Aschenbrenner & Schaefer, 1980, Veenstra & Steglich, 2011).

6.1. Groups are systems of interacting individuals rather than labels

In seeking the most basic conditions for the formation of group behavior the MG studies omitted social interaction from their design. The studies then concluded that social categorisation alone was necessary to produce a group – demonstrated by the significant finding of ingroup favouritism and outgroup discrimination (Aschenbrenner & Schaefer, 1980). Some scholars however argue that groups are far more complex than people simply sharing a label. This line of thought asserts that groups are instead social systems of interacting individuals typically characterised by multiple and dynamic processes which give rise to its existence (Bordia, DiFonzo & Chang, 1999; Hackman, 1990; Karp, Jin. Yamagishi & Shinotsuka, 1993;).

Without interaction individuals in the MG studies were passive beings taking part in an activity (Durrheim, Quayle, Tredoux, Titlestad & Tooke, 2016). In a group however, individuals are rather 'actors' engaging in social activity as they perform with and towards one another and receive responses in return (Goffman (1959) in Abrams & Hogg, 1988). This means that groups take shape through social interactions as individuals seek to make meaning of their behaviours and participate in constructing their own realities (Goffman, 1959; Sutton & Douglas, 1993). This is viewed as a performance which itself is influenced by the context in which the groups exist as well as the members observing the interaction (Goffman, 1959).

6.1.1. The role of interaction on social identity

Social identity is generated collaboratively as groups interact and perform specific tasks (Goffman, 1963). Therefore social interaction in these contexts facilitates social identity as groups act in relation to one another and negotiate their behaviours (Goffman, 1963). The process for establishing social identity "becomes closely allied to the concept of the "persona" [which is described as] that part of the individual's performance which regularly functions in a general and fixed fashion to define the situation for those who [act] and observe the performance" (Goffman, 1959, p. 22).

6.1.2. Group norms

As interactions and social activity take place between members of groups information is exchanged. Often this information contains ideals, traditions and socially accepted conventions (Doyal & Harris, 1986). Jetten, Spears and Manstead (1996) define these as the ideological content of group norms.

Norms have been a key feature in group research over the years. Early studies by Asch (1951) described social norms as 'mutual conformity'; where group members come to be influenced by each other's opinions simply because there is no initial clear standard to begin with. Similarly, Homans (1950 in Thibaut & Kelley, 1959) defined norms as "an idea in the minds of the members of a group… that can be put in the form of a statement specifying what the members or other [people] should do, ought to do, are expected to do, under given circumstances…" [p. 129]. Sherif's (1936) 'autokinetic effect' study revealed that participants' behaviours were strongly influenced and changed by the actions of others.

In order for norms to exert social influence they must however be communicated between people (Rimal & Real, 2005). Social interaction plays a crucial role in facilitating the process of the communication and establishment of norms among groups. These communications are carried through social networks or ties and serve to diffuse information and norms between groups as they negotiate guidelines for group members on how to perform (Arrow, Poole, Henry, Wheelan & Moreland, 2004; Bordia, *et al.,* 1999;). Therefore interaction as a process of group formation forms the very basis of norm adoption which in turn serves as a conduit of influence (Rimal & Real, 2005).

6.1.3. Temporal and evolving nature of group interaction

The MG studies failed to recognise and capture the role of social networks and ties as unit forming processes of groups. Not only was this due to the fact that social interaction was removed from the design, but it was also due to the study observation of group behavior as a once off event rather dynamic and sequential process (Sutton & Douglas, 2013; Durrheim *et al.,* 2016).

It has been suggested that groups evolve and take shape over a series of events and periods (Goffman, 1959; Bordia, DiFornzo, Chang, 1999; Durrheim *et al.,* 2016). This is referred to

as the temporal perspective of groups, which interprets groups as systems in which change transpires over time scales (Arrow *et al.,* 2004). In this approach groups are marked by social ties that "develop over time… together with the individual [and group] characteristics that change over time" (Veenstra & Steglich, 2011, p.598). These "network change[s] constitute a mutually dependent feedback process" (Veenstra & Steglich, 2011, p.502) as information is exchanged during the interactions. Over time patterns of behavior emerge from the interaction which then gain strength over time and give rise to norms which subsequently affect the group and its members (Bordia et al., 1999; Lewin, 1943a).

These interpretations and arguments point to the fact that studying groups without understanding the unit forming processes which give rise to their existence as well as the fact that groups change systematically over time is erroneous (Arrow *et al.,* 2003) As a result the conceptualisation of 'a group' by the MG studies is problematic. Moreover, it can even be argued that in their pursuit for experimental control the studies became too minimal to the extent that they lost the essential features of a group (Durrheim et al., 2016; Sutton & Douglas, 2013;).

6.2.   Errors with the Tajfel Matrices

An abundance of literature has raised concerns around the instruments used in the MG studies (Aschenbrenner & Shaefer, 1980; Condor 1990, Spears *et al.,* 2001, Brewer & Silver, 1978; Hertel & Kerr, 2001, Bornstein, Crum, Wittenbraker, Harring, Insko, Thibaut, 1983a; Gerard & Hoyt, 1994). Critics point out what are believed to be a variety of systematic errors within the design of the instruments and as a result may have affected the interpretability of the study data.

Figure 2: Potential errors of the Tajfel *et al.* (1970) matrices

6.1. Extreme scoring design of the matrices

The MG studies found that participants not only favoured their own groups but that they also selected the option of maximizing the difference in the rewards between the ingroup and outgroup (Tajfel *et al.,* 1971). The studies concluded that categorisation of people into groups is sufficient to give rise to discriminatory responses to the extent that members will often favour their ingroups even at the expense of the outgroup (Brown & Gaertner, 2001).

These significant findings however have been attributed to the extreme arrangement of scores on the matrices. On the left side of the matrix (*see Figure 2*) for example, a member could opt to allocate a relatively large reward (e.g. 25) to another member of the ingroup, but another member of the outgroup would receive a slightly less reward (e.g. 19). The opposite was true on the right side of the matrix where the participant could allocate a very small amount to the ingroup (e.g. 1) while the outgroup would obtain an even larger reward (e.g. 7). In addition, while the matrices included allocation strategies that emphasized 'joint profit', the majority of participants chose point distributions which maximized the difference between group outcomes. For these reasons some scholars argue that the design of the matrices may have substantially shaped participant responses to the point of even setting up the conditions for ingroup favouritism to occur (Bornstein, et al., 1983a ; Hertel & Kerr, 2001,).

6.3.   Demand characteristics and social desirability effects

Other than extreme scoring, researchers claim that the method of using matrices to study group behaviour may have produced demand characteristics and social desirability effects. Gerard and Hoyt (1974 in Blank, 1997, p.39) for example argue that "the presence of the group membership information in the matrices gives a strong clue to a plausible interpretation of an otherwise rather strange task, namely, dividing money between two anonymous people". This suggests that the information present on the matrices prompted participants on how to allocate their rewards – that is, in such a way "make[s] a difference where a difference is provided" (Gerard & Hoyt, 1974 in Blank, 1997, p.39).

Harstone and Augoustinos (1995, p.188-189) further claim that "[t]here may be something particular about the dichotomous categorisation [of the matrices] which elicits ingroup favouritism and outgroup discrimination". A two group context, the scholars argue, makes group differentials more obvious, causing for the situation to be easily interpreted as 'us' and 'them'. To test this theory they replicated the MG studies in both a two group and three

group setting. The studies found that in a three group setting ingroup favouritism was not as distinct (Harstone & Augoustinos, 1995). The absence of significant intergroup discrimination within the three group setting confirmed their claims about the matrices having elicited demand characteristics.

Brewer and Silver (1978) similarly contend that the matrices were structured in such a way that reward allocations to either an ingroup or outgroup member were obligatory. This produced a 'forced choice' structure that automatically superimposed a competitive strategy among participants making the act of favouring one's own group inevitable (Brewer & Silver, 1978). Furthermore, it has been argued that the matrices in their limited reward allocation strategies coerced participants to select a less than ideal preference which was ingroup favouritism, making it possible to assume then that the structure of the matrices may have prohibited the occurrence of alternative forms of group behaviour (Bornstein *et al.,* 1983a).

7. The Virtual Interaction Application Platform

At present there is a need to re-envision the MG studies to address some of its shortcomings. In 2011 Durrheim & Quayle developed a lab-based experimental software named the Virtual Interaction APPLication (VIAPPL) for behavioural research. Having acknowledged "that social identities and norms emerge in interaction, and [recognised] the need for dynamic explanations of the conversations and change of social structures and outcomes" (Durrheim & Quayle, 2012, p. 1), the scholars offered the experimental technology as a solution for conducting such research.

VIAPPL is a platform that allows researchers to replicate the MG studies in an environment that facilitates the exploration and observation of patterns of interaction between individuals and groups. The software presents the MG in a game format capable of running multiple games simultaneously while storing intricate and detailed game information on a database (Durrheim & Quayle, 2012). The game titled "Give and Get" is designed for groups to allocate token rewards to other players which are either members of the ingroup or outgroup over a 40 round period. Players are at liberty to adopt their own strategies as they allocate tokens. Groups are arranged in a virtual arena and represented by circular colour-coded avatars (*See Figure 3*) (e.g. purple vs green group). As groups interact, feedback is provided to the players and displays how groups allocated their tokens after each round (Durrheim & Quayle, 2012). Thus the developing and on-going interactions are visible to all those within the interaction. Furthermore, the point balance is presented after each round. While the games

are currently limited to "transferring 'tokens' from player to player, future implementations will allow additional [interactions] in the future [such as] moving within the game arena, and messaging other players" (Durrheim & Quayle, 2012, p.1).

Figure 3: Virtual arena demonstrating social interaction between groups where social ties are visible
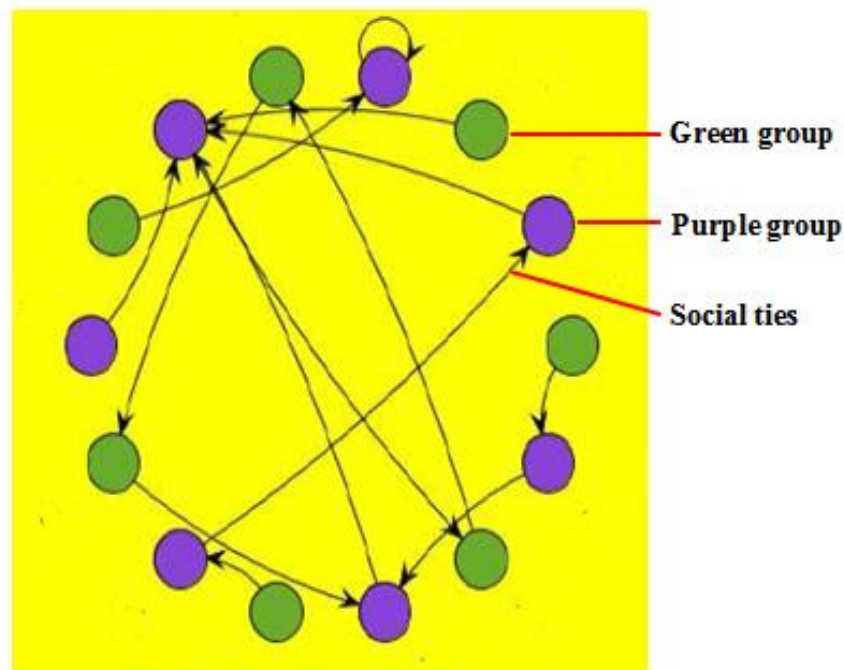
The present research aimed to investigate the interactions of minimal groups in conditions of varying social status in order to study the influence of status on the token allocation patterns of groups. Games were set up in conditions of social equality and inequality and the resultant interactions were compared. This method provides a promising solution for more innovative ways of studying groups in ways that previous research on minimal groups has previously lacked. Unlike the isolated pen and paper task, the experiment transpires over a number of game rounds and therefore retaining the temporal and evolving aspect of group behaviour. The methodological strength of this novel interactive design is that social action is in context, meaning that members of groups have the opportunity of making sense of their responses in relation to others and therefore making the arising social activity meaningful.

Chapter Three: Aim and rationale

Social psychological research has established that people are inclined to develop identities based on group membership when they are categorised into groups. The Tajfel *et al.* (1971) 'Minimal Group' (MG) studies, is one of the most influential experimental studies of intergroup relations. Results of the study found that a large number of participants favoured members of their own groups by significantly rewarding it more resources and this often ensued at the cost of maximising absolute gains to the ingroup over the outgroup (Turner, 1987). This behaviour was termed as "ingroup favouritism"; the tendency to favour one's own group over the outgroup whether in attitudes, behaviour, preference or perception (Brown, Tajfel & Turner, 1980).

These results were further explained by the Social Identity Theory (SIT) which ascribed the strong incidence of ingroup favouritism to psychological reasons of the need for a social identity. A social identity was referred to an individual's knowledge of who they are based on their group membership (Tajfel & Turner, 1979). Research has determined that status as an indicator of a group's relative position on an evaluative dimension however also plays a substantial role in social group behaviour (Hertal & Kerr, 2001; Huberman, Lock & Onculer, 2004; Sachdev & Bourhis, 1987; Rabinowitz, 1999;). Status has been shown to be a moderator of people's social identity often serving as an incentive and motivating factor for groups (Ellemers, 1993; Scheepers & Ellemers, 2005; Ellemers, Wilke & van Knippenberg, 1993,). Additionally, research has highlighted that the status of groups is characteristically defined by the social structure which guides how groups interact within the various contexts (). In environments of social inequality, groups are said to be more likely to display ingroup favouritism and outgroup antagonism, whilst groups in socially equal contexts are more likely to display cooperation, fairness and empathy (Allport, 1954; Brown, 1978; Gaertner, Dovido, Anastasio & Rust, 1993; Smith, Jackson & Sparks; 2003).

While the MG studies were a pioneer for social group research, they have received strong criticism for their methodological design. The first argument suggests that in removing social interaction the studies became too minimal to the extent of omitting a component vital to the understanding of social group formation, processes and continuation (Durrheim, Quayle, Tredoux, Titlestad & Tooke, 2016; Sutton & Douglas, 2013;). Evidence claims that groups take form through processes and interrelations as members of groups interact with one

another and make meaning of their behaviours (Bordia, DiFonzo & Chang, 1999; Durrheim *et al.,* 2016). During this process members of groups not only prescribe to one another the kinds of attitudes, behaviours and norms that are appropriate within those social contexts, but they also collaboratively negotiate their social identities (Goffman, 1959, 1963). The original studies interpreted groups merely as labels and failed to take into account normative social influence in governing and motivating the development of group behaviours (Doyal & Harris, 1986; Rimal & Real, 2005; Thibaut & Kelley, 1959;).

To address these limitations the present research conducted the studies within an experiential interactive computer game environment named 'Give and Get', facilitated by the Virtual Interactive Application (VIAPLL) software programme. The software provided a platform representing an ingroup-outgroup scenario whereby in each game participants allocated to one of two groups could interact virtually with one another during the tasks which involved allocating tokens to other members of a group. The game presented a virtual arena on which the ingroup and outgroup was physically displayed and the actual members of both groups remained anonymous.

During the games social ties representing the token allocations from a group member to another group member were displayed and players insight into the giving strategies adopted by others. In this way social processes between groups could arise both naturally and normatively without predefined boundaries. This also related to the second criticism of the studies regarding the temporal and evolving nature of social group behaviour. Scholars have argued that group processes that are unique to groups are in actual fact a diachronic progression and place in the form of social networks as members of groups interact with one another, where social behaviours normatively emerge over time (Condor, 1990; Veenstra & Steglich, 2011).

The original MG studies studied group behaviour as a once off non-interactive event where participants simply allocated resources between groups on a piece of paper during one experiment (Durrheim *et al.,* 2016). The present study conducted the experiments over a 40 game round period to allow normative behaviours of token giving to develop in an on-going manner over time.

Furthermore, critics have pointed out systematic errors in the Tajfel matrices - the instruments used by the MG studies to measure group behaviour. The matrices were designed

in such a way that it meant that on one end a member could either allocate a relatively large reward to the ingroup while the outgroup would receive a slightly less reward. On the other end of the matrix a member could allocate a very small reward to the ingroup while rewarding the outgroup with a larger reward (Tajfel *et al.,* 1971). This extreme scoring design is believed to have elicited the strong finding of ingroup favouritism where participants almost automatically chose point distributions which maximized the difference between group outcomes (Aschenbrenner & Shaefer, 1980; Bornstein, Crum, Whitaker, Harring, Insko & Thibaut, 1983a;) Other scholars have further linked the matrices to demand characteristics and social desirability effects, suggesting that the matrices in their scoring served as guidelines as to how groups are to respond (Gerard & Hoyt, in Blank 1997; Harstone & Augoustinos, 1995). The present study addressed these concerns by adopting an experiential computer game rather than a matrix design. The games represented ingroup-outgroup relations on a virtual arena and allocation strategies were not imposed. Moreover, groups could only allocate one token reward at a time without maximizing or minimizing group token difference.

Study objectives

The objectives of the research were to:

1. Test the effects of group membership on participants.
2. Test the effects of status on the token giving behaviours of groups
3. To compare token giving behaviours of groups within the socially equal and unequal conditions to determine which would be more likely to display higher levels of ingroup favouritism.
4. To compare and determine which groups between low and high status in conditions of social inequality would be more discriminatory and less likely to give tokens to the outgroup.

Study hypotheses

The study proposed the following general hypotheses for the effects of the experimental manipulations:

H1: Players categorised into groups will display patterns of "groupness" in their interactions.

H2: Groups in the social inequality condition will engage in less outgroup giving than groups in the social equality condition.

H3: Low status groups will be more discriminatory by engaging in less outgroup giving than high status groups.

Chapter Four: Methodology

Research Design

This research adopted a combination of the two most basic experimental designs; the within - subjects design and between - subjects design. The research was conducted through the Virtual Interaction Application (VIAPPL), which was presented to the participants in the 'Give and Get' game format.

Participants were subjected to two treatment conditions; the individual (A) and intergroup (B). In the individual condition participants played the game without group membership. In the group condition participants were randomly assigned to a group and played the game as a group member. In each of the games participants had 40 rounds to allocate tokens resources to another participant, and they were expected to "give" one token per round. This design facilitated the observation of different interaction patterns and behaviours that would arise within the separate conditions.

Table 2: Six group study of intergroup behavior

Individual Condition			Group condition		
Equal	Unequal		Equal	Unequal	
	High status	Low status		High status	Low status

This study was part of a larger study of intergroup behaviour, *Table 2* outlines the between-groups factors within the overall study. The first game trial was a practice trial in which participants experienced the same conditions. In the second trial the between-subjects factors were manipulated: social equality and status. The first factor 'social equality had two levels; equality and inequality. Status was nested within the social inequality condition and determined whether groups were of either of equal or low or high status. A total of 32 games were conducted overall, with a maximum of fourteen participants per game.

There were also two additional experimental constants included in the design of the study. The first were the individual or group resource balances. In conditions of equality all groups received 20 tokens at the start of the game. In conditions of inequality, high status groups began the game with 30 tokens while low status groups began with 10 tokens. The second constant were social the ties between players. These formed as a result of token exchanges. Both of these experimental variables were visible to all players for the duration of the game.

Study variables

The present research sought to study the effect of social structure on group behaviour. To do this certain variables were identified, manipulated. By noting how the manipulated variables affected the response variable, the researcher was able to test whether a causal relationship existed between the variables.

1) **Independent variables** (IV)

Independent variables, also called factors, are experimental variables that are manipulated in an experiment, and are assumed to have a direct effect on the dependent variables. These variables stand alone. In this study three independent variables were defined; group (group, individual), equality (social equality, social inequality), and nested within the social inequality condition was status (low status, high status).

2) **Dependent variables** (DV)

Dependent variables are those that a researcher measures after manipulating the IVs and are assumed to affect the DV. The DV in the current experiment was defined as 'outgroup giving'.

Sampling

The sample consisted of participants of various ages and gender drawn from the student population enrolled at the University of KwaZulu-Natal, Pietermaritzburg Campus. The study did not require a specific population and therefore a convenience sample method was employed, whereby participants utilized for the research were those freely available at the time and willing to take part in the study (Gravetter & Forzano, 2009).

Convenience sampling is a form non-probability sampling where selection of participants is based on the researcher's judgment rather than the statistical code of randomness (Terre Blanche *et al.,* 2006). Students available on the campus grounds during recruiting were

directly asked to participate in the research. This sampling method was especially suitable for this research due to its efficiency in gathering participants. Active recruiting of participants occurred only during the early stages of data collection. As knowledge of the study quickly spread among the students, recruiting was no longer required, and sign-up sheets were created and put up instead, where participants could sign up to take part in the experiments. The limitation to this sampling method however is that results in a sample are not truly randomly selected from the population.

Data Collection

Data collection took place between May and August 2013. The data were collected by a team of students, including the researcher, all involved in the larger study of intergroup behaviour. The present study only used a systematically defined subset of the data collected during this duration.

1. **Procedure**

Data collection took place at the Psychology Laboratory at the University of KwaZulu-Natal, Pietermaritzburg Campus. The laboratory consisted of two rooms; a larger room containing fourteen computers and a smaller separate room containing a 'control terminal' computer and a fingerprint scanner. The 'Give and Get' games were run on the network of computers in the laboratory. Before being led into the larger room, the right index fingers of the participants were scanned and saved. If an individual had previously participated this would be indicated on the computer and the participant was asked to leave.

After being seated at a computer informed consent was given and instructions explaining the "Give and Get" game procedure were offered. All participants then logged onto the computers which took them to the game. After being randomly categorised into groups by the software, participants proceeded with the game which involved them allocating one token per round to any member of their choice.

Once the game was complete participants signed the incentive collection sheet and collected their incentives. All information including the giver of the tokens, the receiver, the group information, time elapsed between giving as well as rounds and trials were all saved onto the programme for analysis.

Ethical Considerations

1. Sampling

Participants that were prepared to take part in the experiments received an incentive in the form of a twenty Rand note for simply participating in the research. The use of the incentive was essential to effectively encourage participation. Participation however was voluntary and no undue inducement took place. Informed consent included participants receiving appropriate information regarding the research and their roles before agreeing to participate (Gravetter & Forzano, 2009). The participants received forms providing simple information about the researcher and procedures of the experiment. On these forms participants could voluntarily decide whether or not to assent.

Very minor deception was used in the study whereby not all information regarding the purpose of the research was offered to participants at the beginning of the experiments. Specifically, participants also believed that they had been categorised into one of two groups based on their preference between two paintings. Group categorisation was in fact random. Deception through the aesthetic preference test was necessary so as to control for an extraneous variable, which was artist preference somehow affecting the token allocation of participants. Moreover, this deception was important to ensure that participants were equally divided into two groups as unequal groups would have resulted in a confounding variable. The participants were however debriefed and provided this information afterwards.

2. Data Collection

Although all information regarding participants was stored, their responses were not linked to their names or any other information by which they could be identified. In other words, participants remained entirely anonymous and their participation remained confidential. All data from the games was archived to be used in case of verification in the future. This possible use of data was made known to participants in the information sheet.

Validity, Reliability and Generalisability

Various strategies were implemented in order to ensure the internal validity, reliability and generalisability of the results of the present study.

1. Internal validity

Internal validity of research pertains to the ability to draw causal conclusions from the research (Terre Blanche, Durrheim, Painter, 2006). An internally valid design yields findings that are robust and replicable and where there are no confounds that might serve as plausible alternative explanations.

Deception was necessary for this research in order to observe behaviour as it naturally unfolds and to set up the minimal group situation. Any detailed information regarding the real purpose of the research if given to participants at the beginning of the experiments may have a potential influence the participants' performance yielding inaccurate findings as a result of response bias and threatening the internal validity of the study. Therefore offering vital information only after the games was necessary to achieve experimental control.

To prevent the same people from participating repeatedly a fingerprint scanner which kept record of all individuals who participated in the study was used during data collection. This was important for the validity of the study due to testing effects. Testing effects are the changes in participant behaviour during subsequent tests due to the reactive nature of participants in the experiments (Campbell, 1957). Repeated involvement in the study would also limit the generalisability of the results.

These reactive effects of participation may have posed a threat to the internal validity of the study. Participants were not provided detailed instructions regarding token allocations and were simply informed that they could adopt whichever strategies they wished to. Due to the repetitive nature of the experiment it was important to consider that participants may have unconsciously behaved in ways they thought the researcher anticipated, possibly affecting the outcome of the experiment.

Moreover, during data collection a team of experimenters were randomly assigned games to run to ensure reliability. This was necessary in order to prevent an experimenter effect during data collection which may have occurred if each experimenter collected data specific to their 'own' study.

2. Reliability

Reliability refers to ensuring that methods of data collection lead to consistent results (Terre Blanche, Durrheim & Painter, 2006). Reliability in this study was ensured by using measures

of ingroup favouritism; namely ingroup and outgroup giving as recorded reliably over a 40 game round period by the VIAPPL software.

The "Give and Get" game

1. Categorisation

After participants had been recruited they were invited to participate in a computer-based experiment game named 'Give and Get'. In the first part of the game, similarly to the original MG studies, participants completed an 'aesthetic preference test' by indicating their preference between two pieces of abstract art (Klee and Kandinsky) (*see Figure 4*). Participants were then ostensibly divided into one of two groups based on their chosen preference; this group categorisation was in actual fact random. While the psychology laboratory could accommodate up to twenty individuals, a maximum of fourteen participants were used per study. This was to ensure that there would be two perceptually distinct groups in all games and that the participant pool was not exhausted.

Figure 4: Klee and Kandinsky 'aesthetic preference test'

One of these paintings is by Paul Klee and the other is by Wassily Kandinsky. You will now be assigned to either the "Klee group" or the "Kandinsky group" based on the picture you choose. Please click on the picture you prefer.

2. Game Conditions

Group Condition

The participants played the game as either individuals (A) or as members of a group (B). Although the study sought to observe and draw conclusions solely about groups, an individual control condition was also created where participants were not categorised into groups. This design was implemented to enable comparison of results between individuals and groups which would possibly arise as a result of the categorization effect (Tajfel *et al.*, 1971).

In the group condition circular avatars representing the players differed in colour depending on the group categorisation. The colours yellow and purple (see *Figure 6*) for example represented two different groups in the intergroup condition. These circular avatars were all represented in one colour however when in the individual condition (see *Figure 5*).

Figure 5: Individual condition represented by single colour scheme
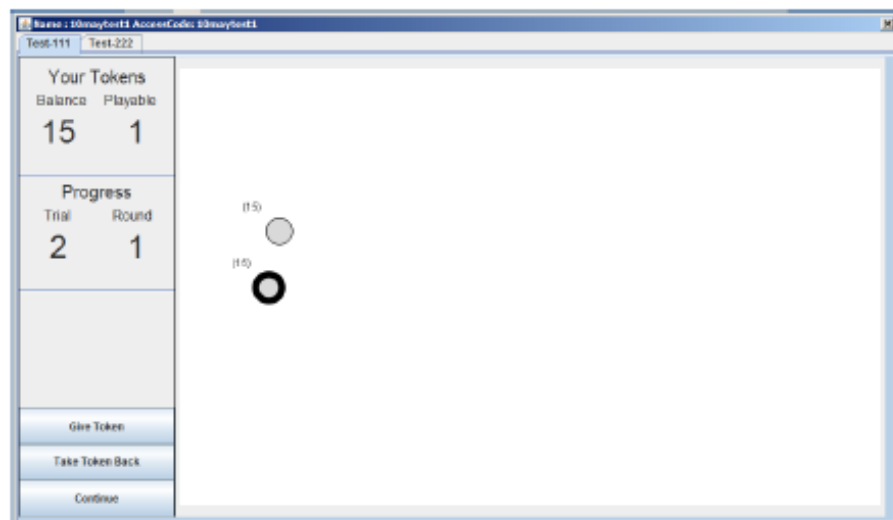
Figure 6: Intergroup condition represented by the yellow vs purple group
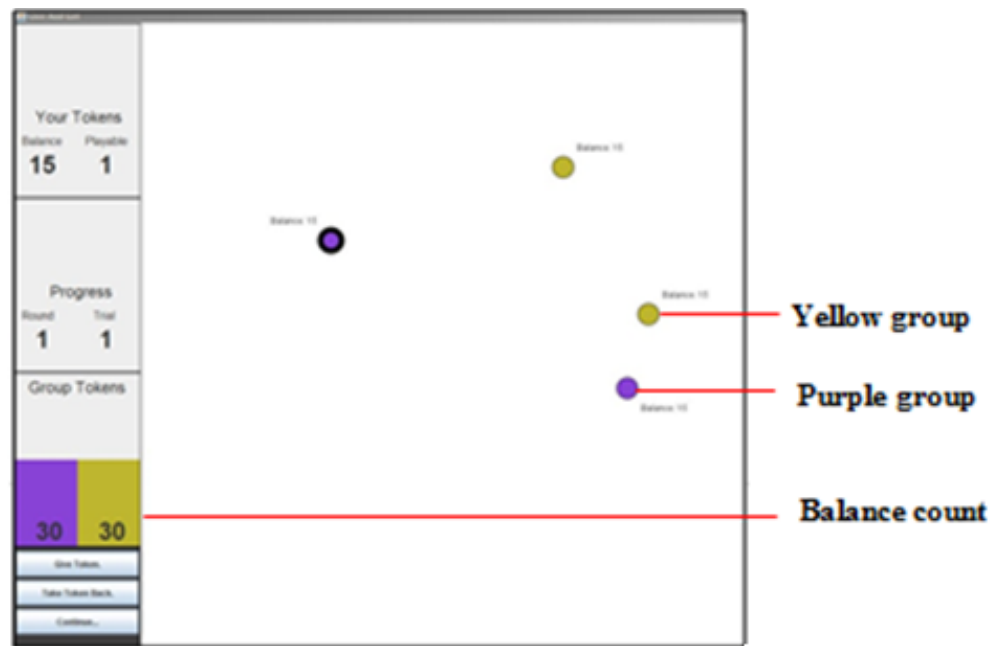
Equality condition

Each individual or group began the game with a set token balance. This balance depending on the status of the game would be evenly or unevenly distributed among the individuals or groups. For example in the inequality condition resources were allocated to players unevenly, some individuals or groups began the game with 30 tokens while others or those in the other group received 10 tokens. This starting balance was distributed among participants randomly.

Status condition (nested within social inequality)

In conditions of social inequality players could be socially ranked. This meant that players began the game with an uneven number of tokens and thus giving rise to low or high status rank. This occurred within both individual and group conditions. Using the aforementioned example, individuals or groups starting the game with a balance 30 tokens were of a high status, compared to those of low status that began with a balance of 10 tokens. The concept of 'social rank' however was not disclosed to participants.

3. Resource Allocations

Resource allocations were made by the players per round. Participants were told that they could distribute one token per round to any player in the game. In the individual condition

players could allocate tokens to other individuals or themselves, whereas in the intergroup condition they could make two types of allocations; to a member of their group (ingroup) or a member outside of their group (outgroup). Participants also had the option of allocating tokens to themselves (self-giving); and this act was still considered as ingroup favouritism. On the bottom left of the screen was a box indicating a balance count (see *Figure 5*) defining the amount of tokens the player began with as well as how many they had after each round.

Unlike previous MGP experiments the "Give and Get" game allowed interaction between participants. The game represented each participant as a small circular avatar. All avatars of the players were positioned in a circular arrangement on the screen. Each participant saw their own avatar represented with a bold outline. The group positioning of avatars alternated so that no participant was ever virtually positioned adjacent to an ingroup member.

To allocate tokens participants clicked on another circle (ingroup or outgroup member) of their choice. This circle was then bolded to represent their allocation choice. Players could change their allocation by simply clicking on another circle. Once having decided on whom to allocate the token to, a line illustrating a social tie between the two avatars appeared (see *Figure 7*). When all fourteen players had allocated their tokens a summary diagram (see *Figure 8*) was provided after each round, which illustrated how tokens within that round had been exchanged. In addition, the diagram displayed the accrued token balance for each player after each round.

Figure 7: Social tie represented in the group condition
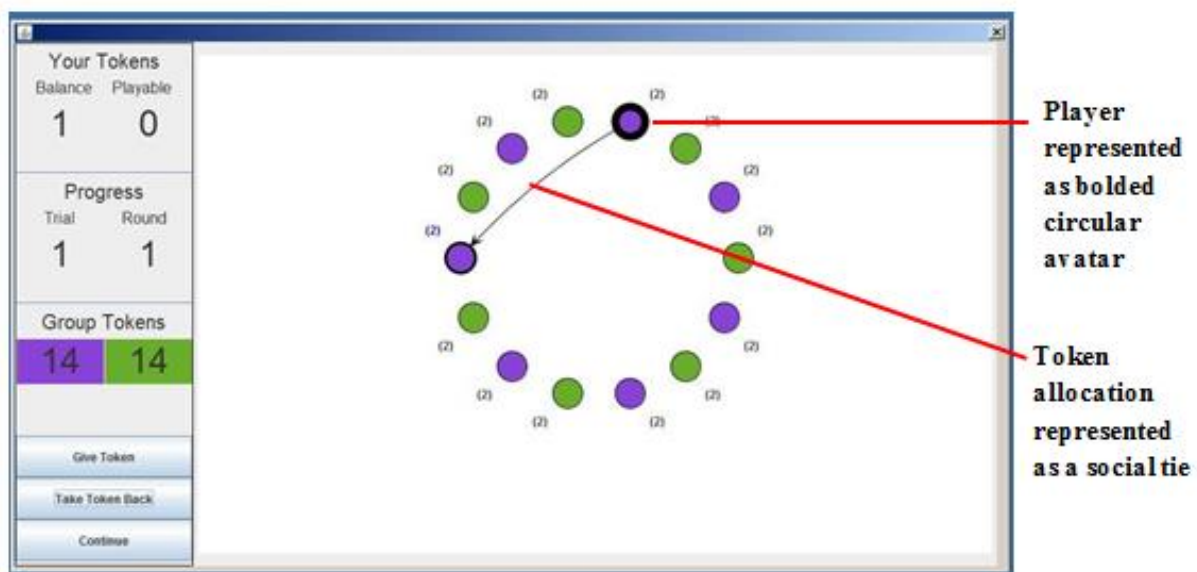
Figure 8: Summary diagram after each game round illustrating resources exchange between participants in the group condition
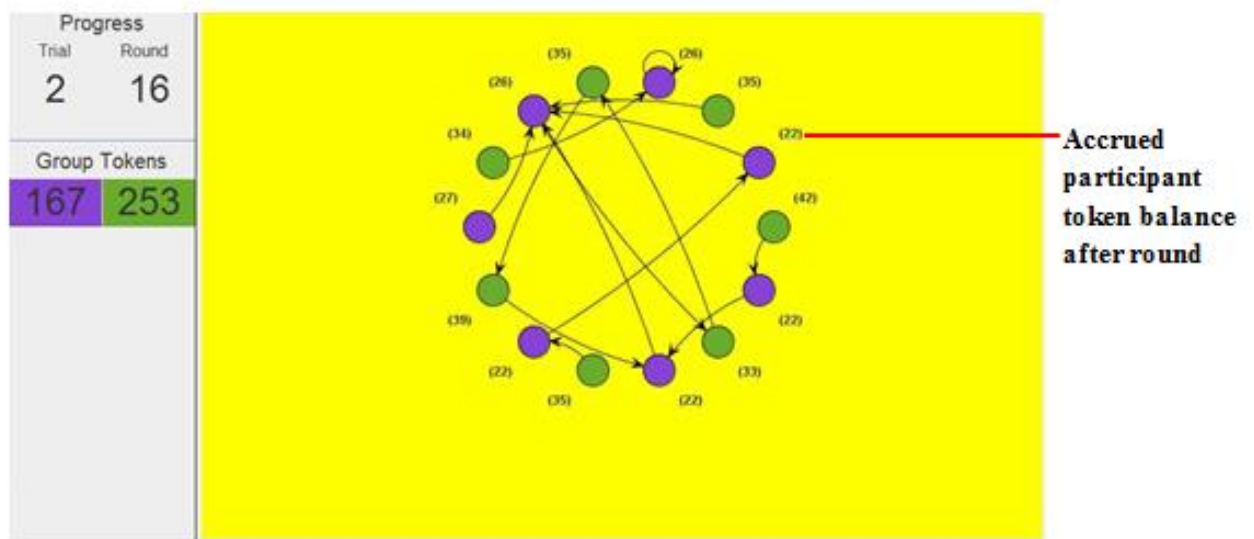
Chapter Five: Data Analysis

The research adopted a descriptive approach and strictly used a quantitative method. The Statistical Package for the Social Sciences (SPSS) was used to analyse interactions and flows between players to determine their token allocation strategies adopted during the games. More specifically, the study was concerned with measuring and reporting on patterns of outgroup giving among three precise conditions;

1. Group condition: where participants had played the game as either individuals (A) or as members of a group (B),
2. Equality condition: where resources depending on the status of the game had been evenly (social equality condition) or unevenly (social inequality condition) distributed among the individuals or groups,
3. Status Condition: in conditions of social inequality where individuals or groups were socially ranked as either of low or high status.

1. Outgroup giving

In order to measure ingroup favouritism the study measured instances of outgroup giving among the players. Players had the choice of either allocating tokens to members of their ingroups or the outgroup, however self-giving was also an option. Self-giving in this study was defined as the action where players allocated tokens to themselves. Although these acts were perceived and measured as independent responses in this study, they still fell under ingroup giving. As a result, ingroup giving was confounded with self-giving and thus requiring a more complex form of measurement. Outgroup giving however mirrored ingroup giving without self-giving, and was chosen as a more reliable measure of ingroup favouritism for the present study.

2. Coded Data: MS Excel

The data produced in the present study was of a quantitative nature. The data was recorded and saved by the Virtual Interactive APPLication (VIAPPL) and later exported to MS Excel. The recorded data that was already coded by the software was comprehensive and detailed and encompassed a variety of information.

3. Analysis: SPSS

The data from the game were imported to SPSS and coded appropriately. Overall this data included;

Game name, Equality (inequality or equality), Status (low or high status), Group (individual or group), Trial number, Round number, Participant ID, Tokens to ingroup (ingroup giving), and Tokens to outgroup (outgroup giving).

4. Binomial Data

The study experiment was binomial in nature. A binomial experiment is a one where there are a number of trials and where each trial is independent of the others. There are typically only two outcomes and the probability of each outcome remains constant from trial to trial (Andrews University, 2005). The data outcomes were for each round; two dependent variables (DV) were recorded for each player. These included:

1) Ingroup giving: yes (1) or no (0)
2) Outgroup giving: yes (1) or no (0)

5. Generalized Linear Mixed Model

In statistical analyses the usual principal is to apply the simplest statistical test and to ensure that it is applied accurately. In many cases however the series of assumptions upon which such tests are based are violated by real world experimental data such as in the repeated measures design of the present study. Assumptions generally violated for include; normality, homogeneity of variances and independence of data. In order to overcome these violations, the present study used the Generalised Linear Mixed Model (GLMM) to statistically analyse the binomial structure of the experimental data produced by the round-by-round token allocation design of the 'Give and Get' game.

GLMMs are a superset of Generalized Linear Models which combine properties of two statistical frameworks; the linear mixed models and generalized linear models. The GLLM procedure expands the general linear model so that the data are permitted to exhibit correlated and non-constant variability (Bolker, Brooks, Clark, Geange, Poulsen, Stevens & White, 2009). The mixed linear model as a result is flexible in that it allows for the modeling of data not only by means but also by variances and covariances.

The biggest advantage of GLMMs is that they allow for dependent variables to be samples from non-normal distributed data (Bolker *et al*., 2009). The 'generalised' aspect of GLMM means that in contrast to linear regression, the experimenter is able to take into account the distribution which underlies the process of generating their data. For example in the present study binomial data produced was identified (Bolker *et al*., 2009). Furthermore, the mixed aspect allows for random effects as well as some degree of non-independence among observations. In the long run, this type of flexibility within GLMM approaches allows for researchers to apply more rigorous, realistic statistical models to their data (Bolker *et al*., 2009).

The assumptions of GLMMs are as follows (SPSS, 2007)
- Dependent variables are linearly associated with fixed factors, random effects and covariates,
- the fixed effect models the dependent variable's mean,
- the random effect models the covariance aspect of the dependent variable,
- multiple random effects are independent of one another,
- the repeated measures models the covariance structure of the residuals,
- the dependent variable is produced from a normal distribution.

Chapter Six: Results

Generalized Linear Models (GLMM) with binary logistic regressions were run using SPSS to test outgroup giving across the experimental factors. This distribution was appropriate as variables represented a binary response. Independent variables; group and social equality conditions were tested on the outgroup giving dependent variable. A second analysis tested differences in outgroup giving across the status conditions. Game 'rounds' were specified as the random effect to model change over time.

The GLM tested for main effects, two-way ANOVA with the alpha set at 0.05 to assess the overall model significance. A Bonferroni's correction was used to limit family wise error across the tests.

6.1. Study variables

Independent variables

The first independent variable explored the effects of group categorisation/membership on token allocation strategies adopted by players. Group condition was the independent variable (IV) with two levels; 1) individual condition where participants had played the game as individuals only and 2) the minimal group condition where participants had been categorised in one of two groups and played the game as members of those groups

The second independent variable explored the effects of social equality on token allocations of participants. The Equality condition had two levels; 1) the socially equal condition where tokens had been equally distributed among groups at the beginning of games and 2) the socially inequality condition where tokens had been distributed unequally among the groups at the start of the games.

The third independent variable was the status condition nested in the social inequality condition, where an unequal distribution of tokens revealed groups of different statuses. This variable had two levels; high status and low status.

Dependent variables

The dependent variable (DV) in this analysis was the measure of outgroup giving, in other words, extent to which participants established less group-influenced strategies in their token allocation among one another.

6.2. Findings

1. Group Condition: Individual vs. Group condition

It was expected that the players in the group condition would be more likely to allocate their tokens in a group-like manner. This means that patterns of token giving that resembled less outgroup giving and thus "groupness", would occur more in the group condition as opposed to the individual condition. Results confirmed these predictions and displayed a significant fixed effect (F (13.3050=18.644, p= 0.000) for the analysis. Players in the group condition (M = 0.338) were less likely than those in the individual condition (M=0.507) to display outgroup giving. This meant that players in groups often allocated their tokens to members of their ingroups rather than the outgroup, whereas individuals who did not show such patterns in their token allocations. The individual condition instead yielded higher levels of outgroup giving, which represents idiosyncratic patterns of giving. The rate of these behaviours among players in the individual condition increased significantly over the rounds (β= 1.156, SE= 0.252, p=0.000). These findings confirm H1: that players categorised into groups will display patterns of "groupness" in their token allocations.

Figure 12: Outgroup giving pairwise contrast of estimated means for the Group variable
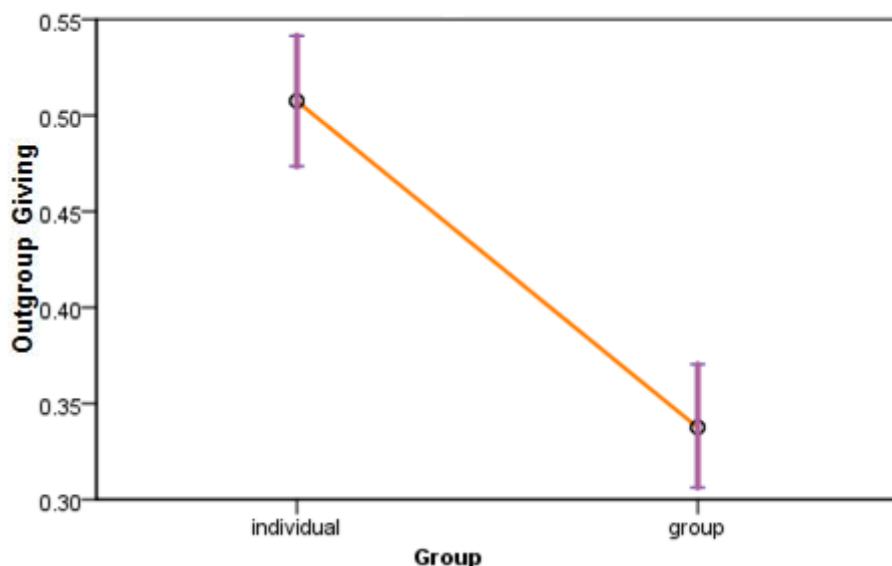
2. Equality condition: Social Equality vs. Social Inequality

Outgroup giving was investigated and compared between groups in the social equality and social inequality condition. Results however found no fixed effect for social equality on outgroup giving (F (13.305) = 20.828, p= 0.501). Nonetheless outgroup giving was found to be numerically higher among groups in the social equality condition and increased over the rounds (β= 0.061, SE= 0.024, p= 0.013). This means that groups in the social inequality condition engaged in less outgroup giving than groups in the social equality condition, and thus confirming H2.

3. Status condition: Low vs. High Status

Outgroup giving was investigated among low and high status groups. It was expected that low status groups would engage in less outgroup giving compared to high status groups and thus be more discriminatory. Results of the experiments displayed a significant fixed effect for status (F=20.828, df =13.305, p= 0.000). High status groups displayed significantly higher levels of outgroup giving (M: 0.471) than low status groups (0.371). In addition, outgroup giving increased among high status groups over the 40 game round periods (β= 0.959, SE=0.267) whereas in low status groups it did not. These findings confirmed H3; low status groups were more discriminatory than high status groups and engaged in less outgroup giving than high status groups.

Figure 9: Outgroup giving pairwise contrast of estimated means for the Social variable
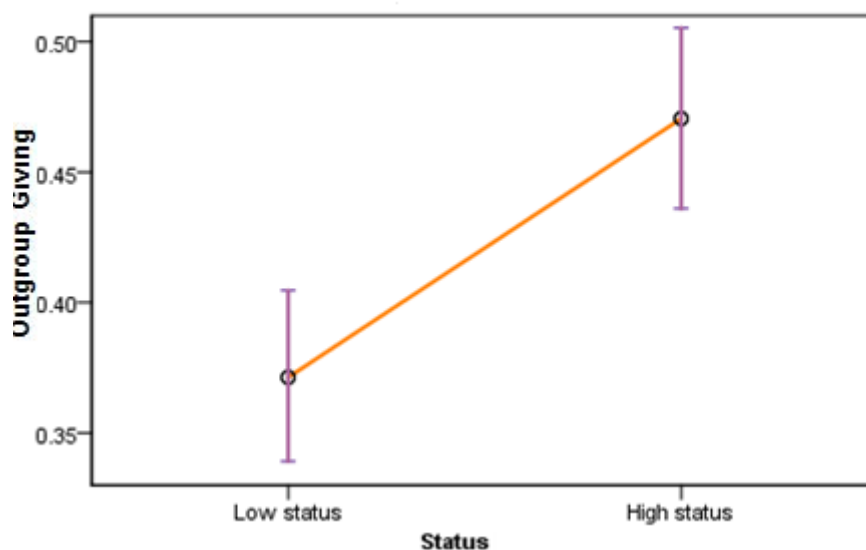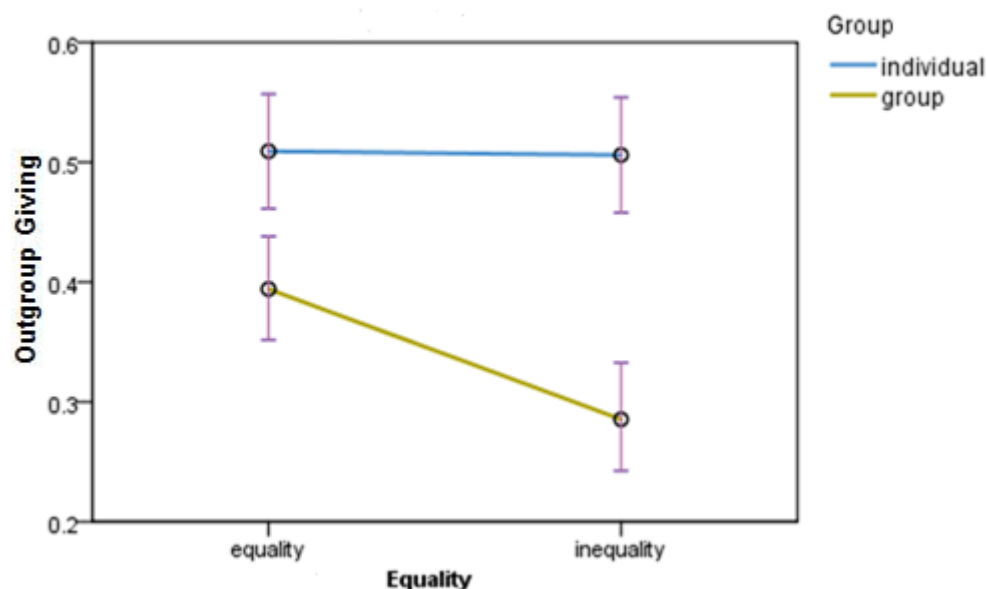
4. Interactions

1. Two-way interaction: group condition and equality condition

A test was run to determine if there would be an interaction effect between the equality and group conditions. Results yielded a significant interaction effect (F (13.3015) =7.945, p= 0.005). The effect of social equality differs as a function of the group condition. This meant that the difference in outgroup giving between individual and group conditions was highest in the social inequality condition. Groups in the social inequality conditions demonstrated the lowest levels of outgroup giving overall (M= 0.361). Groups in the social equality condition were more likely to display higher levels of outgroup giving (M=0.38). This demonstrated that patterns of token allocations among groups differed in various conditions of social equality. These results further confirmed H2. Outgroup giving among individuals in socially equal and socially unequal conditions varied slightly. Players in the individual conditions were most likely to engage in outgroup giving (M=0.509) (M=0.506).

Figure 10: Outgroup giving pairwise contrast of estimated means for the Social Equality and Group variable interaction
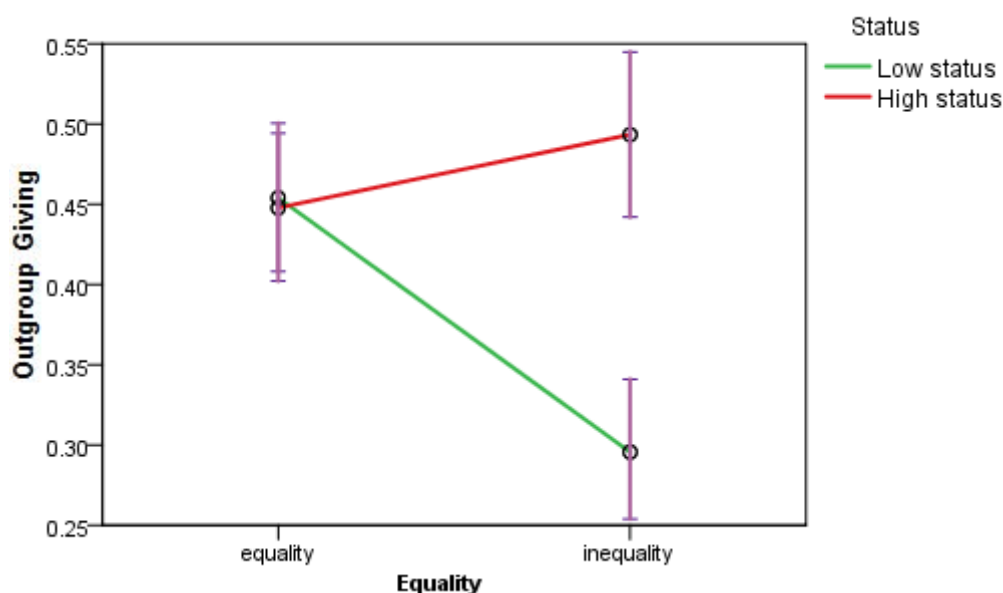

2. Two-way interaction: Group condition and Status condition

A test was run to determine if there would be an interaction effect between the status and social equality conditions. Results determined a significant interaction effect (F (13.305) =34.034, p= 0.000). A *disordinal* interaction was found between the two variables. The effect

of social equality differed as a function of status. That is, the difference in outgroup giving between low and high status groups conditions was highest in the social inequality condition, confirming both H2 and H3. High status had the biggest effect on outgroup giving and these groups engaged in the highest levels of outgroup giving (M= 0.48). Outgroup giving was lowest among low status groups (M=0.296), suggesting that these groups showed the greatest levels of ingroup favouritism overall in the study, as they were the least likely to share their tokens with the outgroup giving. There were no notable differences in outgroup giving among groups in the equality condition (M=0.46, M=0.44).

Figure 11: Outgroup giving pairwise contrast of estimated means for the Social Equality and Status variable interaction

3. Two way interaction: Group condition and Status condition

The final test was run to determine if there would be an interaction effect between the status and group conditions. The results of the analysis yielded a significant interaction effect between the two conditions (F(13.305) =7.038, p= 0.000). Findings displayed that the biggest difference in outgroup giving occurred among individuals and groups of high status. High status groups (M= 0.366) were more likely than low status groups to engage in outgroup giving (M= 0.321). Outgroup giving among low status groups was the lowest overall status groups and individual players, suggesting that these groups were most discriminatory. This confirmed H3.

Figure 12: Outgroup giving pairwise contrast of estimated means for the Status and Group interaction
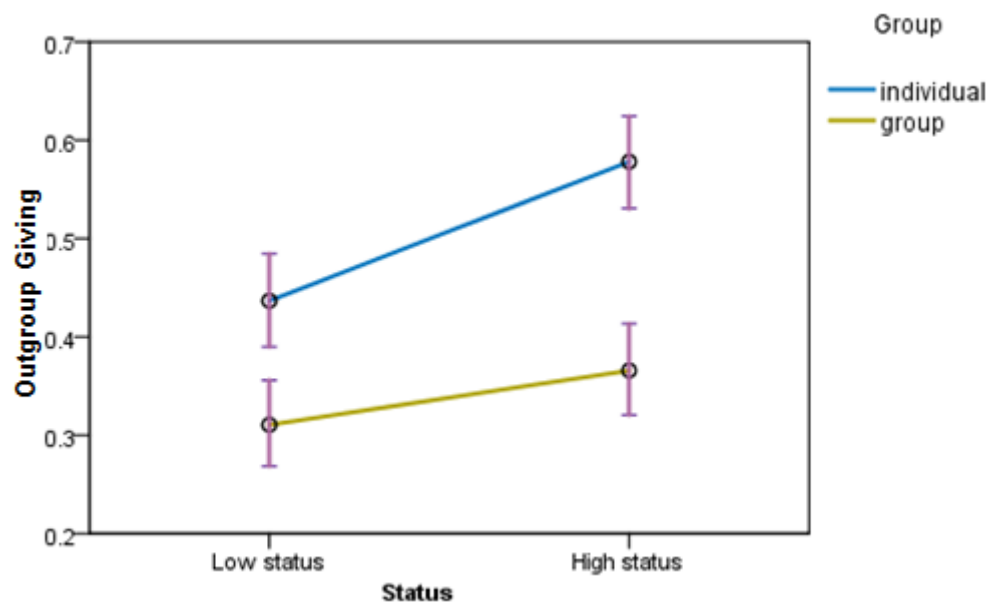
Chapter Seven: Discussion

Previous knowledge around groups had claimed that they are a reflection of people who share common goals and identities (Sherif, 1936). Tajfel, Billing, Bundy & Flament (1971) however believed otherwise and created experiments that would study the most basic conditions necessary for the formation of a group. According to the scholars, "groupness" would be demonstrated by behaviour that resembles ingroup favouritism and outgroup discrimination (Brown, Tajfel & Turner, 1980). The results of the minimal group study confirmed their expectations. Groups displayed significant behaviours of ingroup favouritism, even at the expense of the outgroup. It was concluded as a result that the simple act of categorising people into groups is enough to prompt group-like behaviour in favour of the ingroup (Allen & Wilder, 1975).

The present research along with other scholars however argued that results of these studies are problematic primarily because of the manner in which the idea of a group was conceptualised and consequently operationalized (Aschenbrenner & Schaefer, 1980; Durrheim, Quayle, Tredoux, Titlestad & Tooke, 2016; Karp, Jin, Yamagishi & Shiontsuka, 1993;). The research argues that groups are far more intricate than individuals simply sharing a social category. Instead groups are social systems that contain processes and dynamics that resemble meaningful information as individuals interact with one another (Bordia, DiFonzo & Chang, 1999; Goffman, 1959;). Therefore, interaction is an essential building block of groups and group behaviour.

The present research replicated the MG studies rather in an interactive platform, whereas the original studies' utilised pen and paper methods that did not allow interaction between participants. This method of study as a result allowed for minimal groups to be studied in environments that could start unravelling the many complex processes that occur in group settings that the classic studies overlooked. The findings of the study distinctly revealed the normative nature of social activity that occurs amongst groups. Moreover, these patterned activity when observed across the conditions were shown to differ in comparison as a result of the experimental conditions.

Social Identity Theory (SIT) was later developed to further expand on the findings of the MG studies and offered psychological interpretations of the likelihood that members of groups will lean towards favouring their ingroups. The theory claimed that groups gives rise to a

social identity, which was referred to a person's self-concept of who they are based on their group membership (Tajfel & Turner, 1978). Due to the fact that social identity contributes to feelings of self-worth, the theory proposed that people as a result would be motivated to favour their own groups. There has been other research however that has demonstrated that status moderates people's social identity, to the extent of influencing whether or not members actually favour their ingroups over the ougroups (Ellermers, 1993; Hertal & Kerr, 2001;Scheepers & Ellemers, 2005). These effects of status were unfortunately not explored in the MG studies since all groups were implicitly of equal status. The present research incorporated this aspect to its design, and tested the influence of status on the token giving patterns of the groups in various contexts of social equality. This section presents the discussion of the results of the study.

1. Re-envisioning the MG studies through interactive platform

To study group behaviour under minimal conditions, the classic MG studies used a pen and paper task as their methodological instrument. On the paper were matrices containing a top row for allocations made to the ingroup and the bottom row contained those for the outgroup. After having been categorised participants simply had to allocate resources to another member of either the ingroup or outgroup. Allocation strategies were provided for how participants could allocate their rewards. These were arranged in such a way that one could either choose between fairness, maximum joint profit, ingroup favouritism or outgroup favouritism (Tajfel *et al.,*1971). This methodology however has been criticised by scholars who believe that by having removed interaction from the design of the experiments, the studies became too minimal and failed to capture the characteristic features of social processes involved in the formation and activity of groups (Sutton & Douglas, 2013; Durrheim *et al.,* 2016,). Secondly, it is supposed that extreme arrangement of scores between the ingroup and outgroup on the matrices elicited the general responses of ingroup favourisitsm from groups, suggesting the presence of demand characteristics and forced choice (Brewer & Silver, 1978; Bornstein *et al.,* 1983a; Aschenbrenner & Shaefer, 1980; Harstone & Augoustinos, 1995).

The present research supported the need to re-envision the studies in a context that addresses these concerns (Durrheim *et al.,* 2016). VIAPPL – a technological platform that facilitates interaction between minimal groups was utilised instead for the research. The software replicated the studies in the form of a basic experimental computer game. Groups in this

setting could not only actively interact with one another, but their interactions were also made visible in the form of social networks and ties. This served as an advantage as it illuminated the dynamic nature of group processes involved in group formation and behaviour. The experiments were also run over a multiple game periods, which allowed for the temporal aspect of social activity to be captured (Durrheim & Quayle, 2012). This design did not implicitly or explicitly impose limits on the participants they instead were free to determine their own responses.

2. Ingroup favouritism

Ingroup favouritism in the experiments encompassed every act of ingroup giving that occurred during games. In other words, this constituted every time that a member of a group gave a token to a member of their own group. The design of the games also allowed for participants to allocate tokens to themselves and this was referred to as self-giving. Self-giving was a startling finding because of its unexpected occurrence. The strategy emerged normatively among players without plan and was neither encouraged nor discouraged. It was believed that self-giving was adopted with intentions of maximizing independent gain. Self-giving was confounded with ingroup giving and as a result posed constraints on the measurements of ingroup favouritism. The present research as a result used outgroup giving as a more reliable measure of ingroup favouritism because it mirrored ingroup favouritism without self-giving. Outgroup giving referred to every act where members allocated their tokens to members of the outgroup. Consequently, these behaviours could be used to interpret whether groups were more likely to favour their ingroups. That is, if they displayed less actions of outgroup giving that means they were more likely to allocate their tokens to members of their groups.

2.1. Testing the social categorisation theory

In order to confirm the conclusions of the MG studies, that group behaviour can arise even in the most minimal conditions due to social categorisation, the present research sought to test this. Experiments were conducted in two specific conditions. The first was the individual player condition where players during the games were all represented by the same coloured avatar (e.g. grey). This means that players has not been categorised into groups. Contrarilyin the group condition, half of the players were represented by purple avatars, while the other

half was represented by a yellow avatar. This means that players had been randomly categorised into one of the two groups.

The findings of the experiments displayed distinct differences in the patterns of token giving among the conditions. The individual player condition yielded no evidence of an arrangement of ongoing and group relational ties between players. Instead interactions in this condition were rather a series of idiosyncratic exchanges between players that did not necessarily highlight any discrete patterns. In the group player condition however, distinct and sequential patterns between players were identified. Relational ties tended to represent arrangements between players that shared the same coloured avatars. This meant that interactions of players categorised into groups were more likely to resemble "groupness" – the sense of belonging or sharing relational connectedness. The MG studies defined this phenomenon as ingroup favouritism. Therefore these findings confirmed the H_3 of present study as well as claims made by the original studies that categorisation of people into groups and the mere knowledge of the existence of another group, is adequate to trigger intergroup competitive responses. These responses would most likely resemble members favouring their own groups, even at the expense of the outgroup (Tajfel *et al.,* 1971; Tajfel & Turner, 1979; Brown & Gaertner, 2001).

3. Social ties, norms and the evolving nature of group interactions

In seeking experimental control the MG studies removed many factors they deemed unnecessary for group behaviour, including interaction. It has been contested however that the studies may have been too minimal (Sutton & Douglas, 2013; Durrheim *et al.,* 2016). Some scholars argue that groups are typically marked by processes that emerge, evolve and are established over time as groups interact with one another (Goffman, 1959; Lewin, 1943a;, Veenstra & Steglich, 2011). Therefore groups generally feature social ties between members that are created by on-going interactions and feedback processes, as members of groups engage and make meaning of these interactions (Durrheim *et al.,* 2016).

The present study adopted this line of thinking and as a result used an interactive experiential software as a platform for investigating group behaviour. Findings of the study determined that token allocations among groups followed active and sequential patterns. When observed over the course of the 40 game round periods, findings also demonstrated that certain patterns of interactions gained momentum and were strengthened among groups over time. These

evolving features of the patterns of interaction over time were indicators of change processes involved in group behaviour (Arrow, Poole, Henry, Wheelan & Moreland, 2004). These patterns represented 'norms' that emerged and solidified as members of groups negotiated acceptable behaviours and consequently conformed. As a result, the research provided evidence for the dynamic and interactive nature of group behaviour and the substantial role that normative social influence as a group process plays as members of groups make meaning of their interactions (Doyal & Harris, 1986; Goffman, 1959; Hertal & Kerr, 2001; Thibaut & Kelley, 1959;). Therefore, interaction served as a medium through which information could be communicated between groups and norms diffused. Thus interaction as a conduit of social influence and an essential component of group formation and behaviour was evident. These findings confirmed arguments challenging the MG study conceptualisation of groups as social categories rather than systems in which individuals are active in creating and making meaning of their behaviours through interaction (Douglas & Sutton, 2013; Durrheim *et al.,* 2016).

4.   Influence of status on token giving behaviours of groups

Social Identity Theory (SIT) claimed that people internalise their group membership and begin to define themselves in group personas which in turn binds them to their groups (Tajfel & Turner, 1979). Research however has shown the effects of status in moderating people's social identities and thus whether or not they will favour their own groups over the outgroup (Bettencourt, Dorr, Charlton & Hume, 2001; Ellemers, 2003; Ellemers, Wilke & van Knippenberg, 2003;). Rabbie, Schot and Visser (1989) believed that ingroup favouritism in the MG studies rather reflected participants' desires to gain as many rewards as they could as opposed to seeking to enhance their self-esteem. The current research studied this influence of status on minimal groups, since groups in the original studies were implicitly of equal status and this aspect was not explored. The experiments set up conditions of social equality and inequality and observed resultant group behaviours.

Findings of the study revealed that status significantly affected the token allocations of groups, influencing the extent to which members favoured their ingroups. There were clear differences in patterns of token giving between groups in the social equality and social inequality conditions. Groups in conditions of social equality were more likely to share their tokens with members of the outgroup, with this norm also increasing and solidifying over the rounds. Groups however in conditions of inequality engaged less in these behaviours. As a

result, groups in unequal status environments more likely to favour members of their ingroup. These findings confirmed the second hypothesis of present the study. They also were in line with research asserting that in contexts of social inequality, where status differentials are salient between groups, intergroup discrimination is accentuated and intergroup relations are often marked by ingroup favouritism and outgroup antagonism (Ellemers, Wilke, van Knippenberg, 1993; Scheepers, Spears, Doosje & Manstead, 2006; Smith, Jackson & Sparks, 2003). Furthermore, results supported research that has shown that intergroup bias is often reduced in environments of social equality (Gaertner, Dovido, Anastasio, Bachman & Rust, 1993; Harding & Hogrete, 1952; Pettigrew, 1998).

4.1. Are high status or low status groups more discriminatory?

It is believed that in intergroup relations status impacts upon the perception of a group's worth. Groups ranking high in status are said to view themselves more highly than low status groups and as a result are more likely to favour their ingroups over the low status outgroups. For these reasons scholars argue that high status groups would be more discriminatory than low status groups (Ellemers, 1993). Similarly low status groupsare likely to disassociate themselves from their groups and favour the high status outgroup due to the low status ranking threatening their self-worth (Jost, 2001; Jost & Hunyady, 2002; Jost and Burgress, 2002; Jost, Pelham & Carvallo, 2002).

The present research studied which of the two groups between low and high status groups would show higher levels of ingroup favouritism and thus be more discriminatory. Findings of the study determined that outgroup giving occurred significantly more among high status groups than low status groups. This meant that high status groups were more likely than low status groups to share their tokens with the outgroup. Moreover, members of high status groups conformed increasingly to the norm of outgroup giving, as these behaviours were found to increase and over the period of game rounds. Low status groups on the other hand were the least likely, of all groups in all experimental conditions, to share their tokens with outgroup members. Very low levels of ougroup giving were found among this group. These findings confirmed the third hypothesis of the study that low status groups engage in more ingroup favouritism compared to high status groups, and thus be more discriminatory. As a result, the findings disputed research claiming that high status groups are bound to be more discriminatory because high status boosts feelings of worth (Bettencourt et al., 2001; Hewstone, Rubin & Willis, 2002; Mullen, Brown & Smith, 1992;;). Moreover, the findings

also challenged research suggesting members in low status groups distance themselves from their groups and in turn favour high status outgroups (Jost & Burgess, 2002; Sachdev & Bourhis, 1985, 1991).

4.2. Challenging or maintaining the status quo through social competition

Groups may generally resort to ingroup favouritism due to an internal instinct for self-preservation and the pursuit for a more positive social identity (Commins & Lockwood, 1979). Ingroup favouritism however also represents a form of identity conflict between the two groups as they fight for the top spot in the social relations (Maiese, 2004). The present research investigated the behaviours of high and low status groups in light of literature of social competition between groups of unequal status.

Findings of the study demonstrated that low status groups were less likely than high status groups to allocate their tokens to the outgroup. This difference was by a substantial amount. Consequently this meant that low status groups engaged in substantial levels of ingroup favouritism. In the context of social competition these findings were interpreted as demonstrating competitive behaviours by low status groups to possibly challenge the status quo (Rubin, Badea, & Jetten, 2014; Scheepers, Spears, Doosje & Manstead, 2006; Wright, Taylor, Moghaddam, 1990;). High status groups conversely engaged in higher levels of outgroup giving, and thus were less likely to favour members of their ingroups in their token allocations. These behaviours from high status groups in contrast meant that they refrained from competing with low status groups in order to try and maintain their status (Scheepers & Ellemers, 2005).

Explicit expressions of ingroup favouritism among low or high status groups are believed to be largely influenced by whether groups perceive status relations as just or unjust (Bettencourt et al., 2001; Ellemers & van Knippenberg, 1997; Scheepers *et al.,* 2006;;). In the present research, status was assigned randomly to groups, meaning that in light of this literature it is possible to assume that players most likely viewed the status relations as undeserved. The very high levels of ingroup favouritism amongst low status groups was therefore interpreted as these groups mobilizing as collectives to compete with high status groups for structural change, since the relations were unmerited (Ellemers, 1993; Tajfel & Turner, 1986; Turner & Brown, 1987;). Contrarily for high status groups, the unjustified status relations between the groups made them more willing to share their tokens with the low status outgroups. These behaviours among high status groups hypothetically challenge

research that claims that because the prospect of the social hierarchy being re-arranged members of high status groups will *always* seek to protect their status by demonstrating high levels of ingroup favouritism, regardless of how status relations were established (Ellemers, 1993; Mullen *et al.*, 1992; Scheepers & Ellemers, 2005; Taubervan & Leeuwen, 2012).

Chapter Nine: Concluding remarks

This thesis provided a critique of the Minimal Group (MG) studies which have been a pioneer in group research. The classic studies had concluded that the social categorisation of people into groups alone is necessary to trigger group behaviour, which often results in ingroup favouritism. In the present study it was argued that the methodological design of the classic studies may have been too minimal, to the extent that groups were in fact not representative of every day group contexts. In pursuing experimental control the original studies removed interaction from their investigations of group behaviour. This research along with many other scholars however maintained that actual groups are characterised by relational ties between members that are created by temporal and on-going interactions (Bordia, DiFonzo & Chang, 1999; Durrheim, Quayle, Tredoux, Titestad, & Tooke, 2016; Goffman, 1959; Sutton & Douglas, 2013). Due to the fact that the MG studies omitted this aspect from their design the characteristic and more complex processes involved in the formation of groups and group behaviour was not analysed (Arrow, Poole, Henry, Wheelan & Moreland, 2004). The present research instead aimed to illuminate these processes as well as study the phenomenon of ingroup favouritism highlighted by the original studies in contexts of varying social status.

The study used the Virtual Interactive APPLication (VIAPPL) to replicate the MG studies in an interactive environment. The software which reproduced the experiments in the format of computer games made it possible to achieve this aim. The data from the experiments fulfilled expectations of the research and were able to visibly display patterns of behaviour unique to groups as they unfold in time and space during interactions. The nature of the design allowed for the observation of group behaviour over a series of rounds rather than a once off event. Consequently, the data demonstrated the temporal and shifting nature of group behaviours in which individuals are active in producing, as they interact with one another and make meaning of their behaviours. Furthermore, the interactions among groups generally resembled normative patterns which often gained momentum as more members conformed to behaviours. This normative nature of group behaviour has been well established (Hertal & Kerr, 2001; Rimal & Read, 2005; Sherif, 1936; Ach, 1951). As a result, the present research built on this evidence to further highlight the evolutionary quality of group behaviour through processes of negotiated interaction.

Apart from the social categorisation theory, the scholars of the MG studies offered the Social Identity Theory (SIT) as an explanation to the study's findings. The theory claimed that people's social identities which arising when assigned to groups contributes to feelings of self-worth and increases the likelihood of ingroup favouritsim (Tajfel & Turner, 1978). Evidence has shown however that status often influences these social identities, which as a result affect whether or not members favour their own groups over the outgroup (Ellemers, 1993; Ellemers, Wilke & van Knippenberg, 1993;). The original MG studies did not capture this aspect as groups were implicitly of equal status. This present study, in contrast investigated the influence of status on the behaviours of minimal groups in an interactive environment. VIAPPL allowed for group experiments to be conducted in conditions of both social equality and social inequality in order to compare the arising patterns of behaviours. The data found differences in group behaviours among the two conditionsAs hypothesised, groups in socially unequal conditions were marked by ingroup favouritism and outgroup discrimination, whereas groups in socially equal conditions were more cooperative and shared their resources with the outgroup. Moreover, in conditions of social inequality low status groups were the most discriminatory and engaged in more frequent behaviours of ingroup favouritism, whilst high status groups displayed more willingness to distribute their tokens to members of the outgroup. As a result all hypotheses of the study were supported. VIAPPL proved to be a successful platform for achieving the aim and objectives of the present research. The recently designed experimental technology can be recommended to social psychological researchers that seek to further investigate social behaviour and communication between groups. The interactive design to studying groups yields social action that is not only in context but also highlights the active nature of individuals and groups as they build relations with one another over time to produce behaviour that is meaningful. Having practically demonstrated the methodological strength of this platform, the present research through its distinct approach consequently hopes to build renewed understandings and discoveries into existing research on social groups.

Chapter Ten: Limitations and Recommendations

This section presents and discusses the limitations of the present study. Challenges experienced pertain to; weaknesses associated with using computer-based experimental designs, analysing non-normal experimental data and difficulties in generalising study conclusions. It also offers recommendations to the identified problems.

Weaknesses in computer-based experiments

1. Artificiality of experimental results

One of the primary disadvantages of computer-based experiments is their artificiality. Some scholars argue that because computer simulations are unrealistic depictions of real life situations, they threaten the internal and external validity of research (Lowenstein, 1999). The replication feature typical of experiments is largely considered as not characteristic of everyday life (Lowenstein, 1999). These concerns raise questions around whether "the stylized form of experimental institutions allow for conclusions pertaining to the 'real world'" (Schram, 2005, p. 227).

The experimental context of the "Give and Get" game was designed to induce the simplest conditions for meaningful interaction. However, within this minimal and representational environment resources carried no real value to participants. It is essential therefore to note that while some results were found to be significant, the allocation strategies adopted by participants may not have accurately and realistically depicted real life decision making as computer controlled contexts may stimulate more rational approaches to decision making and judgement that participants might not necessarily use in real life situations (Lowenstein, 1999).

It is also imperative to note that analytic techniques do not always produce meaningful results (Lowenstein, 1999). While all token allocations and outcomes were captured by the VIAPPL software and interpreted, this information was exclusively of a digital and quantitative nature. The beliefs, attitudes and motivations behind participant allocations to further explain findings however were unobservable and missing from this interpretation. Understanding participant internal motives are essential for a holistic and reliable interpretation of results. For these reasons a qualitative component to the research is recommended, possibly through the use of a questionnaire or focus group in order gauge the reasoning behind observed behaviours.

Another restraint relates to user interface; which is the communication between the experimental participant and the computer. As simple as it was, the "Give and Get" game was technically limited only to those familiar with or unintimidated by computer machines. It is recommended therefore that in order to minimise issues associated with computer anxiety and intimidation, screen designs must be kept simple. As in the present study which implemented a trial run, participants similarly should have an opportunity to practice skills required in the experimental task to ease concerns.

A key limitation of computer-controlled experiments involves problems with the machines themselves. At times deficiencies associated with the software were experienced and as a result experiments had to be started over or cancelled. Redoing experiments sometimes caused participants to be impatient, posing a threat to the internal validity of the study. It is therefore recommended that pilot tests be conducted in order to determine and debug any potential problems. As in the present study, it is also suggested that a small number of computers be used for experiments in order to avoid such concerns. Regardless of the suggested solutions the drawback associated with dealing with computers is that hitches may arise unexpectedly which is often out of the experimenter's control.

Analysing non-normal experimental data

1. Dealing with binary data

When working with experimental data, tools for analysing and interpreting the data generally fall outside the range of methods often taught in introductory statistical methods (Bolker, Brooks, Clark, Geange, Poulden, Steven, & White, 2009). Non experimental studies often use normally distributed data which involve simple statistical methods which are straightforward to analyse and interpret. However the data produced in this study was binary. Binary refers to data where for each observation the data takes on two values (Bolker *et al*., 2009). For example in this study; the presence or absence of ingroup favouritism was binomial data with a single individual per observation. Unlike normal data, binary data provides more of a challenge. Advanced methods of analysis are often required which involve determining as well as fitting a model to the data.

Another problem associated with binary data involves random effects. Random effects encompass variation among participants when multiple responses are measured per individual (Bolker *et al*., 2009). In this study, random effects were produced when token allocations

were measured on the same participants over game rounds and trials. Therefore, along with measuring the effects of certain predictor variables, this variation among units also had to be taken into account and measured. When faced with binary data some researchers may opt to ignore random effects altogether, however such shortcuts may fail and even when 'successful', they often violate statistical assumptions or limit the scope of inference (Bolker *et al.,* 2009).

2. Generalized Linear Mixed Models analysis

This study used the Generalized Linear Mixed Model (GLMM) to statistically analyse the experimental data from the "Give and Get" game. GLMMs are powerful in that they do not violate any of the aforementioned statistical assumptions (Bolker *et al*., 2009). They are also considered as one of the best tools for analysing binary data that involves random effects; however they can also prove to be quite a challenge.

There is currently relatively limited literature and resources,such as video tutorials on the models and how to conduct them specifically for one's data. As a result, GLLMs may be difficult to implement. It was also noted that there is currently a lack available software packages to run the models. The present study utilised the Statistical Package for the Social Sciences (SPSS) to run the GLMMs, however this involved multiple trial and error methods as few guidelines were provided by the software on how to use and run the models.

The estimation of the parameters of a statistical model is fundamental in many statistical analyses. Within GLMMs these parameters include the fixed-effect parameters (effects of covariates, differences among treatments and interactions) and random-effect parameters. For GLMMs, calculating these estimates was "at best slow, and at worst (e.g. for large numbers of random effects) computationally infeasible" (Bolker *et al.,* 2009, p. 133). Although the models ran successfully, the average time taken to run each model was approximately between 8-12 hours. GLMMs are also known for being challenging to fit and statistical inferences such as hypothesis testing are often difficult to implement (Bolker *et al*., 2009). Selecting the best fit model in this study involved running multiple tests and selecting the test with the lowest Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC). However, the accuracy of this method was uncertain.

Interpretation of the data output similarly was problematic, and involved intensive familiarisation with GLM/GLMM theory. The researcher often had to exercise considerable

care in interpreting estimates and inferences. The overall experience of using GLMM although highly beneficial was regarded as a meticulous and tedious process. For these reasons it is recommended that researchers seeking to utilise this method proceed with caution before venturing into using GLMMs. It is also recommended that researchers receive considerable training beforehand for the understanding of theoretical underpinnings of GLMMs and using the appropriate software (Bolker *et al*., 2009).

Generalisability of study results

The sample used in the study consisted only of students enrolled at the University of KwaZulu-Natal who had volunteered to participate. By limiting the sample to one population the generalisability of study results were restricted. As a result, the extent to which the results of this study would arise among other populations is uncertain. Had the sample been drawn from a non-student population across several strata, it is possible that the subsequent data set may have contained variation as a result of multiple consistencies within the demographic (e.g. differences in computer user abilities of the participants).

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