Self-interest vs Group-interest: Rich and Poor group members exchange behaviour of experimental dollars under Individual Mobility and Group Mobility experimental conditions

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Abstract

Background: Social Identity Theory (SIT) defines the factors that create social groups and the impact these social groups have on our behaviour in different social dilemmas. Therefore, depending on the situation and the position of an individual's social group, it can result in an individual engaging in either self-interested behaviour – which is highly detrimental to other individuals but highly beneficial to oneself; or group-interested behaviour – which is highly detrimental to other groups but will privilege their own group. ***Aim:*** The aim of this research dissertation was therefore to explore the conditions which result in individuals being self-interested or group-interested in an economic social dilemma. ***Methodology***: Virtual Interaction Application (VIAPPL) was used to create a social environment which had a *High Status* and *Low Status* group and the presence or absence of Social Mobility/Change. A total of 60 experiments were conducted over 10 rounds across four experimental conditions. In each *Get Rich Game*, there was a group of 8 participants which resulted in the entire sample of 479 participants. The allocation behaviour of experimental dollars was imported into a statistical processing software (R) and analysed with multilevel modelling (MLM). ***Results:*** Descriptive statistics and modelling produced results for *Ingroup Bank*, *Outgroup Bank*, and *Outgroup Individual* exchange behaviour. The findings suggest that *Individual Mobility* and *Status* are the factors which affect self-interested exchange behaviour or group-interested exchange behaviour. The effect of *Individual Mobility* results in less investing in the *Ingroup Bank* but more donating and trading with the *Outgroup Bank* and *Outgroup Individual* respectively. This seems to suggest that the condition of *Individual Mobility* results in the perception of Social Mobility which makes participants take part in self-interested exchange behaviour. The effect of *Status* is that the *High Status* results in less investing to the *Ingroup Bank* but more trading with the *Outgroup Individual*. Therefore, *High Status* results in greater self-interested exchange behaviour. A *Low Status* results in more investing to the *Ingroup Bank* but less trading with the *Outgroup Individual*. Therefore, *Low Status* results in greater group-interested exchange behaviour. ***Discussion/Conclusion:*** Social identity processes of positive distinctiveness and categorisation are what motivated participants to take part in group-interested exchange behaviour. Whereas, intergroup compensatory helping and social encounters being on the interpersonal end of the interpersonal-intergroup continuum are what motivated participants to take part in self-interested exchange behaviour. Therefore, this evolutionary approach to study exchange behaviour showed that *Status* and *Individual Mobility* produce either self-interested exchange behaviour or group-interested exchange behaviour in asymmetrical groups.

Keywords: Social Identity Theory; Economic Social Dilemma; Self-interested Exchange Behaviour; Group-interested Exchange Behaviour; VIAPPL; Quantitative; Factorial Design; Rich Group; Poor Group; Social Mobility; Social Change; Get Rich Game; R; Multilevel Modelling (MLM); Individual Mobility; High Status; Low Status; Evolutionary Approach; Asymmetrical Groups.

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Finally, I would like to dedicate this research dissertation to my late grandfather. The wisest and smartest man I knew.

Declaration

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

I, Dylan Dennis declare that

1. The research reported in this thesis, except where otherwise indicated, is my original research.

2. This thesis has not been submitted for any degree or examination at any other university.

3. This thesis does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.

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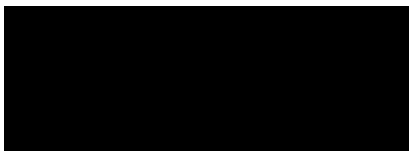

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Chapter 1: Introduction

Karl Marx famously declared that "the history of all hitherto existing society is the history of class struggles" (Marx & Engels, 1848, p. 14). This declaration, it would seem, still rings true today as modern societies are still plagued with large wealth disparities between socioeconomic groups (Connor, Stancato, Yildirim & Chen, 2020). The economic powerhouse of the world, namely the United States, exemplifies these modern wealth disparities. 614 billionaires, who have a combined wealth of $2.947 trillion, currently reside in the US all while a high percentage of U.S. households live pay-check to pay-check (Collins, Ocampo & Paslaski, 2020). The 400 richest Americans own as much wealth as America's bottom 64 percent, this is nearly two-thirds of the nation's households combined (Collins et al., 2020). Even though this warped economic relationship has been a huge interest for social science; we must continue to ask why is this unfair wealth distribution between the rich and the poor, currently raising its ugly head, to even greater heights (Connor et al., 2020)? Why would billionaires pay millions just so they can avoid billions in taxes (Collins et al., 2020)? If the super-rich pay their fair share of taxes they can contribute to the full funding of public institutions and infrastructure at the national, provincial, and local levels because a charity that is subsidised by the government can never adequately substitute a fair tax system (Collins et al., 2020). So why would billionaires selfishly leave far fewer resources available to support programs that could help ordinary people (Collins et al., 2020)?

Fortunately, the fascination with inequality has resulted in some authors clearing the murky waters of selfish social behaviour (Connor et al., 2020). This is because studies suggest that depending on the situation and the position of an individual's social group, it can result in an individual engaging in either self-interested behaviour – which is highly detrimental to other individuals but highly beneficial to oneself; or group-interested behaviour – which is highly detrimental to other groups but will privilege their own group (Connor et al., 2020; Tyler & Blader, 2003). One such way that this self-interest and group-interest social behaviour can be observed is with exchange systems because this allocation behaviour has been known to not only create inequality but unfortunately maintain dreadfully unfair societies (Cook, Cheshire, Rice & Nakagawa; 2013). Therefore, this research dissertation is not concerned with whether billionaires should exist or not but rather under what conditions will individuals either act self-interested or group-interested.

Chapter 2: Literature Review

The aim of this literature review is to explore the conditions which result in individuals being self-interested or group-interested in an economic social dilemma. This literature review will therefore outline social dilemmas. Additionally, this research dissertation will draw on Social Identity Theory (SIT) because it defines the factors that create social groups and the impact these social groups have on our behaviour (Tajfel, 1974; Turner, Hogg, Oakes, Reicher & Wetherell, 1987). Social groups are important for this research dissertation because "although we could not perceive our own in-groups excepting as they contrast to out-groups, still the in-groups are psychologically primary. We live in them, by them, and, sometimes, for them" (Allport, 1979, p. 42).

Social dilemma: Self-interest vs Group-interest

Some scholars posit that every person in a society is inevitably presented with an either/or choice between maximising their group's gains via a process of cooperation or, alternatively, defecting out of self-interest (Hauser, Hilbe, Chatterjee & Nowak, 2019). It is contended that this is the central social dilemma which all members within a group, at all levels of human society, must eventually face (Hauser et al., 2019; Gupta & Ogden, 2009; Messick & Brewer, 1983). Importantly, this social dilemma permeates all types of group systems and it not simply confined to a singular group condition making it fundamental to our understanding of how individuals behave when in a collective (for example it has been observed in family system, larger corporations and entire nations) (Frank, Obradovich, Sun, Woon, LeVeck & Rahwan, 2018; Rand & Nowak, 2013).

At first, this may seem like a simple situation because to maximise overall welfare, people just need to cooperate, but why do some individual's defect? (Hauser et al., 2019; Kerr, Godfrey-Smith & Feldman, 2004). A possible reason could be because the socially defecting choice results in the individual receiving a higher payoff than that of the socially cooperative choice (Gupta & Ogden, 2009; Dawes, 1980). However, on a broader scale, acting in this manner could be unsustainable and, counterintuitively, could result in a lower payoff for the individual (especially in the long-term) (Gupta & Ogden, 2009; Dawes, 1980). For example, a single individual defecting may have a relatively low impact, however, if individuals start to defect en masse it would cause the entire group system to slowly erode thus weakening the potential for the group system to work cooperatively (Gupta & Ogden, 2009; Messick & Brewer, 1983; Dawes, 1980). This erosion of the group system would force individuals to rely on their own singular labour to produce payoffs in lieu of a collective group system which could work

together cooperatively to maximise payoffs (Gupta & Ogden, 2009; Messick & Brewer, 1983; Dawes, 1980). Thus, if individuals were to cooperate, thereby creating a strong group system which could maximise their efforts for higher payoffs, then individuals (as a group) would be able to receive payoffs which were sustainable long-term by virtue of group cooperation (Gupta & Ogden, 2009; Messick & Brewer, 1983; Dawes, 1980). An individual defector may benefit in the short-term from their decision, however, their power to reproduce these gains endlessly is ultimately limited (Gupta & Ogden, 2009; Messick & Brewer, 1983; Dawes, 1980).

Prisoners' dilemma

In terms of an interpersonal level, this competitive self-interest or cooperative group-interest behaviour has been explored with the Prisoners' Dilemma (Peterson, 2015). The Prisoners' Dilemma is a situation where there are two people (Peterson, 2015). They are both part of a criminal organisation, who have been arrested for a serious crime (Peterson, 2015). There is no way for them to communicate with each other because they are both in solitary confinement (Peterson, 2015). The prosecutor gives them the opportunity to either confess or deny the charges (Peterson, 2015). The prosecutor explains that if both confess to the crime, they will both be sentenced to prison for ten years (Peterson, 2015). However, if one of them denies the crime but the other confesses to it, the one who confessed will be rewarded and will only have to serve one year in prison (Peterson, 2015). Although, the person who denied the crime will be sentenced to twenty years in prison (Peterson, 2015). If both of them deny the charges, each of them will have to serve two years in prison (Peterson, 2015).

The Prisoner's Dilemma can be used to analyse a broad range of social phenomena such as political power struggles, traffic jams, and global warming (Peterson, 2015). The Prisoner's Dilemma, therefore, is a situation that many of us encounter in everyday life (Peterson, 2015). However, for this research dissertation, the general lesson that can be taken from the Prisoners' Dilemma is if "I do what is best for me, and you do what is best for you, we end up in a situation that is worse for both of us" (Peterson, 2015, p. 2).

The Tragedy of the Commons

The above social dilemma in terms of a social level can be explained with a simple example proposed by Hardin (1968). Hardin (1968) tells us that we are to imagine a pasture which is common land, one that can be used by any individual who wishes to let their cattle graze (Hardin, 2009). Importantly, a limit to the herd size for the individual does not overtly exist and must instead be set by either the individual or the group making use of the pasture (Hardin,

2009). Once the pasture reaches its limit the field will be overgrazed, and the land will become unsustainable (Hardin, 2009).

This is where the dilemma exists as a rational self-interested individual who wishes to increase their own livelihood may simply add cows to their own herd for their own benefit (Hardin, 2009). However, this self-interested behaviour could be detrimental to the group as a whole as, inevitably, the pasture will become overgrazed at an inflated rate (Hardin, 2009). This individualistic behaviour, Hardin (1968) contends, in reality not only effects the individual but also negatively affect his fellow herdsmen as they are all dependent on a communal resource (Hardin, 2009). Hardin (1968, p. 1244) concluded this example with this grim statement: "[r]uin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all."

Free Rider Problem vs Cooperation for collective action

There are many contexts where collective action can benefit all members of a group (Hardin & Cullity, 2020). However, this requires the efforts of each and every member of the group (Hardin & Cullity, 2020). Unfortunately, there are situations where individuals do not contribute their fair share and free ride on the beneficial actions of others (Hardin & Cullity, 2020). A person's behaviour is considered free riding when the other group members think that said person is not contributing their fair share to the group's effort (Hall & Buzwell, 2013; Aggarwal & O'Brien, 2008). This free-riding behaviour is such a problem in society that there are even laws to prevent it (i.e., environmental consumerism) (Hardin & Cullity, 2020). In terms of social psychology, the free-rider problem raises two questions: "To what extent and in what circumstances are people motivated to free ride?" and "What sorts of negative incentives are effective in motivating cooperation when free-riding is possible?" (Hardin & Cullity, 2020, p. 1).

Collective action occurs in large-number contexts where people do not have relationships with each other (Hardin & Cullity, 2020). Extensive empirical evidence seems to suggest that there are at least three possibilities as to why individuals do not always free ride (Hardin & Cullity, 2020). Firstly, the incentives of group members can be influenced in such a way that it becomes their interest to contribute (Hardin & Cullity, 2020). Secondly, rather than self-interest, there may be other motivations at play (Hardin & Cullity, 2020). Thirdly, individuals may not

understand their own interests in a seemingly successful collective action (Hardin & Cullity, 2020).

Freeriding while others cooperate

The Prisoners' Dilemma and The Tragedy of the Commons raise the question; is there a way to avoid narrow self-interest in favour of a common good? (Battersby, 2017). This social dilemma is the logic behind many of our biggest problems (Battersby, 2017). Forests, fisheries and even the air we breathe are shared resources that are being threatened by self-interested individuals (Battersby, 2017). These self-interested individuals fully know that the resources will run out if everyone does the same as them (Battersby, 2017). Which ultimately will result in the demise of humankind. In today's world, our limited resources are under more and more strain by our population and technology (Battersby, 2017). However, it is beyond the scope of this research dissertation to find a solution. Instead, the research dissertation is interested in competition and cooperation with others, as this is an integral part of most interpersonal and intergroup encounters (Sagiv, Sverdlik & Schwarz, 2011). Therefore, this research dissertation is concerned with what incentives make people decide to either compete with other people at those people's expense or cooperate with them even if there is some cost for themselves (Hardin & Cullity, 2020; Sagiv et al., 2011).

Social Identity Theory

The theoretical framework that this research dissertation will align itself with, is Social Identity Theory (SIT) (Tajfel & Turner, 1979). This theory was deemed relevant as people readily categorise themselves and others into social groups (Reimer, 2018). This categorisation into groups is important because SIT proposes that individuals will take less in absolute material terms so that their group is relatively better off than another group (Durrheim, Quale, Tredoux, Titlestead & Tooke, 2016; Turner & Reynolds, 2011; Tajfel & Turner, 1986; Tajfel & Turner, 1979). This seems to suggest that individuals can be group-interested because they act against their selfish economic interests (Durrheim et al., 2016). This raises the question of why an individual will accept less monetary reward so that their ingroup is relatively better off than outgroup members (Durrheim et al., 2016)? This research dissertation will therefore use SIT to outline how simply being categorised as a member of a certain group can cause group-interested exchange behaviour (Hogg, 2016). This in contrast to other prominent theories such as Sherif's (1966) competitive goal relations which is a context-dependent approach (Durrheim et al., 2016; Hogg, 2016).

Kandinsky vs Klee

Before outlining how individuals categorise themselves as belonging to various groups and how this influences group-interested exchange behaviour, this research dissertation will first explain how Tajfel (1970), with the help of others, set out to investigate the influence of categorisation (Tajfel, Billig, Bundy, & Flament, 1971). They did this by designing the Minimal Group Paradigm (MGP) (Tajfel et al., 1971). Their MGP randomly assigned participants to one of two groups (Tajfel et al., 1971). However, the participants were led to believe that this assignment was due to their preference of either a Kandinsky or Klee painting (Tajfel et al., 1971). This experiment ensured that the participants only knew which group they were members of because the identity of the other ingroup and outgroup members was not revealed to the participants (Tajfel et al., 1971). The experiment required that participants individually allocate money between the pairs of anonymous recipients (Tajfel et al., 1971). Although this was only a pencil-and-paper task it was designed in such a way that the allocation strategies of the participants became apparent (Tajfel et al., 1971). This was done by repeating the task over a number of times with a number of different ingroup and outgroup member pairings and additionally by not allowing the participants to allocate money to themselves (Tajfel et al., 1971).

Us vs Them

The results of the experiment suggested that categorised participants, strongly favoured their ingroup compared to participants that were uncategorised, even though there was a context of fairness (Durrheim et al., 2016; Tajfel et al., 1971). These finding were surprising because the groups were based on a weak criterion as the participants had no past history or possible future with each other, the identity of the participants were concealed and since the participants could not allocate money to themselves, there was no self-interest involved (Hogg, 2016). Subsequent experiments that were even more minimal in nature (i.e., participants were simply told that they were either in X group or Y group and given no other reason) produced the same results (Billig & Tajfel, 1973).

Social Categorisation and Comparison

In the real-world, people are continuously and spontaneously dividing themselves and others into ascribed categories (e.g., ethnicity or gender), economic categories (e.g., high or low economic status), achieved states (e.g., occupation or political affiliation), and other relevant distinctions (Reimer, 2018; Trepte & Loy, 2017; Deaux, 1996). This dividing can also be on more general terms such as perceptions of similarity, proximity, and common fate (Campbell,

1958). This sense of 'us' and 'them' may be because we depend on groups to survive and this has developed our fundamental need to belong to social groups (Brewer, 2007; Baumeister & Leary, 1995). Additionally, people usually lack a sense of who they are and how to evaluate their group membership (Trepte & Loy, 2017; Hogg, 2000; Festinger, 1954). Therefore, comparing themselves with ingroup and outgroup members allows them to define themselves because they can attach value and meaning to their group membership (Reimer, 2018; Hogg, 2000).

Social Identity and Self-esteem

The knowledge that a person belongs to a group coupled with some emotional and value significance to their group membership therefore results in a social identity (Tajfel & Turner, 1986; Tajfel, 1972). However, a person sense of self can be either positive or negative, but people strive to gain a positive social identity because they want a heighten self-worth and self-esteem (McLeod, 2019; Trepte & Loy, 2017; Tajfel & Turner; 1979). Therefore, a person's self-concept comprises of how social categorisation and their particular groups ascribed values are represented (Trepte & Loy, 2017).

Positive distinctiveness

People are therefore always comparing their group, whether large or small, with another relevant, proximate and similar outgroup (Trepte & Loy, 2017; Hogg, 2016; Hogg, 2000; Hinkle & Brown, 1990). Although when a person compares the groups, they make sure that their group is clearly different and more favourable than the other group (Hogg, 2016). This battle over relative status and prestige results in a positive evaluation of the ingroup (i.e., ingroup favouritism) but a negative evaluation of the outgroup (i.e., outgroup derogation) (Trepte & Loy, 2017; Hogg, 2016). This comparison thus results in status differentials because social status is closely linked to social identity as people strive for a high social status (Hogg, 2000; Tajfel & Turner; 1979). Additionally, behaviour is influenced because the shared group identity determines and assesses a person's perceptions of self, belief and behaviours (Hogg, 2016; Hogg, 2000).

Self-Categorisation

People do however socially interact with people who belong to different categories (Trepte & Loy, 2017). The interactions with people from other groups gives people experiences and these experiences make us constantly refine our own social group membership (Trepte & Loy, 2017). However, this self-categorisation needs to be relevant, so the person can identify with the social category and therefore internalise their self-concept (Tajfel & Turner, 1979). However, this

process is an active, interpretative and judgemental process which reflects a complex and creative interaction between motives, expectations, knowledge and reality (Turner, 1999). Individuality is the outcome and shows that categories are not permanent and cannot foster an everlasting self-image (Trepte & Loy, 2017). Therefore, personal and social identities can vary but also stay the same, but it depends on the situation and its meaning (Trepte & Loy, 2017).

Individual vs Group

When do people think of others in terms of their social categories? SIT suggests that depending on the situation, it can vary along an interpersonal-intergroup continuum (Tajfel, 1981). When a social encounter is on the interpersonal end of the interpersonal-intergroup continuum, the personal relationships between the individuals, as well as their characteristics, will determine the social encounter (Tajfel, 1981). When there is a social encounter at the opposite extreme end of the continuum (i.e., intergroup extreme), the social group or category that the individual is a member of will determine all the behaviour from two or more individuals towards each other (Tajfel, 1981). This is because people increasingly think of others in terms of their membership within a social group or category when the situation shifts towards the intergroup end of the continuum (Tajfel, 1969). Therefore, the group membership of an individual determines how that person is treated (Tajfel, 1969). However, this results in depersonalised individuals. (Turner et al., 1987; Tajfel & Turner, 1979). This is because when individuals are matched and assigned to a group, they view themselves in terms of their groups' membership attributes rather than viewing themself as idiosyncratic individuals (Turner et al., 1987). This results in ingroup members similarities being emphasised, while highlighting the differences of outgroup members (i.e., accentuation principle) (Hogg & Abrams, 1988). This in turn promotes conformity to the ingroup behavioural norms (Turner et al., 1987). This social categorisation process seems to help people navigate the social world that is marked by hierarchies and group distinctions because it determines and assesses an individual's perceptions of self, beliefs and behaviours (Reimer, 2018; Turner et al., 1987).

Interpersonal vs Intergroup

What determines whether an interaction is interpersonal or intergroup? This depends on how psychologically present group membership is during contact (i.e., group salience) (Brown & Hewstone, 2005). Group salience depends on relative accessibility and fit in a given situation (Oakes, 1987). The social categorisation will fit a situation if there is a structural and normative fit (i.e., similarities and differences between individuals relate to a relevant category and these similarities and differences correspond to the content of relevant category) (Reimer, 2018). A

social category can also be situationally accessible because the social categorisation can be made clearly relevant due to situational features (e.g., time and place) (Reimer, 2018). Therefore, a given situation needs to be both accessible and fit, for the ingroup-outgroup distinction to be salient (Reimer, 2018). This suggests that group salience is both situational and personal (Reimer, 2018). The use of specific social categories differs for different people, as for some people the social categorisation is frequently accessible because it is on the forefront of their mind (Reimer, 2018). For these people, more situations will have group salience (Oakes, 1987).

Individual Strategies vs Group Strategies

Depending on the situation and the nature of the relationship between the ingroup and outgroup, people will either use individual strategies or group/collective strategies to improve or maintain their current situation (Hogg, 2016; Ellemers, 1993). However, to determine which strategy is chosen, individuals focus on the subjective belief structures of:

1. Status which is concerned with the social standing their ingroup has with the relevant outgroup (Hogg, 2016; Ellemers, 1993).
2. Stability which is concerned with how stable the status relationship with the ingroup, and relevant outgroup is (Hogg, 2016; Ellemers, 1993).
3. Legitimacy which is concerned with whether this status relationship is legitimate (Hogg, 2016; Ellemers, 1993).
4. Permeability which is concerned with the ease of changing of social identity, therefore can a member of the ingroup pass into the relevant outgroup (Hogg, 2016; Ellemers, 1993).
5. Cognitive alternatives which are concerned with whether a different intergroup relationship is possible (Hogg, 2016; Ellemers, 1993).

However, improving one's status at individual level may prevent one's group from achieving a higher status and vice versa, it is therefore important to know what influences people to adopt individual strategies or group strategies in a social structure (Ellemers, 1993).

High Status

People fundamentally strive to adopt and implement strategies which enhance their self-esteem (Trepte & Loy, 2017; Hogg, 2016; Tajfel & Turner; 1979). One way to achieve this in a given society is by aligning oneself with a group which has positive societal connotations (Trepte & Loy, 2017; Hogg, 2016; Tajfel & Turner; 1979). In societies which value wealth (monetary or otherwise) prosperous individuals belong to a '*Rich Group*' which receive favourable

evaluations precisely because they own a surplus of a valued resource (Trepte & Loy, 2017; Hogg, 2016; Tajfel & Turner; 1979). These favourable evaluations ultimately correlate with an increase in self-esteem if one was to belong to such a group in turn making this type of group highly prized (Trepte & Loy, 2017; Hogg, 2016; Tajfel & Turner; 1979). These positive evaluations also mitigate the need for social comparison as having access to a highly prized group by default means that one is also a highly prized individual (once again increasing self-esteem) (Trepte & Loy, 2017; Hogg, 2016; Tajfel & Turner; 1979). Conversely, this implies that the opposite is true for members who belong to a '*Poor Group*' (this will be expanded on later) (Trepte & Loy, 2017; Hogg, 2016; Tajfel & Turner; 1979).

Intriguingly, *High Status* members do respond with compensatory helping to *Low Status* members, when responding to unfairness (Durrheim et al., 2016; Rubin, Badea & Jetten, 2014; Bettencourt et al., 2001). This is because people with more resources face the social dilemma of social responsibility (Ding, Wu, Ji, Chen, & Van Lange, 2017). This is largely an outcome of cultural forces which encourage ingroup cooperation but also intergroup fairness in a system of exchange behaviour (Durrheim et al., 2016). In practice this means that *High Status* people will therefore share resources with less fortunate people so their welfare may be promoted (Ding et al., 2017). However, a counter argument to this noblesse oblige is that *High Status* members believe that their economic advantage is well-deserved therefore validating their enhanced resources (Ding et al., 2017; Jost, Banaji, & Nosek, 2004; Lerner, 1980). *Rich Group* members therefore can view social change as a threat to their own status position (Hutter, 1970). To defend their *High Status* position and have asymmetric control over economic resource, *Rich Group* members will promote the idea that a limited amount of *Poor Group* members can pass into the *Rich Group* with intergroup compensatory helping (Ding et al., 2017; Hogg, 2016; Magee & Galinsky, 2008; Jackson, Sullivan, Harnish, & Hodge, 1996; Ellemers, 1993; Hutter, 1970). This intergroup compensatory helping is therefore a way to coax *Poor Group* members to defect, so their group strategies are undermined and prevented (Hogg, 2016; Ellemers, Van Knippenberg, De Vries, & Wilke, 1988).

Low Status

A *Low Status* via social comparison indicates that the *Rich Group* is better and therefore *Poor Group* members self-esteem is threatened because a negative social identity is attached to their group membership (Trepte & Loy, 2017; Ellemers, 1993; Hogg & Abrams, 1988). This diminished self-esteem and negative social identify makes *Poor Group* members want to improve their current situation and therefore various motivational strategies will be triggered

(Trepte & Loy, 2017; Ellemers, 1993). One such motivational strategy is that *Poor Group* members will collectively attempt to alter a *Low Status* into a *High Status* by directly competing over status with the *Rich Group* members so they can find relief from their hurt social identity and low self-esteem (Trepte & Loy, 2017; Hogg, 2016; Bettencourt et al., 2001; Ellemers, 1993; Hogg & Abrams, 1988). This is because they realise that individual strategies will not overcome the inequality and therefore to renegotiate the status quo there is a need for group strategies (Ellemers, Spears & Doosje, 1997).

Individual Mobility

Individual Mobility (social mobility) results in both group's subjective belief structure centring around permeability (Hogg, 2016). Individuals will therefore believe that the intergroup boundaries are soft and easy to cross (Hogg, 2016). *Poor Group* members will try leave and disidentify with the *Poor Group* while trying to gain acceptance into the *Rich Group* (Trepte & Loy, 2017; Hogg, 2016). This results in diminished group strategies because in this type of situation the *Poor Group* members believe the status quo can never change but they desire to improve their personal situation (Hogg, 2016; Jackson et al., 1996; Ellemers, 1993; Hutter, 1970). *Poor Group* members will therefore try to enhance their own social identity by rather opting for individual strategies (Jackson et al., 1996). However, intergroup boundaries are rarely permeable therefore it is highly unlikely that the *Poor Group* member will pass into the *Rich Group* (Trepte & Loy, 2017; Hogg, 2016).

The *Rich Group* members will promote the idea of social mobility to defend their *High Status* and preserve their position in the unequal hierarchical structure (Nadler & Halabi, 2006; Doosje et. al., 2002; Ellemers, 1993; Hechter, 1988). The *Rich Group* members will try coax *Poor Group* members to defect from group strategies because any form of social change is a threat to their *High Status* position (Hogg, 2016; Ellemers, 1993; Hutter, 1970). The *Rich Group* members will use intergroup compensatory helping because it promotes the idea of social mobility (i.e., the America dream) (Hogg, 2016; Jackson et al., 1996). (Hogg, 2016; Jackson et al., 1996). Since this gives *Poor Group* members the idea that a limited amount of *Poor Group* members can have a *High Status* (Hogg, 2016; Jackson et al., 1996; Hutter, 1970).

Additionally, those people taking part in individual strategies and attempting to leave their group will be excluded not only from their group but also the other group (Hogg, 2016). These individuals excluded from both groups will experience social identity limbo which further decreases group strategies because these individuals perceive their own individual needs as

being more important than their group's needs (Hogg, 2016; Jackson et al., 1996; Ellemers, et al., 1993). Therefore, the social encounter will be on the interpersonal end of the interpersonal-intergroup continuum and therefore the personal relationships between the individuals, as well as their characteristics, will determine exchange behaviour (Tajfel, 1981).

Group Mobility

For *Group Mobility* (social change) to occur there needs to be impermeable boundaries and unstable status relations between the *High Status* group and *Low Status* group (Durrheim et al., 2016; Tajfel et al., 1971). The subjective belief structure of low permeability makes individuals believe that the intergroup boundaries are hard and difficult to cross (Hogg, 2016). Therefore, making all social encounters at the intergroup extreme of the continuum (Tajfel, 1981). Group membership will therefore determine all behaviour because both group members will think of each other in terms of group membership (Tajfel, 1969). Therefore, individual perceive their groups needs as being more important than their own individual needs thus membership of an individual determines that they should take part in group strategies (Tajfel, 1969).

This perception of social change makes *Poor Group* members recognises that it is an illegitimate social order (Hogg, 2016). This results in cognitive alternative which provides *Poor Group* members with a critical ideology and a blueprint for how social change can be achieved (Hogg, 2016). The *Poor Group* members will therefore not accept the social stigma attached to them and the *High Status* of the *Rich Group* (Hogg, 2016; Bettencourt, Charlton, Dorr, Hume, 2001). This makes *Rich Group* members feel insecure about their social status thus making the illegitimate hierarchical structure perceived to be unstable (Hogg, 2016; Bettencourt, et al., 2001). If a hierarchical structure is unstable, it makes group members take part in group strategies to promote their ingroups' positivity (Trepte & Loy, 2017; Hogg, 2016 Bettencourt, et al., 2001). Since group strategies are perceived to be the best way to change the unstable and illegitimate hierarchical structure (Hogg, 2016 Bettencourt, et al., 2001). *Rich Group* members will use group strategies to protect their elevated superiority and attempt to preserve their position in the status quo (Hogg, 2016; Nadler & Halabi, 2006; Ellemers, 1993). The group strategies by *Rich Group* member are therefore an attempt to secure their *High Status* in the unequal hierarchical structure (Doosje, Spears, & Ellemers, 2002; Ellemers, 1993; Hechter, 1988).

Chapter 3: Aims, Hypotheses and Rationale

Aims

The aims of this study are to:

1. Examine the effect of *Status* on self-interested exchange behaviour vs group-interested exchange behaviour.
2. Examine the effect of *Individual Mobility* on self-interested exchange behaviour vs group-interested exchange behaviour.
3. Examine the effect of *Group Mobility* on self-interested exchange behaviour vs group-interested exchange behaviour.

Research Questions, Hypotheses and Expectations

Status Hypothesis

Research Question:

Investigate what influence *Status* has on self-interested exchange behaviour vs group-interested exchange behaviour?

Hypotheses:

H0: There is no significant difference in exchange behaviour among *High Status* participants compared to *Low Status* participants.

H1: *High Status* participants take part in significantly higher levels of self-interested exchange behaviour than *Low Status* participants.

Expectations:

Based on the literature review it is expected that *High Status* will result in significantly higher levels of self-interested exchange behaviour whereas a *Low Status* will result in significantly higher levels of group-interested exchange behaviour.

Individual Mobility Hypothesis

Research Question:

Investigate what influence *Individual Mobility* have on self-interested exchange behaviour vs group-interested exchange behaviour?

Hypotheses:

H0: There is no significant difference in exchange behaviour among participants under the *Individual Mobility* condition.

H1: *Individual Mobility* result in significantly higher levels of self-interested exchange behaviour for participants than *No Mobility*.

Expectations:

Based on the literature review it is expected that the *Individual Mobility* condition will result in significantly higher levels of self-interested exchange behaviour for both *High Status* and *Low Status* participants compared to the *No Mobility* condition.

Group Mobility Hypothesis

Research Question:

Investigate what influence *Group Mobility* have on self-interested exchange behaviour vs group-interested exchange behaviour?

Hypotheses:

H0: There is no significant difference in exchange behaviour among participants under the *Group Mobility* condition.

H1: *Group Mobility* result in significantly higher levels of group-interested exchange behaviour for participants than *No Mobility*.

Expectations:

Based on the literature review it is expected that the *Group Mobility* condition will result in significantly higher levels of group-interested exchange behaviour for both *High Status* and *Low Status* participants compared to the *No Mobility* condition.

Rationale

Status

High Status will result in participants taking part in intergroup compensatory helping as this self-interest exchange behaviour is a way to coax *Low Status* participants to defect, so their group strategies are undermined and prevented thus preserving their *High Status.*

Low Status will result in participants taking part in collective action as this group-interested exchange behaviour is a way to alter a *Low Status* into a *High Status* thus finding relief from their hurt social identity and low self-esteem.

Individual Mobility

The *Individual Mobility* condition will result in participants taking part in self-interested exchange behaviour because participants will perceive their own individual needs as being more important than their group's needs thus social encounters will be on the interpersonal end of the interpersonal-intergroup continuum and therefore the personal relationships between the individuals, as well as their characteristics, will determine exchange behaviour.

Group Mobility

The *Group Mobility* condition will result in participants taking part in group-interested exchange behaviour because participant will perceive their groups needs as being more important than their own individual needs thus all social encounters will be at the intergroup extreme of the continuum. Therefore, group membership will determine all behaviour because both group members will think of each other in terms of group membership.

Chapter 4: Methodology

Within this chapter the procedures used to achieve the aims, research question and hypotheses are described. Therefore, a detailed description of the *Virtual Interaction Application (VIAPPL)*, the *Research Design* and *Data Collection Techniques* will be outlined. This will be followed by the *Methods of Analysis* and then *Validity, Reliability and Rigour*. The chapter will conclude with the *Ethical Considerations* that were considered when the study was being developed and conducted.

Virtual Interaction Application (VIAPPL)

VIAPPL is an experimental software platform that gives experimenters the advantage of exploring exchange behaviour, as VIAPPL experiments can be conducted to test an expansive range of psychological and social hypothesis. This is because VIAPPL allows the experimenter to manipulate experimental conditions and then analyse the individuals' exchange behaviour data. VIAPPL therefore facilitates the documentation of either self-interested exchange behaviour or group-interested exchange behaviour in a MGP. VIAPPL can thus consequently observe the evolution of the social structures, exchange behaviour patterns and social outcomes of these manipulations. (VIAPPL, see viappl.org)

The unique interface in this study therefore allowed participants to perform autonomous experimental dollar allocations. This exchange behaviour data was collected by their executed allocation of experimental dollars. Additionally, a social environment was created where certain characteristics of the game were manipulated. Therefore, to suit the intentions of the experimenter and asses how either self-interested exchange behaviour or group-interested exchange behaviour emerge, the game adopted a design that had a *Rich Group* (*High Status*) and a *Poor Group* (*Low Status*). Additionally, there was the perceptions of Social Mobility and Social Change. This experiment therefore intended to show how different individuals' exchange behaviour is either self-interested or group-interested in different situations.

Research Design

This quantitative study employed a factorial design. Since the study had more than one independent variable. In this study there were three Independent Variables (factors) used in the analyses:

1. Individual Mobility
2. Group Mobility
3. Status

The study therefore used a factorial analysis of variance (ANOVA) as the research design had three Independent Variables, where every level of each variable is paired with every level of all the other variables. This fully crossed 2 x 2 factorial design with a *High Status* (*Rich Group*) and *Low Status* (*Poor Group*) group in each experimental condition, was used to test the differences between the 8 cell means and the marginal (level) means. The fully crossed four experimental conditions were as follows:

1. No Individual Mobility and No Group Mobility (No Mobility)
2. Only Individual Mobility and No Group Mobility (Individual Mobility)
3. No Individual Mobility and Only Group Mobility (Group Mobility)
4. Both Individual Mobility and Group Mobility (Individual + Group Mobility)

This allowed for a detailed analysis of the data as the main effects and possible interactions of the Independent Variables could be investigated. Therefore, producing findings that are realistic as the research design captures the complexity of social and psychological phenomena of experimental dollar exchange behaviour. Additionally, this factorial design was economical as it allowed for the simultaneous testing of many hypotheses. As the Independent Variables included in the study were theoretically and empirically related to the Dependent Variables. The three Dependent Variable used in the three analyses were:

1. Ingroup Bank Giving Amount
2. Outgroup Bank Giving Amount
3. Outgroup Individual Giving Amount

Experimental Manipulations Conditions

In this study a total of 60 experiments (games) were conducted over 10 rounds across four experimental conditions. By manipulation the presence or absence of three experimental factors the experimenter could create the four experimental conditions. There were 15 games of each experimental condition. Experimental conditions were predetermined by a randomized list before any experiment was conducted. In each experimental game, there was a group of 8 participants which resulted in the entire sample being 479 participants (initial sample was 480 however one participant failed to complete the game).

No Mobility

This was a control condition because there was no perception of Social Mobility and Social Change because the experimenter did not inform the participants about any of the experimental conditions. The experimenter merely informed the participants of the '*Rules of Exchange*'

(explained under *Data Collection Techniques*). Therefore, individuals had the perception of no *Individual Mobility* and no *Group Mobility*.

Individual Mobility (IM)

This experimental condition gave the perception of Social Mobility because the experimenter informed the participants that at the end of the game, an individual in the *Poor Group* that acquired the highest amount of experimental dollars (compared to the other *Poor Group* individuals) would swap places with an individual in the *Rich Group* that had the lowest amount of experimental dollars (compared to the other *Rich Group* individuals).

- I.e., the richest *Poor Group* individual that swapped places with the poorest *Rich Group* individual, would have the benefit of getting a share of the *Rich Group Bank* which started the game with 200 experimental dollars, and was shared amongst only 3 individuals. The poorest *Rich Group* individual that swapped places with the richest *Poor Group* individual, would have the disadvantage of getter a share of the *Poor Group Bank* that started the game with 0 experimental dollars and was shared amongst 5 individuals.

Between each round, the experimenter reminded the participants of this inevitable swap. However, participants were not given any more information. This swap in individuals never took place in any of the games. The rationale behind letting participants know of this swap in members was to create a perception of Social Mobility (Refer to Appendix A to view the standard script that was used when conducting the experiment for quotes of what was said to participants and when these instructions were repeated to participants)

Group Mobility (GM)

This experimental condition gave the perception of Social Change because the experimenter informed the participants of a change in group fortune if the *Poor Group Bank* increases in wealth at a rate faster than *Poor Group Bank* in previous games and faster than the *Rich Group Bank* in this particular game.

- I.e., The *Poor Group* would acquire the full amount of experimental dollars (200) that the *Rich Group Bank* started with.

However, the *Poor Group* would only receive these 200 experimental dollars at the end of the game. The *Poor Group* would subsequently become the *Rich Group* as there would be an

economic revolution. The experimenter reminded the participants of this possible economic revolution between each round. However, participants were not given any more information.

This economic revolution never took place in any of the games. The rationale behind letting participants know that if the *Poor Group Bank* increased at a rate faster than *Poor Group Bank* in previous games was to maintain ambiguity. This ambiguity was an attempt to avoid entirely priming the participants. Additionally, the participants would perceive the group hierarchy as being potentially unstable. Participants would have a perception that the social system is dynamic and unstable, as groups can move up and down in the social hierarchy. Therefore, the experimental condition of *Group Mobility (GM)* instilled the possibility Social Change. (Refer to Appendix A)

Individual Mobility and Group Mobility (Individual + Group Mobility)

This was a control condition because there was a perception of Social Mobility and Social Change because the experimenter informed and then communicated between rounds that the *Individual Mobility (IM)* experimental condition would apply as well as the *Group Mobility (GM)* experimental condition.

Sample and Sampling Technique

Sample

In multilevel studies to calculate power the experimenter needs approximate knowledge of the effect size, intraclass correlation coefficients and also other parameters (Snijders & Bosker, 2012). However due to the novelty of this study, the experimenter did not know which parameter values to expect and thus had no reliable grounds to calculate the sample size Titlestad, Snijders, Durrheim, Quayle & Postmes, 2019). Therefore, the experimenter decided to use a relatively high sample size and 15 games per experimental condition (Titlestad, 2019).

This study sampled 479 (N = 479; 153 Female; 323 Male; 3 Undeclared Gender; Mage = 22.11) University of KwaZulu-Natal students (UKZN) from the Pietermaritzburg campus (initial sample was 480 however one participant failed to complete the game). There were no inclusion/exclusion criteria, however, the gatekeeper's permission only covered registered UKZN students. Therefore, participants had to be registered UKZN students. All participants were therefore above the age of 18 so written informed consent was obtained by all participants. UKZN has an inclusive population demographic across age, gender, race, however the factor of demographics was not of interest in this study because the study was interested in a

fundamental human behaviour. Therefore, demographics were not included in the sampling criteria.

An individual was only allowed to participant once in the *Get Rich Game* which was ensured by a finger scanner. Additionally, this protected the validity of the results. If an individual had participated in one of the pervious VIAPPL studies run at the UKZN, they could still participate in the *Get Rich Game*. Since the experimental conditions in the *Get Rich Game* were different from any previous VIAPPL study conducted. The participants were compensated 40 South African Rands. Participants were paid a flat rate of R40 regardless of their balance of experimental dollars at the end of the game. As this cash incentive was for participating in the study and therefore for their time and effort and not solely for the recruitment of individuals.

Table 1: Demographics

	Total Participants	479	
Age	Minimum	18	
	Maximum	40	
	Average	22,11	
Gender	Male	323	67,43%
	Female	153	31,94%
	Other	3	0,63%
Race	Black	451	94,15%
	Indian	10	2,09%
	Coloured	9	1,88%
	White	6	1,25%
	Other	4	0,84%

Sampling Technique

A large number of participants over a short period of time was required. Therefore, a convenience non-probability sampling technique was used. As this sampling method was the most feasible because it allowed the experimenter to get participants in a relatively timeously and inexpensive manner (Salkind, 2012). Convenience sampling techniques have the possibility of compromising external validity, however it is a common sampling technique used in experimental studies (Gillespie, 2016). However, as seen the in 'Validity, Reliability and

Rigour' section below, this study enhanced the internal validity to account for the compromised external validity

Recruitment Procedure

This study employed word of mouth and both visual advertising and face-to-face (personal) recruitment methods. Due to UKZN's large student population, a "first-come-first-serve" assessment was used to determine which 8 potential participants would be selected. Since there were times were there were more than 8 individuals waiting outside the PsychLab (Psychology Computer Laboratory). Remaining potential participants were asked to wait roughly 45 – 60 minutes or alternatively, leave their contact details so a time convenient to them could be arranged.

The visual advertising had contact details so a group of 8 participants could be arranged with potential participants that contacted the experimenter (see Appendix B for Advertisement Poster). With the face-to-face (personal) recruitment method, the experimenter approached potential participants on the UKZN Pietermaritzburg campus. The experimenter would briefly explain the purpose of the study – a computer game that involves exchanging experimental dollars – and if the potential participant expressed their interest, they were given directions to the PsychLab.

Data Collection Techniques

Experimental Procedure

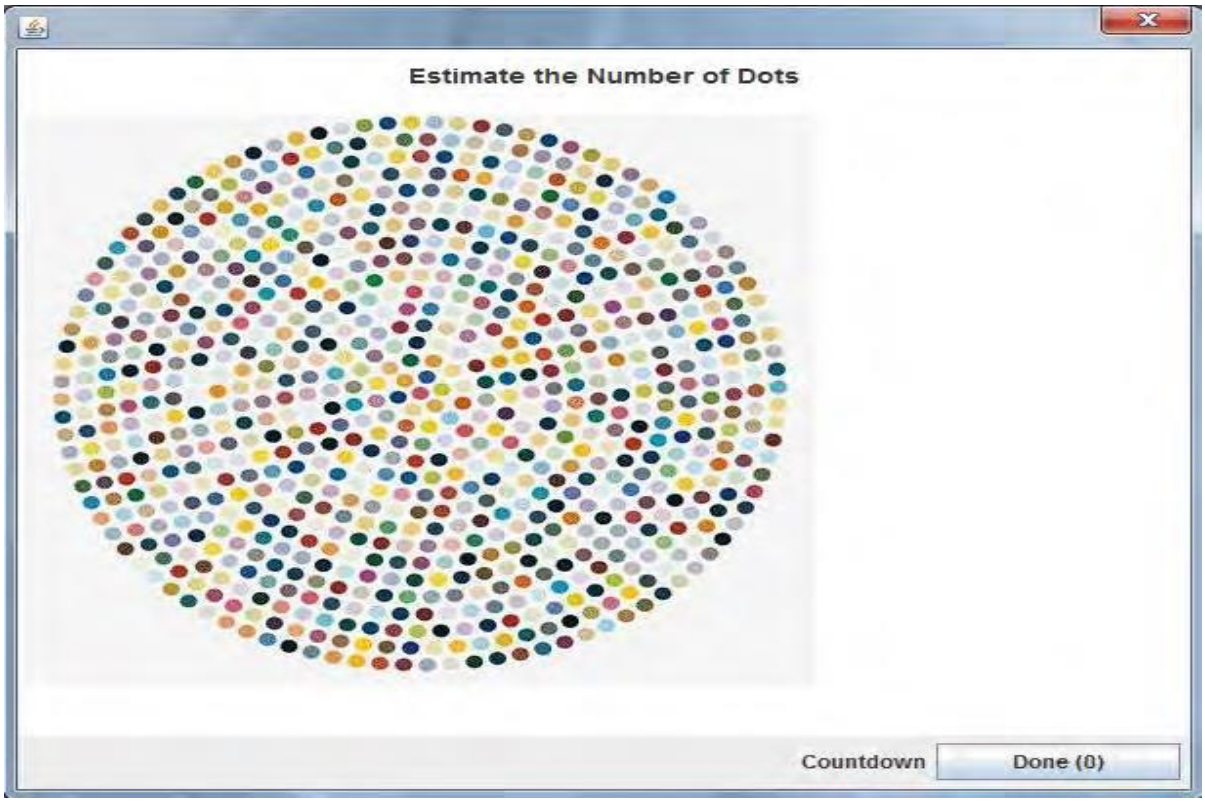
Participants were led into the UKZN PsychLab and physically placed at a computer. Although all participants were in the same room, there was a single computer space between all 8 participants. Additionally, the PsychLab is set up in such a way that each computer has a divider on either side and participants faced away from each other when looking at their computer screen.

An information sheet and consent form (refer to Appendix C) – which was placed in front of the computer before the participants entered the room – was then explained to them. This allowed the participants the chance to leave if they wished to do so or allowed them to ask any questions. When all participants had been given enough time to read and fully understand the informed consent, each participant was asked to sign it.

The experimenter then gave a short introduction to the rules of the game (see Appendix A) and informed the participants that the game would take roughly 45 minutes to an hour. The

participants were then asked to click the "Start" button on their computer screen and then were immediately prompted with the "Dot Estimation Task" (see Figure 1).

Figure 1: Dot Estimation Task



Group Allocation

The "Dot Estimation Task" is a complex image with hundreds of multi-coloured dots in a circular cluster. The participants then estimate how many dots they think there is on the image but only have 10 seconds to do so. Participants then type their estimate and click on the "done" button. This places participants in either the *Poor Group* or *Rich Group*. The experimenter merely informed the participants that this allocation was due to their estimates. Although this was not the case, as it is impossible to count the dots in 10 seconds but rather, they were placed into one of two groups randomly by VIAPPLs algorithm.

The group allocation was an important aspect in this study, as MGP studies have commonly used "Dot Estimation Tasks" to naturalise individuals' perceptions of the arbitrary group identification/allocation (Tajfel et al., 1971). The status assignment into either the *Poor Group* or *Rich Group* resulted in participants to have the perception of group identification. Additionally, there was a strengthen 'otherness' between the two groups. This intrinsic difference between the individuals thereby eliminated any real world social or group categories

that could influence an individual's behaviour. The study could therefore investigate the social phenomena in question under a controlled environment with minimal conditions.

Demographics, Practice Rounds and Pre-test Questionnaire

Once allocated to a group, participants filled out an online 3-item demographics questionnaire on a LimeSurvey interface – which was integrated into the VIAPPL software (see Appendix D). Then they were given the opportunity to have two practices rounds of the *Get Rich Game*. Allowing participants, the chance to understand and become familiar with the VIAPPL interface. Additionally, it allowed the experimenter the opportunity to run an interactive tutorial of the *Get Rich Game*. As the experimenter explained the objectives, rules of exchange and the game conditions. Therefore, the two practice rounds were a practical learning experience and also a manipulation check – as the experimenter could check that each participant understood how the *Get Rich Game* worked. The pre-test questionnaire was then administered and assessed the psycho-social aspects of Group Identification, Legitimacy and Social Dominance (see Appendix D). However, this data was not used in the analyse but rather was a manipulation check (see Appendix E)

The Get Rich Game

The *Get Rich Game* VIAPPL interface had an information panel and arena:

i. The Get Rich Game Information Panel

- "Progress" which showed the trial and round.
- "Your Tokens" which showed the participants' "Balance" of experimental dollars and "Available" experimental dollars the participant had left to exchange in the round.
- "Group Tokens" which showed two amounts:
    - Combined experimental dollars of all the *Poor Group* members and *Poor Group Bank*.
    - Combined experimental dollars of the all the *Rich Group* members and *Rich Group Bank*.
- "Bank Token" showed the amount in the *Poor Bank* and the amount in the *Rich Bank*.
- "Options" had three tabs:
    - "Clear Moves" which would clear the exchanges if the participants changed their mind.
    - "Submit" which the participant would have to click once they were happy with their exchanges. All participants have to click it to move onto the next round.

- "New Messages" would open up a new window with all the messages sent.

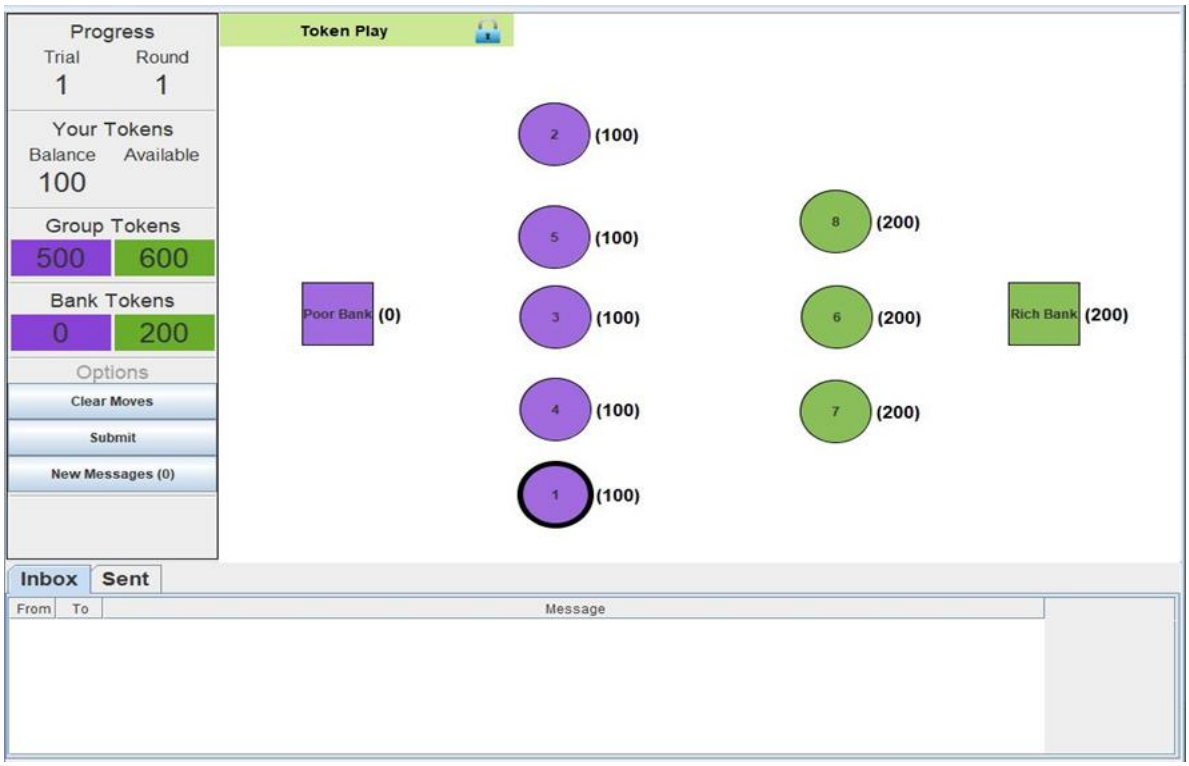
ii. The Get Rich Game arena

The *Get Rich Game,* a game-like VIAPPL environment, was designed, programmed and developed with the help of Prof Kevin Durrheim, Dr Michael Quayle and Dr Larry Tooke. The *Get Rich Game* had manipulated study specific variables such as:

1. The *Get Rich Game* was completed over two trials:
    - The first trial being the two practice rounds, and
    - The second trial was the experimental trial, which consisted of 10 exchange rounds. The participants were not made aware of the number of rounds.
2. Eight participants; randomly allocated to two unequal groups:
    - Five participants were allocated to the *Poor Group* (*Low Status*) – represented as 5 individual purple circle avatars on the left side of the VIAPPL interface.
    - Three participants allocated to the *Rich Group* (*High Status*) – represented as 3 individual green circle avatars on the right side of the VIAPPL interface.
3. Two unequal commons:
    - The *Poor Group Bank* (*Low Status Commons*) was represented as a purple square avatar with the text "Poor Bank" on the left side of the VIAPPL interface.
    - The *Rich Group Bank* (*High Status Commons*) was represented as a green square avatar with the text "Rich Bank" on the right side of the VIAPPL interface.
4. A thick black ring around a circle avatar depicted a participant. Avatars that had thinner rings around them were the other participants. This prevented any potential confusion for the participants. Additionally, the specific position and coloured of the avatars was so intragroup similarity would be more salient.
5. *Poor Group* individuals were each allocated 100 experimental dollars and the *Poor Group Bank* had 0 experimental dollars. The *Rich Group* individuals were allocated 200 experimental dollars and the *Rich Group Bank* had 200 experimental dollars
    - Experimental dollar amounts were visually represented in brackets next to the avatars throughout the game.
    - The rationale behind the unfair advantage of experimental dollars was to make intergroup differences more salient.

6. Participants in each group interacted by allocating experimental dollars to the *Ingroup Bank*, *Outgroup Bank* and *Outgroup Individuals*. With each allocation of experimental dollars having a different rebate. For added realism, the participants could text-chat every second round for 60 seconds with "Individual", "Group" and "Everyone".

Figure 2: VIAPPL Arena



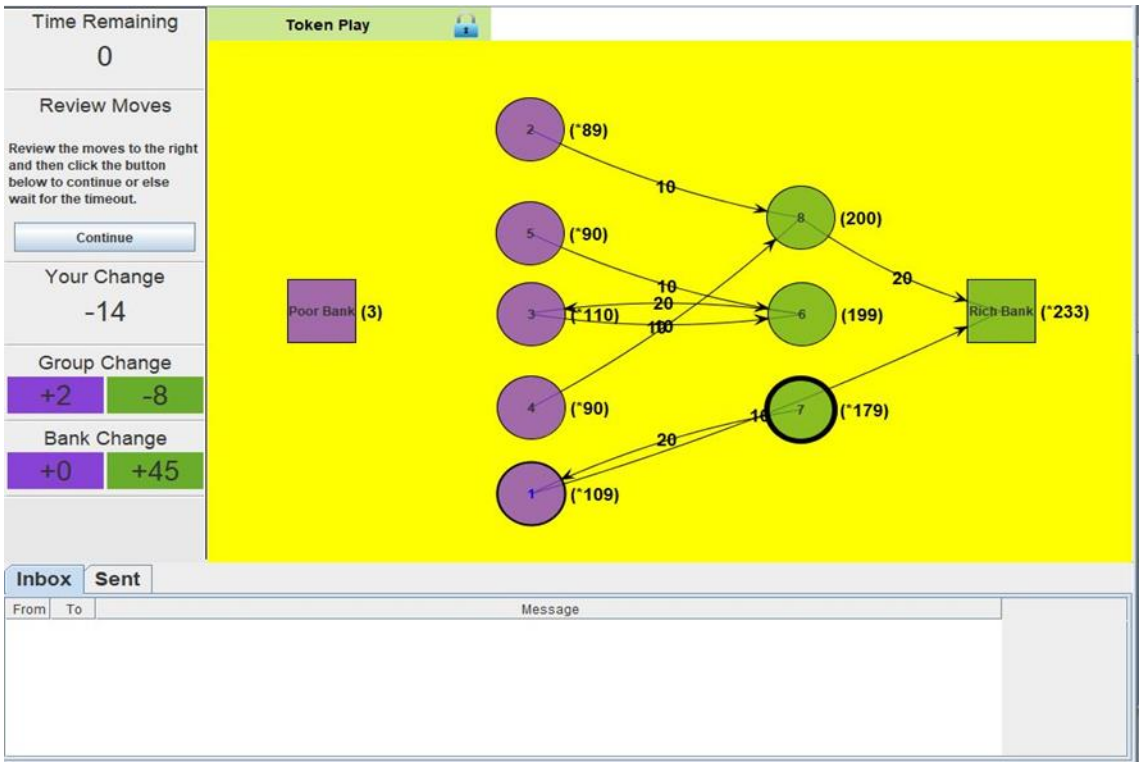
Allocation of Experimental Dollars

During each round the *Poor Group* members had to allocate 10 experimental dollars. However, the *Rich Group* members had 20 experimental dollars. All participants could choose how they "give away" their experimental dollars to try "get rich". Therefore, a participant was not limited to only one allocation but rather could choose to perform all exchange behaviours (trading, investing, donating) if they wished until they had used their allotted amounts (i.e., A *Poor Group* individual could donate a lump sum of 10 experimental dollars to one avatar or they could divide their 10 experimental dollars by distributing it amongst various avatars)

The participants were required to click a "SUBMIT" tab once all their experimental dollars for the round had been allocated. Once all 8 participants had clicked the "SUMBIT" tab a yellow background review screen labelled "Round Moves" would appear for 30 seconds. This "Round Moves" would show all the participants exchange behaviour for that round. Therefore, participants could see arrows linking avatars and the amount exchanged between those

different avatars. Additionally, Individual and Bank final experimental dollars for that round were displayed.

Figure 3: Allocation of Experimental Dollars



Rules of Exchange

1. *Investment and Donation*

When a participant "gives" experimental dollars to either an *Ingroup Bank* (investment) or an *Outgroup Bank* (donation) that particular "Bank" would receive the experimental dollars "given" plus a 50% rebate on the given amount.

- E.g., if a participant "invested/donated" 10 experimental dollars that "Bank" would receive 15 experimental dollars, the participant would only lose the "invested/donated" amount from their personal experimental dollars.

At the end of the *Get Rich Game*, the 'Banks" accumulated amount was shared equally with its respective group.

- I.e., the "Poor Bank" accumulated amount was shared equally between the 5 *Poor Group* members and the "Rich Bank" accumulated amount was shared equally between the 3 *Rich Group* members.

The investing to the *Ingroup Bank* was to operationalise group-interested exchange behaviour by directly competing over experimental dollars, whereas donating to the *Outgroup Bank* was to operationalise self-interested exchange behaviour by displaying outgroup helping.

2. Trade

Participants could not "give" experimental dollars to themselves or individuals from the same group (Ingroup Individual). Although, a participant could "give" experimental dollars to an individual in the opposite group (*Outgroup Individual*). In this "trade" with an *Outgroup Individual*, the participant received a 30% personal rebate on the amount "given" at the end of each round.

- E.g., if a participant "traded" 10 experimental dollars with an *Outgroup Individual*, they would lose 10 experimental dollars of their own personal wealth at the start of the "trade" (round), but they could expect a rebate of 3 experimental dollars added to their personal wealth at the conclusion of the "trade" (round).

Ultimately, this exchange behaviour was used to assess self-interested exchange behaviour of participants.

Like-rating, Trust-rating and Post-test Questionnaire

Once all 10 rounds had been completed. The participant had to rate how much they liked each participant from 1 (don't like the player at all) to 10 (like the player very much) (“Please rate how much you LIKE each player (except yourself)”). Then participant had to rate how much they trusted each participant from 1 (don't trust the player at all) to 10 (trust the player very much) (“Please rate how much you TRUST each player (except yourself)”). This Like- and Trust-rating data was not used in the analyse. The participants were then prompted with the post-test questionnaire that was embedded into the *Get Rich Game*. This questionnaire was identical to the pre-test questionnaire however the data was also not used to analyse Group Identification, Legitimacy and Social Dominance (see Appendix D).

Reimbursement

Individuals voluntarily participated in the *Get Rich Game* for a compensation of 40 South African Rands. This cash incentive for participating in the study was for their time and effort and not solely for the recruitment of individuals.

Methods of Analysis

Dependent Variables

Allocation of experimental dollars

The exchange behaviour was analysed with allocation of experimental dollars in the VIAPPL *Get Rich Game*. VIAPPL measured the experimental dollar allocation data as a count variable every round. VIAPPL's software collected this experimental dollar allocation behaviour data on a spreadsheet database that was then exported to a statistical processing software (R) for exchange behaviour analysis.

Ingroup Bank Giving

This was operationalised by the sum of experimental dollars invested by individuals to their *Ingroup Bank* over 10 rounds.

Outgroup Bank Giving

This was operationalised by the sum of experimental dollars donated by individuals to the *Outgroup Bank* over 10 rounds.

Outgroup Individual Giving

This was operationalised by the sum of experimental dollars individuals traded with *Outgroup Individuals* over 10 rounds.

The *Poor Group* counts of *Ingroup Bank-*, *Outgroup Bank-*, and *Outgroup Individual-* Giving had a range of 100, whereas the *Rich Group* had a range of 200. Since the *Poor Group* individuals were given 10 experimental dollars to allocate over 10 rounds and the *Rich Group* individuals were given 20 experimental dollars. The experimenter had to remove this major difference by normalising the two groups. This approximate standardised distribution was done by dividing the final amounts by the starting amount of experimental dollars. So, the *Poor Group* was divided by 10 and *Rich Group* was divided by 20, thus the final range of all scores was between 0 and 10.

Validity, Reliability and Rigour

This VIAPPL study ensured that there was a fairly robust internal validity. Due to the fact that the experimenters used a standard script (refer to Appendix A) when conducting the experiment. This was to assist in reducing the experimental effects that occur between experiments. Each experiment also followed strict control measures. These control measures were each participant had to scan their finger-print to ensure that they had not already

participated in the study, all participants were randomly assigned to an avatar in either the *Poor Group* or *Rich Group*, and the experimenter ensured that there was no verbal communication between participants while an experiment was underway.

Unfortunately, this study had a weak external validity due to its convenience non-probability sampling technique and sample consisting of only UKZN (Pietermaritzburg campus) students. However, the study was concerned with fundamental human behaviour.

Ethical Considerations

Due to the nature of this study, low risk deception was employed. Since participants were deceived by the experimenter in the *Individual Mobility (IM)*, *Group Mobility (GM)* and *Individual Mobility and Group Mobility (Individual + Group Mobility)* experimental conditions. Although there was this minor deception in the experimental conditions, the deception did not cause any distress to the participants, as the deception was only about whether the participants will trade places or/and there would be an economic revolution at the end of the game, however this trade or/and economic revolution never occurred. However, the participants were debriefed at the end of the game about the deception used by the experimenter to minimize any potential stress or harm caused. The experiment required interaction between participants, although due to the virtual nature of the *Get Rich Game* participants anonymity was maintained.

The researcher had to weigh the options of the R40.00 incentive as a reward. The experimenter deemed that the *Get Rich Game* not only had the financial reward of R40.00 for each participant's time but rather the *Get Rich Game* provided UKZN students with a wide range of rewarding experiences such as interpersonal, educational and financially rewarding experiences. Therefore, it was determined that the risk (minor deception) and incentives as rewards was reasonable in light of the potential benefit.

Gatekeeper's permission was granted from UKZN (see Appendix F). The Human Sciences Research Ethics Committee of the University of KwaZulu-Natal (see Appendix G) fully approved this study (Reference: HSS/0449/019M).

Refer to Appendix A for administrative details.

Chapter 5: Data Analysis

To determine whether the *Poor Group* and *Rich Group* perceptions of Social Mobility and Social Change resulted in either self-interested exchange behaviour or group-interested exchange behaviour, the experimenter needed to analyse the exchange of experimental dollars in this illegitimate situation. Since the experiment analysed allocation of experimental dollars it meant that this was a quantitative study. Therefore, to answer the hypotheses the experimenter imported the exchange behaviour data into R and analysed it with multilevel modelling (MLM). R was used because it is an available statistical software at UKZN that uses developed statistical tools, to conduct statistical methods such as MLM (Hayes, 2006). The statistical method of MLM was chosen because it allowed for the experimental dollar exchange behaviour outcomes to be measured by examining the variables independent and interactive effects (Hayes, 2006). Although MLM is computationally intense method it is not significantly different to the familiar ‘‘single-level’’ regression (Hayes, 2006). However, MLM is more versatile as MLM can estimate one or more coefficients or “effects” as fixed or random (Hayes, 2006). Therefore, a model was produced that uses several regression intercepts of *Ingroup Bank*-, *Outgroup Bank*- and *Outgroup Individual*-Giving and this allows for the single predictor of either self-interested exchange behaviour or group-interested exchange behaviour which has several regression coefficients (Hayes, 2006). However, the mathematics and theoretical assumptions MLM uses to produce the statistics requires large samples, which is why the study had a sample of 479 participants (Hayes, 2006). However, to ensure that the hypothesis of interest was correctly being tested, the experimenter was required to carefully plan the multilevel model (Hayes, 2006). Therefore, MLM had many advantages, and this is why the experimenter opted to analyse the data with R. The main advantage of MLM is that it can estimate exchange behaviour for individuals (*High* and *Low Status* at level 1) within games (Four experimental games at level 2) while considering the nesting of the 15 replications of the experimental conditions. Each participant is therefore “likely to be influenced similarly by processes and attributes that are characteristics of the” specific experimental condition (k=15) (Hayes, 2006, p. 387). This nesting feature provided the experimenter the opportunity to answer the questions in this study (Hayes, 2006).

VIAPPL Data Management

The VIAPPL software programme captured the data of exchange behaviour of experimental dollars. This data was then stored as a .csv file on the PsychLab computer server. Since each game was recorded on a separate .csv file, each separate file was imported to excel where the

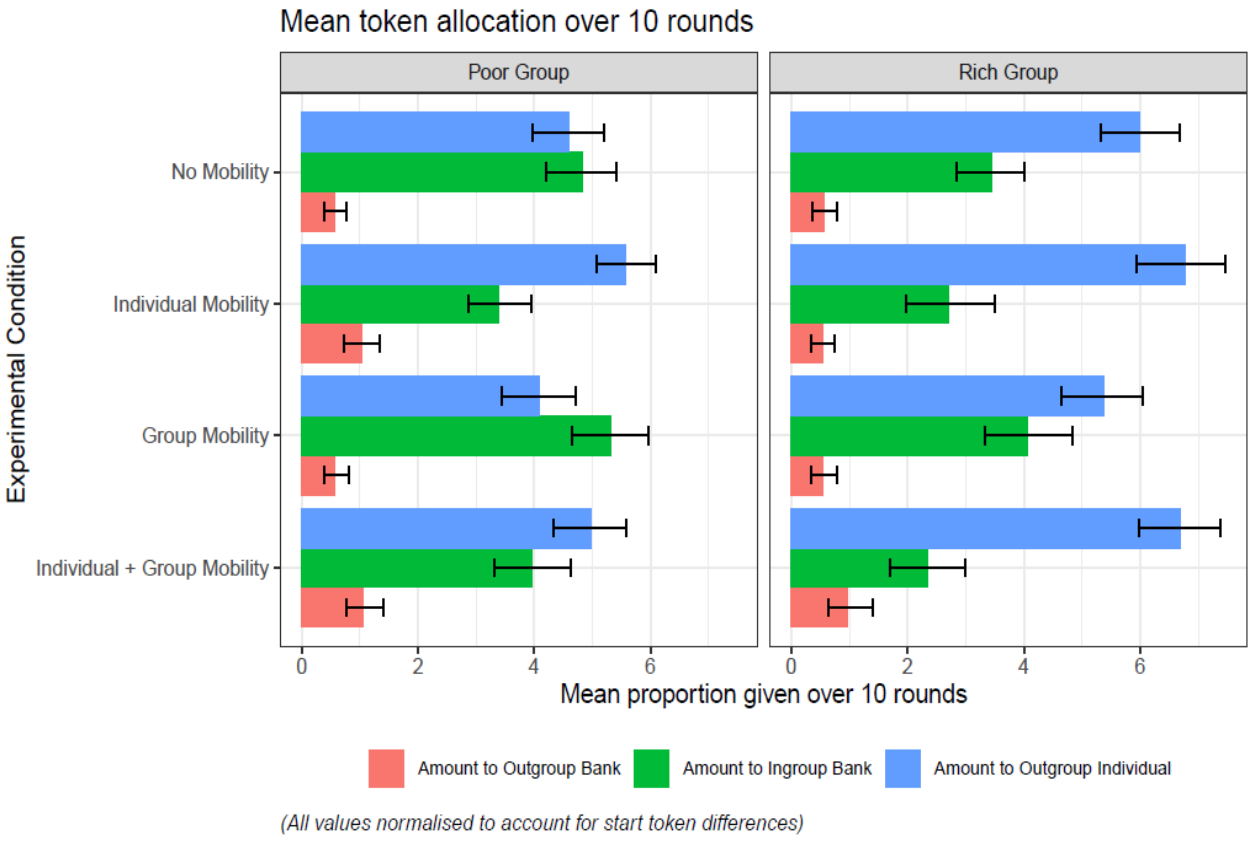
data was inspected and cleaned. Once all the files had been cleaned, the separate new cleaned .csv files were merged. This new merged .csv file was then imported to R (R Core Team, 2017) for analysis. This allowed for one row per person per game with exchange behaviour of experimental dollars aggregated over the 10 rounds. This exchange behaviour data of experimental dollars was then used to answer the hypothesises of this study. This was achieved by linear regression models as the experimental effects were modelled in regression. This was possible as R used the mixed linear models' package LME and LMER (Pinheiro, Bates, Debroy & Sarkar, 2017; R Core Team, 2017). The raw data that was used in the Excel spreadsheet and R output will be stored on a secure external hard-drive and the secured PsychLab computer server. This raw data will be stored for a minimum of five years.

Chapter 6: Results

Descriptive Statistics

The descriptive plots in Figure 4 below are simply preliminary suggestions and the below claims made about the *Poor Group* and *Rich Group* differences need to be supported by the F-test (*Modelling* statistics below provides the required F-test to support the claims).

Figure 4: Mean token allocation of the Poor Group and Rich Group over 10 rounds



1. Amount to Ingroup Bank

For both the *Poor Group* and *Rich Group*, *Group Mobility* had the highest frequency of *Ingroup Bank* investing. *Individual Mobility* had the lowest frequency of *Ingroup Bank* investing for the *Poor Group*, whereas *Individual + Group Mobility* had the lowest frequency of *Ingroup Bank* investing for the *Rich Group*. Overall, the *Rich Group* invest less experimental dollars to the *Ingroup Bank* compared to the *Poor Group*. Suggesting that when there is the perception of Social Change both *Poor Group* and *Rich Group* members will take part in group-interested exchange behaviour. However, *Low Status* increases group-interested exchange behaviour.

2. Amount to Outgroup Bank

For the *Poor Group*, *Individual Mobility* and *Individual + Group Mobility* had the highest frequency of *Outgroup Bank* donating. Whereas *No Mobility* and *Group Mobility* had the

lowest frequency of *Outgroup Bank* donating. For the *Rich Group, Individual + Group Mobility* had the highest frequency of *Outgroup Bank* donating. Whereas, *No Mobility, Individual Mobility* and *Group Mobility* had the same frequency of *Outgroup Bank* donating.

It is an interesting finding because *Outgroup Bank* donating does not have any direct individual rebates however when there is the perception of Social Mobility, the *Poor Group* will increase *Outgroup Bank* donating. This may be due to *Poor Group* members attempting to curry favour from all *Rich Group* members. Additionally, when there is the perception of both Social Mobility and Social Change both *Poor Group* and *Rich Group* members will increase *Outgroup Bank* donating. *Rich Group* members may be coaxing *Poor Group* members to defect from group-interested exchange behaviour. Whereby this coaxing is making *Poor Group* members increase *Outgroup Bank* donating in an attempt to curry favour from the *Rich Group* members. Therefore, *Individual Mobility* increase self-interested exchange behaviour.

3. Amount to Outgroup Individual

For both the *Poor Group* and *Rich Group, Individual Mobility* had the highest frequency of *Outgroup Individual* trading (Note: *Individual + Group Mobility* had the same frequency of *Outgroup Individual* trading for the *Rich Group*). Whereas *Group Mobility* had the lowest frequency of *Outgroup Individual* trading. Additionally, it appeared that the *Rich Group* trade more experimental dollars to the *Outgroup Individual* compared to the *Poor Group*. The perception of Social Mobility thus results in both *Poor Group* and *Rich Group* members taking part in self-interested exchange behaviour. However, *High Status* increases self-interested exchange behaviour.

Modelling

Multi-level modelling (LME and LMER packages in R) with maximum likelihood estimation was used to analyse the data of the three kinds of experimental dollar exchange behaviour (*Ingroup Bank, Outgroup Bank,* and *Outgroup Individual*) repeated by individuals (n=479), in the four experimental conditions (*No Mobility, Individual Mobility, Group Mobility, Individual Mobility and Group Mobility*) (Pinheiro et al., 2017; R Core Team, 2017). While considering the nesting of the experimental games replicated in each of the four experimental conditions. 60 nested games in total. Which allowed for self-interested exchange behaviour and group-interested exchange behaviour of individuals to be analysed. Therefore, answering the research question of this research dissertation. (See Appendix H for *To Ingroup Bank Modelling,*

Appendix I for *To Outgroup Bank Modelling* and Appendix J for *To Outgroup Individual Modelling*).

1. To Ingroup Bank

Preliminary Analyses

Preliminary analyses of individuals exchange behaviour of experimental dollars to the *Ingroup Bank* over 10 rounds indicated that the random intercept models significantly improved model fit, in comparison with the null model (model 1 AICnull = 2335.452). First only games were included as a random effect which improved fit over the null model (model 2 AIC = 2260.521; LRatio = 76.93016; df = 3; $p < .0001$). Model 1 and model 2 comparison therefore suggests that the difference within the different games is significant. The systemic differences between the different games were thus accounted for because it improved the fit of the model.

Intraclass Correlation

Then the Intraclass Correlation (ICC) of the dataset was calculated. The ICC model related to the amount of residual variance (unexplained variance or error variance) at a particular level. Therefore, the ICC (residual variance) is a reflection of the within-groups effect (Garson, 2019). Therefore, high ICC values are large residual variance coefficients – which indicates large differences within-groups (Xie, 2009). The Adjusted ICC was 0.289. Therefore 29% of the difference in *Ingroup Bank* giving can be explained by the experimental game. As a general rule of thumb that unexplained or random variance above 5% or 6%, the variance needs to be accounted for in the model. Therefore, the ICC informed the experimenter that the random effect nested within games is required as the residuals were approximately normally distributed with this nesting in place.

Predictive Model

The next step was to build the predictive models with the Independent Variables. Therefore, the experimenter added the three fixed effects (IM + GM + Status) to the model and compared the null model (model 4 AIC = 2260.5) against the model with the three fixed effects and random effect (model 5 AIC = 2222.0), treating the nested games as a random effect. Adding the fixed effects was significant and improved the fit (LRatio = 1.151; df = 3; $p < .0001$).

Model 5 which had the three fixed effects (IM+ GM+ Status), and random effect (nested games) was compared to model 6 which had a 3-way interaction (IM*GM*status) added to it. The 3-way interaction was not significant as the model did not improve fit (model 5 vs model

6: AIC = 2222.0 vs 2227.1; BIC = 2247.0 vs 2268.8; LogLik = -1105.0 vs -1103.6; deviance = 2210.0 vs 2207.1; $\chi 2$ = 44.553 vs 2.84; Df = 3 vs 4; p > .0001 vs p > 0.5849).

A model with two 2-way interactions was also produced, however this also did not significantly improve the fit. Therefore, all possible 2-way and 3-way interactions were run, however none of the interactions improved the model fit. Therefore, only model 5 with the three fixed effects and random effect needed to be reported.

Reported Model

The three Independent Variables (IM+ GM+ Status) were then compared. The first comparison was *Individual Mobility* (IMNO_IM). This comparison was significant (t = 3.267; df = 57.0557; p < 0.001) with a positive standardised regression coefficient (beta coefficient) (Estimate = 1.3383). This positive direction of the fixed effect suggests that *No Individual Mobility* results in more *Ingroup Bank* Giving than the *Individual Mobility* condition.

The second comparison was *Group Mobility* (GMNO_GM). This comparison was not significant (t = -0.941; df = 57.0557); however, the beta coefficient was negative (Estimate = -0.3854).

The third comparison was *Status* (statusrich). This comparison was significant (t = -5.893; df = 418.1630; p < 0.001) with a negative beta coefficient (Estimate = -1.2452). This negative direction suggests that the *Rich Group* results in less *Ingroup Bank* Giving than *Poor Group*.

An ANOVA (Type III with Satterthwaite) was also produced to confirm that only two of the three Independent Variables were significant. Individual Mobility (MS = 53.398; F = 10.6715; NumDF = 1; DenDF = 57.06; p < 0.01) and Status (MS = 173.751; F = 34.7238; NumDF = 1; DenDF = 418.16; p < 0.001) were both significant. Both the fixed effect model and general level ANOVA model have coefficients with 95% confidence intervals. Additionally, the approximate standardizations of the coefficient values which is scaled by the residual standard deviation also has a 95% confidence interval. Therefore, rather than just providing statistical significance, the results provide a sense of the substantive size of the effects.

Participants, therefore, invest more experimental dollars to the *Ingroup Bank* when there was *No Individual Mobility*. When there was the condition of *Individual Mobility* participants invested less experimental dollars to the *Ingroup Bank*. Additionally, participants invest less experimental dollars to the *Ingroup Bank* when they are in the *Rich Group*. When participants are in the *Poor Group*, they invest more experimental dollars to the *Ingroup Bank*.

The modelling for *Ingroup Bank* exchange behaviour does correlates with the descriptive statistics of the given "*Amount to Ingroup Bank*" in terms of *Low Status* increasing group-interested exchange behaviour. However, the modelling suggests that the experimental condition of *Group Mobility* is not significant. Although, the descriptive statistics of the given "*Amount to Ingroup Bank*" does show that the second highest frequency of *Ingroup Bank* investing, is the experimental condition of *No Mobility*. Therefore, when there is the perception of *No Individual Mobility* both *Poor Group* and *Rich Group* members will take part group-interested exchange behaviour.

2. To Outgroup Bank

Preliminary Analyses

Preliminary analyses of individuals allocating experimental dollars to *Outgroup Bank* over 10 rounds indicated that the random intercept models significantly improved model fit, in comparison with the null model (model 1.1 AICnull = 1467.195). First only games were included as a random effect, which did slightly improve fit over the null model (model 2.1 AIC = 1466.819; LRatio = 2.376085; df = 3; $p < 0.1232$). However, since the BIC increased (model 1.1 vs model 2.1: BIC = 1475.538 vs 1479.334) an unnested model would usually be used. However, the dataset did have a hierarchal data structure with nesting and additionally the other Dependent Variables were analysed with multi-level models. Therefore, it was decided that the use of a multi-level model had justification as there would be no harm running linear regression models as the other experimental effects were modelled in regression.

Intraclass Correlation

Then the ICC of the dataset was calculated. The Adjusted ICC was 0.040. Therefore 4% of the difference in *Outgroup Bank* giving can be explained by the experimental game. As a general rule of thumb that unexplained or random variance above 5% or 6%, the variance needs to be accounted for in the model. Therefore, the ICC supports the above finding of the AIC and BIC and informs the experimenter that the random effect nested within games is not required as the residuals were not approximately normally distributed with this nesting in place.

Predictive Model

The next step was to build the predictive models with the Independent Variables. Therefore, the experimenter added the three fixed effects (IM + GM + Status) to the model and compared the null model (model 4.1 AIC = 1466.8) against the model with the three fixed effects and

random effect (model 5.1 AIC = 1458.6), treating the nested games as a random effect. Adding the fixed effects was significant and improved the fit (LRatio = 0.002624; df = 6; p <.0.01).

Model 5.1 which had the three fixed effects (IM+ GM+ Status), and random effect (nested games) was compared to model 6.1 which had a 3-way interaction (IM*GM*status) added to it. The 3-way interaction was not significant as the model did not improve fit (model 5.1 vs model 6.1: AIC = 1458.6 vs 1462.1; BIC = 1483.6 vs 1503.8; LogLik = -723.30 vs -721.05; deviance = 1446.6 vs 1442.1; $\chi 2$ = 14.217 vs 4.5037; Df = 3 vs 4; p > 0.001 vs p > 0.3421).

A model with two 2-way interactions was also produced, however the change in fit was also not significant. The experimenter therefore ran all possible 2-way and 3-way interactions, however none of the interactions improved the model fit. Therefore, only model 5.1 with the three fixed effects and random effect needed to be reported.

Reported Model

The first comparison was *Individual Mobility* (IMNO_IM). This comparison was significant (t = -3.437; df = 56.69202; p < 0.001) with a negative beta coefficient (Estimate = -0.36769). This negative direction of the fixed effect suggests that *No Individual Mobility* results in less *Outgroup Bank* Giving than the *Individual Mobility* condition.

The second comparison was *Group Mobility* (GMNO_GM). This comparison was not significant (t = -0.855; df = 56.69202); however, the beta coefficient was negative (Estimate = -0.09144).

The third comparison was *Status* (statusrich). This comparison was not significant (t = -1.535; df = 418.02881); however, the beta coefficient was negative (Estimate = -0.15804). Since the Independent Variable of *Status* was not significant, it surprising suggested that both *Rich Group* and *Poor Group* give to the *Outgroup Bank* at the same rate.

An ANOVA (Type III with Satterthwaite) was also produced to confirm that only one of the three Independent Variables was significant. Individual Mobility (MS = 14.0465; F = 11.8163; NumDF = 1; DenDF = 56.69; p < 0.001) was significant.

Participants, therefore, donated less experimental dollars to the *Outgroup Bank* when there was *No Individual Mobility*. When there was the condition of *Individual Mobility* participants donated more experimental dollars to the *Outgroup Bank*. Although both *Rich Group* and *Poor Group* members are donating to the *Outgroup Bank* at the same rate. Due to the condition of *Individual Mobility* being significant it suggests that both *Rich Group* and *Poor Group*

members donate experimental dollars at a much higher rate to the *Outgroup Bank* when under the condition of *Individual Mobility*. Therefore, suggesting that the *Individual Mobility* conditions encourages *Outgroup Bank* Giving.

The modelling for the experimental condition of *Individual Mobility* was significant and the experimental condition of *Group Mobility* was not significant. Therefore, this suggest that when there is the perception of both Social Mobility and Social Change, it is the *Individual Mobility* which encourages both *Poor Group* and *Rich Group* members to donate to the *Outgroup Bank*. This correlates with the descriptive statistics of the given "*Amount to Ingroup Bank*" because *Individual Mobility* resulted in the highest frequency of *Outgroup Bank* donating for *Poor Group* individuals. However, because *Status* was not significant it suggests that it is not group membership that influences *Outgroup Bank* donating but rather both groups are giving the same amount to the *Outgroup Bank*. Therefore, it is *Individual Mobility* influencing *Outgroup Bank* Giving.

3. To Outgroup Individual

Preliminary Analyses

Preliminary analyses of individuals allocating experimental dollars to *Outgroup Individuals* over 10 rounds indicated that the random intercept models significantly improved model fit, in comparison with the null model (model 1.2 AICnull = 2324.179). First only games were included as a random effect, which improved fit over the null model (model 2.2 AIC = 2260.957; LRatio = 65.22157; df = 3; p <.0001). Model 1.2 and model 2.2 comparison therefore suggests that the difference within the different games is significant. The systemic differences between the different games were thus accounted for because it improved the fit of the model.

Intraclass Correlation

Then the ICC of the dataset was calculated. The Adjusted ICC was 0.262. Therefore 26% of the difference in *Outgroup Individual* giving can be explained between experimental game differences. As a general rule of thumb that unexplained or random variance above 5% or 6%, the variance needs to be accounted for in the model. Therefore, the ICC informed the experimenter that the random effect nested within games is required as the residuals were approximately normally distributed with this nesting in place.

Predictive Model

The next step was to build the predictive models with the Independent Variables. Therefore, the experimenter added the three fixed effects (IM + GM + Status) to the model and compared the null model (model 4.2 AIC = 2261.0) against the model with the three fixed effects and random effect (model 5.2 AIC = 2217.7), treating the nested games as a random effect. Adding the fixed effects was significant and improved the fit (LRatio = 1.14; df = 3; $p < .0001$).

Model 5.2 which had the three fixed effects (IM+ GM+ Status) and random effect (nested games) was compared to model 6.2 which had a 3-way interaction (IM*GM*status) added to it. The 3-way interaction was not significant as the model did not improve fit (model 5.2 vs model 6.2: AIC = 2217.7 vs 2224.7; BIC = 2242.7 vs 2266.4; LogLik = -1102.8 vs -1102.4; deviance = 2205.7 vs 2204.7; $\chi 2$ = 49.275 vs 0.9459; Df = 3 vs 4; $p > .0001$ vs $p > 0.9179$).

A model with two 2-way interactions was also produced, however this was also not significant. The experimenter therefore ran all possible 2-way and 3-way interactions, however none of the interactions improved the model fit. Therefore, only model 5 with the three fixed effects and random effect needed to be reported.

Reported Model

The first comparison was *Individual Mobility* (IMNO_IM). This comparison was significant (t = -2.399; df = 57.0623; $p<0.05$) with a negative beta coefficient (Estimate = -0.9724). This negative direction of the fixed effect suggests that *No Individual Mobility* results in less *Outgroup Individual* Giving than the *Individual Mobility* condition.

The second comparison was *Group Mobility* (GMNO_GM). This comparison was not significant (t = 1.172; df = 57.0623); however, the beta coefficients was positive (Estimate = 0.4751).

The third comparison was *Status* (statusrich). This comparison was significant (t = 6.653; df = 418.1709; $p < 0.0001$) with a positive beta coefficient (Estimate = 1.4009). This positive direction suggests that the *Rich Group* result in more *Outgroup Individual* Giving than *Poor Group*.

An ANOVA (Type III with Satterthwaite) was also produced to confirm that only two of the three Independent Variables were significant. Individual Mobility (MS = 28.588; F = 5.7545; NumDF = 1; DenDF = 57.06; $p < 0.05$) and Status (MS = 219.925; F = 44.2683; NumDF = 1; DenDF = 418.17; $p < 0.0001$) were both significant.

Participants, therefore, trade less experimental dollars to the *Outgroup Individuals* when there was *No Individual Mobility*. When there was the condition of *Individual Mobility* participants traded more experimental dollars to the *Outgroup Individuals*. Suggesting that *Individual Mobility* promotes *Outgroup Individual* Giving. Model 5.1 suggests that the *Individual Mobility* condition results in more *Outgroup Bank* Giving, however Model 5.2 suggests that the *Individual Mobility* condition promotes *Outgroup Individual* Giving.

Participants, therefore, trade more experimental dollars to the *Outgroup Individuals* when they are in the *Rich Group*. When participants are in the *Poor Group*, they trade less experimental dollars to the *Outgroup Individuals*. It was taken into account that the *Rich Group* and *Poor Group* could exchange different amount of experimental dollars per round. This was corrected for by measuring the Dependent Variable for both groups on the same scale. Therefore, *Rich Group* individuals trade more experimental dollars to *Poor Group* individuals compared to *Poor Group* individuals who trade less experimental dollars to *Rich Group* individuals.

The modelling for *Outgroup Individual* Giving correlates with the descriptive statistics of given "*Amount to Outgroup Individual*". Therefore, when there is the perception of Social Mobility both *Poor Group* and *Rich Group* members will take part in self-interested exchange behaviour. However, High *Status* increases self-interested exchange behaviour.

Chapter 7: Discussion

In sum, the findings suggest that *Individual Mobility* and *Status* are the factors which promote or demote either self-interested exchange behaviour or group-interested exchange behaviour.

Individual Mobility

The effect of *Individual Mobility* results in less investing to the *Ingroup Bank* but more donating and trading with the *Outgroup Bank* and *Outgroup Individual* respectively. This seems to suggest that the condition of *Individual Mobility* results in the perception of Social Mobility which makes participants take part in self-interested exchange behaviour. However, the effect of *No Individual Mobility* results in the perception of no Social Mobility, which makes participants take part in group-interested exchange behaviour.

Group Mobility

Group Mobility has no effect on exchange behaviour, but this could possibly be because the self-interested exchange behaviour and group-interested exchange behaviour had no bearing in this context or because the prime did not have enough power. Although, the findings do suggest that when individuals have the perception of both Social Mobility and Social Change, participants would rather opt for self-interested exchange behaviour instead of group-interested exchange behaviour.

Status

The effect of *Status* is that *High Status* results in less investing to the *Ingroup Bank* but more trading with the *Outgroup Individual*. Therefore, *High Status* results in greater self-interested exchange behaviour. A *Low Status* results in more investing to the *Ingroup Bank* but less trading with the *Outgroup Individual*. Therefore, *Low Status* results in greater group-interested exchange behaviour. However, *High Status* and *Low Status* results in the same amount of donating to the *Outgroup Bank*, which is self-interested exchange behaviour.

Group-Interested Exchange Behaviour

What are the factors that incentivises group-interested exchange behaviour? The results of this research dissertation seem to suggest that it is a *Low Status* and when there is the perception of *No Individual Mobility* (no social mobility). Therefore, social identity processes of positive distinctiveness and categorisation are what motivated participants to take part in group-interested exchange behaviour (Simpson, 2006).

Low Status

In the *Get Rich Game* when participants were randomly assigned to the *Poor Group*, they would invest more to *Ingroup Bank*. This group-interested exchange behaviour arose from social comparison indicating that the *Rich Group* was better (Trepte & Loy, 2017; Ellemers, 1993; Hogg & Abrams, 1988). *Poor Group* members self-esteem was therefore threatened because they had a negative social identity attached to their group membership (Trepte & Loy, 2017; Ellemers, 1993; Hogg & Abrams, 1988). This diminished self-esteem and negative social identify made *Poor Group* members want to improve their current situation in the experimental game (Trepte & Loy, 2017; Ellemers, 1993). *Poor Group* members therefore needed to minimise the social stigma attached to them by their *Low Status* (Hogg, 2016). They therefore needed to somehow promote their groups positivity (Hogg, 2016). The individual strategy of *Outgroup Individual* trading would not overcome this inequality and therefore to renegotiate the status quo they realised that there was a need for group strategies (Ellemers et al., 1997). *Poor Group* members thus collectively invested to the *Poor Bank* so they could alter their *Poor Status* into a *Rich Status* (Trepte & Loy, 2017; Hogg, 2016; Bettencourt et al., 2001; Ellemers, 1993; Hogg & Abrams, 1988). As they believed that by directly competing over status with the *Rich Group*, they could find relief from their hurt social identity and low self-esteem (Trepte & Loy, 2017; Hogg, 2016; Bettencourt et al., 2001; Ellemers, 1993; Hogg & Abrams, 1988).

However, for a *Low Status* to produce group-interested exchange behaviour there needs to be a situation where there are unstable status relations between the *Rich Group* and *Poor Group* (Durrheim et al., 2016). Due to the nature of the "Dot Estimation Task", the *Get Rich Game* had an illegitimate obtained status hierarchy. This illegitimacy is known to make *Poor Group* members take part in group-interested behaviour (Durrheim et al., 2016). This is because the *Poor Group* members do not accept the *High Status* of the *Rich Group* (Bettencourt et al., 2001). This created a cognitive alternative in the *Poor Group* members and made the *Rich Group* members feel insecure about their higher social status (Bettencourt et al., 2001). This insecurity thus made the illegitimate hierarchical structure perceived to be unstable (Hogg, 2016; Bettencourt et al., 2001). Additionally, instability was enhanced because participants were not made aware of the number of rounds in the game. Therefore, this illegitimacy and instability further increased *Poor Group* members taking part in group-interested exchange behaviour. This is because they believe that they had a critical ideology and blueprint to renegotiate the status quo inequality and thus gain positive distinctiveness (Trepte & Loy,

2017; Durrheim et al., 2016; Hogg, 2016; Bettencourt et al., 2001; Ellemers et al., 1997; Hechter, 1988).

No Individual Mobility

Additionally, for there to be group-interested exchange behaviour the boundaries need to be perceived as impermeable (Durrheim et al., 2016). Therefore, *No Individual Mobility* resulted in group-interested exchange behaviour because group members tend to favour their group when allocating experimental dollars (Durrheim et al., 2016). Therefore, the *Get Rich Game* made all social encounters at the intergroup extreme of the continuum because there was no possible way of changing groups (Tajfel, 1981). Group membership therefore determined all behaviour because both groups thought of each other in terms of group membership (Tajfel, 1969). Therefore, participants perceived their groups needs as being more important than their own individual needs thus membership of a participant determined that they should take part in the group strategy of *Ingroup Bank* investing (Tajfel, 1969).

Self-Interested Exchange Behaviour

What are the factors that incentivises self-interested exchange behaviour? The results of this research dissertation seem to suggest that it is a *High Status* and when there is the perception of *Individual Mobility* (social mobility). Therefore, intergroup compensatory helping and social encounters being on the interpersonal end of the interpersonal-intergroup continuum are what motivated participants to take part in self-interested exchange behaviour (Hogg, 2016; Ding et al., 2017)

High Status

In the *Get Rich Game,* participants randomly assigned to the *Rich Group,* traded more to the *Outgroup Individual.* This *Outgroup Individual* trading may have been due to the social dilemma of social responsibility (Ding et al., 2017). Due to the nature of the "Dot Estimation Task", the *Get Rich Game* had an illegitimate obtained status hierarchy therefore *High Status* members were responding to unfairness with appropriate compensatory helping to the *Low Status* members (Durrheim et al., 2016; Rubin, Badea & Jetten, 2014; Bettencourt et al., 2001). This *Outgroup Individual* trading was therefore a way for the *High Status* members to share resources with *Low Status* members so their welfare could be promoted because the *Rich Group* had double the amount of experimental dollars (Ding et al., 2017).

However, a counter argument to this noblesse oblige is that *High Status* members believed that their economic advantage was well-deserved therefore their enhanced resources was validated

(Ding et al., 2017; Jost et al., 2004; Lerner, 1980). *Rich Group* members therefore viewed the social change as a threat to their own status position (Hutter, 1970). To defend their *High Status* position and have asymmetric control over economic resource, *Rich Group* members promoted the idea that a limited amount of *Poor Group* members could pass into the *Rich Group* with intergroup compensatory helping (*Outgroup Individual* trading) (Ding et al., 2017; Hogg, 2016; Magee & Galinsky, 2008; Jackson, Sullivan, Harnish, & Hodge, 1996; Ellemers, 1993; Hutter, 1970). Therefore, because the *Rich Group* was perceived to have more power than the *Poor Group*, they unconsciously used this intergroup compensatory helping as a way to coax *Poor Groups* to defect, so their group-interested exchange behaviours were undermined and prevented (Hogg, 2016; Ellemers et al., 1988)

Individual Mobility

The condition of *Individual Mobility* produced the perception of social mobility by making the participants believe that the boundaries between the *Rich Group* and *Poor Group* were soft and easy to cross (Hogg, 2016). This results in diminished group-interested exchange behaviour because in this type of situation the *Poor Group* members believe that the status quo could never change (Hogg, 2016; Jackson et al., 1996; Ellemers, 1993; Hutter, 1970). This is because when there are permeable boundaries individuals usually take part in self-interested exchange behaviour (Durrheim et al., 2016; Hogg, 2016; Jackson et al., 1996; Ellemers, 1993; Hutter, 1970). Thus, *Poor Group* members tried to leave and disidentify with the *Poor Group* while trying to gain acceptance into the *Rich Group* by *Outgroup Individual* trading because they desired to improve their own personal situation (Trepte & Loy, 2017; Hogg, 2016; Jackson et al., 1996; Ellemers, 1993; Hutter, 1970). *Poor Group* members therefore tried to enhance their own social identity by opting for self-interested exchange behaviour (Jackson et al., 1996). However, intergroup boundaries are rarely permeable therefore it was highly unlikely that the *Poor Group* member would pass into the *Rich Group* (Trepte & Loy, 2017; Hogg, 2016).

The *Rich Group* members promoted the idea of social mobility to defend their *High Status* and preserve their position in the unequal hierarchical structure (Nadler & Halabi, 2006; Doosje et. al., 2002; Ellemers, 1993; Hechter, 1988). The *Rich Group* members therefore tried to coax *Poor Groups* to defect from group-interested exchange behaviour because any form of social change was a threat to their *High Status* position (Hogg, 2016; Ellemers, 1993; Hutter, 1970). The *Rich Group* members used intergroup compensatory helping because it promoted the idea of social mobility (i.e., the America dream) (Hogg, 2016; Jackson et al., 1996). (Hogg, 2016; Jackson et al., 1996). Since this gave *Poor Group* members the idea that a limited amount of

Poor Group members could have a *High Status* (Hogg, 2016; Jackson et al., 1996; Hutter, 1970).

Additionally, those people taking part in individual strategies were excluded from both groups, thereby experiencing social identity limbo which further decreased group strategies because participants perceived their own individual needs as being more important than their group's needs (Hogg, 2016; Jackson et al., 1996; Ellemers, et al., 1993). Therefore, the social encounter was on the interpersonal end of the interpersonal-intergroup continuum and therefore the personal relationships between the participants, as well as their characteristics, determined the exchange behaviour (Tajfel, 1981).

Finding of Interest for Future Studies

The findings of the research dissertation found that the *Rich Group* and *Poor Group* members donated at the same rate to the *Outgroup Bank,* but the effect of *Individual Mobility* encouraged both *Rich Group* and *Poor Group* members to donate to the *Outgroup Bank* at much higher rates. Although, *Individual Mobility* has been known to produce self-interested exchange behaviour, this was an interesting finding because it suggested that regardless of group membership, a participant would take part in self-interested exchange behaviour if the situation allowed for it (Ellemers et al., 1993; Rabbie, Schot & Visser, 1989; Jackson et al., 1996). Therefore, it was not necessarily the social categories of *High Status* and *Low Status* that influenced a participants exchange behaviour but rather interdependence of fate (Rabbie et al., 1989).

In the *Get Rich Game*, the *Individual Mobility* resulted in a situation where the only way to personally secure the most experimental dollar, the participants needed to reciprocate and cooperate with outgroup members (Rabbie et al., 1989). This meant that both *Rich Group* and *Poor Group* members were mutually dependent on each other (Rabbie et al., 1989). Participants therefore traded to *Outgroup Individuals* to create a direct exchange system with individual outgroup members (Durrheim et al., 2016; Yamagishi & Mifune, 2008; Gaertner & Insko, 2001; Yamagishi & Kiyonari, 2000; Yamagishi, Jin, Kiyonari, 1999). However, a generalised exchange system was created with all *Outgroup Individuals* when donating to the *Outgroup Bank*, because it showed all outgroup members that they could be favoured by and dependent on a participant from another group (Durrheim et al., 2016; Yamagishi & Mifune, 2008; Jetten et al., 1996; Rabbie et al., 1989; Diehl, 1989; Locksley et al., 1980). This generalised exchange system therefore weakened group-interested exchange behaviour of both groups, possibly even reversing group-interested exchange behaviour (Durrheim et al., 2016;

Yamagishi & Mifune, 2008; Jetten et al., 1996; Rabbie et al., 1989; Diehl, 1989; Locksley et al., 1980).

This *Outgroup Bank* donating from *Rich Group* members was thus a way to coax all *Poor Group* members to defect from group-interested exchange behaviour (Yamagishi & Mifune, 2008; Yamagishi & Kiyonari, 2000; Yamagishi, et al., 1999; Jetten et al., 1996; Rabbie et al., 1989; Diehl, 1989; Locksley et al., 1980). Whereas this *Outgroup Bank* donating from *Poor Group* members was a way to curry favour from all *Rich Group* members so the *Rich Group* individuals could trade directly with them. This seems to suggest that individuals are always self-interested because regardless of ingroup or outgroup membership, because participant would allocate resources, to participants they deem to be the most dependent on (Durrheim et al., 2016; Rabbie et al., 1989). This was because when given the option to either take part in self-interested exchange behaviour or group-interested exchange behaviour, participants of both groups would rather take part in the self-interested exchange behaviour with the *Outgroup Bank* so they could receive *Outgroup Individual* trading (Rabbie et al., 1989).

Chapter 8: General Discussion

What does the influence of *Status* and *Individual Mobility* have on an economic Social Dilemma? Although, group members tend to favour group-interested exchange behaviour, this requires for the specific conditions of impermeable boundaries and unstable status relation between groups to be met (Durrheim et al., 2016). This group-interested exchange behaviour does occur occasionally, because MGPs have shown that intergroup interdependencies can make individuals act against their immediate economic self-interest (Tajfel et al., 1971). Therefore, if the situation allows for it, individual will unequivocally decline greater self-interested economic needs to ensure that their group is relatively better off than another group (Durrheim et al., 2016). However, if these specific conditions do not occur, group-interested exchange behaviour is removed (Durrheim et al., 2016).

Individuals are therefore constantly comparing self-interested exchange behaviour and group-interested exchange behaviour (Tajfel, 1970). This is because depending on the cultural norms or experimental norms, the importance of acting appropriately differs and in turn determines the value of these exchange behaviours (Durrheim et al., 2016; Gaertner & Insko, 2001). Unfortunately, our modern society is a Capitalistic society with the American Dream always being sold to us. This American Dream legitimises the illegitimate society and thus makes it a stable society. This has negative effects on group-interested exchange behaviour for *Low Status* members. This is because *Poor Group* members deem the social system to be stable which results in *Outgroup Individual* trading and thus diminished group-interested exchange behaviour required to renegotiate the unequal status quo (Hogg, 2016; Tajfel & Turner, 1979; Tajfel & Turner, 1986).

Additionally, in terms of the *Get Rich Game*, our society could be considered an *Individual Mobility* condition because the boundaries between *High Status* and *Low Status* are permeable. Suggesting that our society does not meet the specific conditions for group-interested exchange behaviour (Durrheim et al., 2016). Therefore, it is highly unlikely that in our economic Social Dilemma society, individuals will act with group-interested exchange behaviour because studies have shown that in conditions that have outgroup dependence, group-interested exchange behaviour has been completely reversed (Rabbie et al., 1989).

Our society does have social expectations which result in humans behaving the way they do (Durrheim et al., 2016; Tajfel, 1972). It is therefore expected that *High Status* individuals be benevolent to *Low Status* individuals (Durrheim et al., 2016). However, this study has shown

that benevolence is simply a way to coax *Poor Group* individuals to defect from group-interested exchange behaviour. Additionally, studies have shown that group-interested exchange behaviour is terminated when an individual is given feedback that it is not ingroup member that favoured them but rather an outgroup member (Locksley, Ortiz & Hepburn, 1980).

The human motive to act appropriately influences our unconscious behaviour however this behaviour is effective at dividing the *Poor Group* (Durrheim et al., 2016; Condor, 2003; Tajfel, 1972). It divides because it creates a situation where *Low Status* individuals' social encounters are on the interpersonal end of the interpersonal-intergroup continuum (Durrheim et al., 2016; Hogg, 2016; Condor, 2003). In Capitalistic terms it creates a situation where lower class individuals are trying to gain acceptance into the middle class and middle class individuals are trying to gain acceptance into the upper echelon. Essentially there are no groups at all or at a minimum, many small separate groups. When there is no group identification, a situation arises where there can never be group-interested exchange behaviour to overcome the unfair inequality (Durrheim et al., 2016; Hogg, 2016). Our unfair society is therefore a society of individuals with hurt self-esteems that are constantly trying to repair their social identity with self-interested exchange behaviour (Trepte & Loy, 2017; Hogg, 2016; Bettencourt et al., 2001; Ellemers, 1993; Hogg & Abrams, 1988).

Unfortunately, individuals measure their self-esteem on their economic status in our society. However, due to the nature of capitalism there will always be economic *Status* differentials. *Rich Group* members will take part in self-interested exchange behaviour and *Poor Group* members will attempt to take part in group-interested exchange behaviour however their group-interested exchange behaviour will be extinguished due to the effect of *Individual Mobility* always being present. The perception of Social Mobility therefore results in pernicious self-interested exchange behaviour and diminished group-interested exchange behaviour. It was observed in this study, that even when there was the perception of both Social Mobility and Social Change and participants could perform either self-interested exchange behaviour or group-interested exchange behaviour. Participants would rather opt for self-interested exchange behaviour. This is because self-interested exchange behaviour increases our own personal economic resources and in a capitalistic society this increases our own status and prestige. This increased status and prestige thus satisfises our strong desire to have a positive evaluation of self (Trepte & Loy, 2017; Hogg, 2016).

Chapter 9: Limitations

The *Group Mobility* condition which was meant to produce a belief of social change, but it was not significant in all the games. From literature it was hypothesised that it would produce group-interested exchange behaviour (Trepte & Loy, 2017; Hogg, 2016). However, it is possible that because participants were paid a fixed sum at the end of the *Get Rich Game* it resulted in group-interested exchange behaviour disappearing (Karp, Jin, Yamagishi & Shinotsuka, 1993). Possibly *Rich Group* members and *Poor Group* members may have been participating in social creativity and therefore self-interested exchange behaviour and group-interested exchange behaviour may have had no bearing because social creativity resulted in groups redefining their ingroups social value and attributes by comparing the ingroup to the outgroup on a new dimension or they could have been simply avoiding upward comparison (Trepte & Loy, 2017; Hogg, 2016). The prime itself may not been enough to make participants have the subject belief of social change (Hogg, 2016).

The limitation of the sampling technique was that there was a lack of generalisability. As this is a major disadvantage linked to convenience sampling. The population used to acquire the sample was also a limitation as it resulted in the sample consisting only of university students. Previous research suggests that the data obtained by university students should be interpreted with caution (Henrich, Heine & Norenzayan, 2010). Since university students are a representation of a sector of the general population that has disproportionately higher levels of education and belong to a socio-economic stratum that is more privileged (Henrich et al., 2010).

Studies also have shown that males exhibit group-interested exchange behaviour only when they are dependent on their group, whereas females exhibited group-interested exchange behaviour regardless of the dependence structure therefore gender may have been needed in the multilevel model (Gaertner & Insko, 2000).

The pre-test questionnaire and post-test questionnaire which assessed the psycho-social aspects of Group Identification, Legitimacy and Social Dominance was not used in the analyse. This data should be used in future studies to determine if *Rich Group* members find their *High Status* as unfair or well-deserved. As this could help determine whether their intergroup compensatory helping (*Outgroup Individual* trading) was a result of noblesse oblige or way to coax *Poor Groups* to defect, so their group-interested exchange behaviour is undermined and prevented.

Chapter 10: Conclusion

This research dissertation adopted an evolutionary approach to studying exchange behaviour because the *Get Rich Game* was designed in such a way that the social categorisation and situation manipulations were not tested independently which showed that *Status* and *Individual Mobility* produce either self-interested exchange behaviour or group-interested exchange behaviour in asymmetrical groups (Durrheim et al., 2016; Everett et al., 2015; Stroebe et al., 2005).

The findings of the research dissertation support existing literature on Social Dilemmas and SIT. Therefore, it was expected that the two unequal groups in the illegitimate social structure acted the way they did when the situation allowed for it. However, the results did produce a finding of interest that benevolence/donating is a way to coax or curry favour so all individuals' defect from group-interested exchange behaviour which the experimenter thinks should be explored in future studies. Additionally, although, Tajfel (1972) explained that MGP data should be subjected to cultural analysis because the human motive to act appropriately is what produces our behaviour (Durrheim et al., 2016; Condor, 2003). However, possibly the Social Mobility culture of today's world is what should be studied because our Capitalistic society deems what appropriate behaviour one should do but this societal behaviour is making individuals more and more self-interested.

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Appendix A: Administrative Details & Standard Script

Pre-experiment Procedure

- Once all 8 participants' fingerprints have been taken and seated at a computer: "Thank you for participating in this study. This study is called Get Rich". Read through the information sheet: "Do you still want to take part in the study, or do you have any questions?". Participants to sign the consent form. Once all collect: "We are conducting this experiment for our Research Psychology Masters research project. The quality of the data is important for us. So, please may you avoid looking and chatting to each other during the experiment and please may you concentrate while playing the game and answering the questions".

Experimental Procedure

1. Create Participants account: register new username and password, access code to enter the game to be added before the students are seated.
    - "As you can see in front of you there is a pop up screen. Please click register and fill in you details. Once you have registered, please fill in your username and password and click login. This information is not used and please raise your hand if you need any help."
2. Group Allocation
    - Participants will then be presented with the "Dot Estimation Test": "Please follow the instructions. This will take you to a dot estimation test that will then allocate you to a group."
    - Once the "Dot Estimation Test" appears: "You have to guess how many dots on the screen and your estimation will assign you to one of two groups"
3. Demographics and Pre-test Questionnaire
    - Once all participants have submitted their estimates a demographics and Pre-test Questionnaire will appear: "The pop up menu in front of you is a questionnaire, please chick start and a Windows Explorer page will open, please fill in the questions. Once you click submit it will say thank you, you can now close the window with the red x on the top right hand corner. Once this is closed you, can click completed."
4. Trial 1 (Practice trail)

- “The screen in front of you is the Get Rich game. Take some time to study the screen.”
- “You are the player that has the thick black ring around you. Can you all identify yourself? Who can’t? Everyone can see themselves?”
- “Can you see that there is a large purple group and a small green group? The purple group is the poor group, and the green group is the rich group. Can everyone identify what group you are in? Remember the black ring shows who you are.”
- “So, in this game you have to give a certain amount of dollars away. It is a form of investment because when you give those dollars away, the value grows. These are the things you can do to get rich:”
    1. “You can give to your bank or the other bank. When you do that, the bank will grow by 50%. So, if you give away 10 dollars the bank is going to receive 15. So, you can grow money in your bank, or you can grow money in the other bank if you want to.”
    2. “The other way in which you can give, is you can give to an out-group player. An out-group player is someone who is not in the same group as you. You cannot give to an in-group player or to yourself. So, you can’t give amongst your own group, but you can give to an out-group player. If you give to an out-group player, you personally will receive 30% back. So, if you give 10 dollars, you going to get back 3 dollars.”
- “Do you understand those rules? Any questions?”
- “When giving dollars away the rich group must give 20 dollars, the poor group can only give 10 dollars. However, the way you choose to allocate your dollars is up to you. So, you can give any amount away at a time, but all together you must either give 20 dollars if you in the rich group or 10 dollars if you are in the poor group.”
- “In this game you want to get rich, you get rich by giving dollars away and it grows.”
- Depending on what experimental condition explain:
    1. <u>Group Mobility</u>:

        “In this particular game if the poor group/purple group bank grows a lot compared to other banks in previous games. The poor group is going to

get the full bank from the rich group/green group. The 200 dollars is going to go to the poor group. Because the poor group started off poor. So, if the poor group does well, they are going to get all the dollars from the rich groups bank. Do you understand that?"

2. Individual Mobility:

   "Something else in this game, the player from the poor group that does best. In other words, the player that becomes the richest in the poor group, they going to get the chance to move to the rich group and get the rich group bank. The person in the rich group who does the worst, will then move to the poor group. Do you all understand the rules of the game? "

3. Individual + Group Mobility explain both 1 and 2
4. No Mobility go straight to recap

- Recap:
  1. "We play by giving per round. The rich must give 20 dollars and the poor must give 10 dollars."
  2. "You can give to either of the banks and it will grow by 50%. Or you can give to another player in the out-group, and you are going to get 30% back to your own account."
  3. Group Mobility: "If the poor group does well, the poor group will get the rich groups bank and now they will become rich."
  4. Individual Mobility: "The player who does the worst in the rich group, will go down to the poor group and the player who does best in the poor group will go to the rich group. Worst in the rich group goes down and the best in the poor group goes up."
- "Does everyone understand?"
- "We going to have a practice now so you will see."
- "This is our practice round, please take note of the green bar in the top left corner that says token play, and please keep this in mind. So, remember you are the player with the thick dark circle around you."
- "So, click on a player you want to give dollars to. You will see a screen pop up. Can everyone see this screen? You will see that the pop up screen shows your balance, the other players balance and how many dollars you can play"

- "Notice if you in the poor group it says 10 and if you in the rich group it says 20. Can everyone see the increase and decrease buttons? Click increase as many times as you like. You can give all of your dollars to that player or just some to that player, if you only give some to that player you can give your remaining dollars to other out group players or either of the banks."
- "You don't need to give all your dollars to one player, you can if you like but you can give to one, two, three players or banks, you can choose how many you want to give to. You understand?"
- "Let's play this practice round"
- "Has everyone giving their dollars? Can you all see the submit button on the left? Click this once you have made your allocations."
- "Remember the rich group must give 20 dollar and the poor must give 10 dollars. Also remember you can give to either your bank or the other group's bank or other out group players. Remember the point of the game is to get rich."
- "Has everyone submitted?"
- Once everyone has submitted the review screen will appear: "The yellow screen in front of you is a summary of the giving. It a summary of who gave what. You have 30 seconds to study that screen, to see how other players acted. And the left had side panel you will also see your change; your groups change and your banks' balance. Remember the point of the game is to get rich."

5. Trial 2 (Practice trail)

- Messaging screen will appear at the beginning of Trail 2: "The screen that is in front of you now is when you can message:"
- "So how this game works is you play over a number of rounds, every second round you can chat. If you look at the top of the screen you can see a green bar that says messaging, before it was token play. Can everyone see it?"
- "That green bar will change in every second round and show messaging. When it shows messaging you have 1 minute to send a message. You can send a message to another player, your group or the other group, you can also send a message to everyone (like a broadcast)."
- "So, you have four choices.

1. “So, if you want to send a message to a certain player, you click on that player and make sure that the drop down menu on the left is on individual (remember no other player will see this message).”
2. “If you want to send a message to your group, you click on anyone in your group and make sure the drop down menu is on group (remember the other group will not be able to see this group message).”
3. “If you want to send a message to the other group, you can click on any of their players and make sure the drop down menu is on group (remember if you do this, players in your group will not see this message).”
4. “If you want to send a message to everyone, so both groups at once, you can click on any player and make sure the drop down menu is on everyone (remember now everyone can see your message).”

- “You can send as many messages as you like but please be respectful, so no swearing and hate speech. Once messages have been sent, the new messages bar on the left will be green, click on that to read the messages.”

6. Experimental Trail

- Experimental trail will begin: “You are now playing the get rich game”
- Round 1: Re-explain experimental condition and recap
- Round 2,4,6,8: Re-explain experimental condition and recap

7. Like-rating, Trust-rating and Post-test Questionnaire

- Once all 10 rounds are completed the Like-rating will appear: “Now you must please rate how much they liked each player from 1 (don't like the player at all) to 10 (like the player very much). You cannot rate yourself, once done click submit”
- Once Like-rating is completed the Trust-rating will appear: “Now you must please rate how much they trusted each player from 1 (don't trust the player at all) to 10 (trust the player very much). You cannot rate yourself, once done click submit”
- Once Trust-rating is completed the Post-test Questionnaire will appear: “The pop up menu in front of you is a questionnaire, please chick start and a Windows Explorer page will open, please fill in the questions. Once you click submit it

will say thank you, you can now close the window with the red x on the top right hand corner. Once this is closed you, can click completed."

Post-experiment Procedure

- "Thank you for completing the Get Rich game everyone"
- "Just so you know you were randomly assigned to a group, and it had nothing to do with you guesses"
- "Now, I will come around to each of you and hand out your cash incentive of R40. Please remain seated. While handing out the money, please ask me any question you like when I get to you"
- Once everyone has gotten their cash incentive "Thank you for your time everyone, please let your friends know about the experiment but please don't let them know any details, it will affect the data!"

Appendix B: Advertisement Poster

UNIVERSITY OF KWAZULU-NATAL

School of Applied Human Sciences
Discipline of Psychology

Attention all UKZN students

We are conducting a study for our Master's thesis on human behaviour and socioeconomic inequality in the P*sycLab* – UKZN Pietermaritzburg Campus.

We are looking for research participants (UKZN Students Only). Participants will be asked to play a game called: **Get Rich.**

CASH INCENTIVE FOR PARTICIPATING IN THIS STUDY:

R40.00

If you would like to participate in the study please email us (or speak to Professor Kevin Durrheim, room 36B Psychology building) and we will give you the necessary information.

Please contact Dylan or Rikshay through email on:

getrichviappl@gmail.com

or Whatsapp us on:

066 207 5194

Appendix C: Information Sheet & Consent Form

Information sheet: Get RICH VIAPPL GAME

Dear Participant,

This is a research project on human exchange behaviour and how it shapes inequality.

Brief outline of the study: This research study aims to explore the nature of the relationship between exchange behaviour and inequality. The study is electronically based game, played by up to 14 players, by giving and receiving of tokens.

What you will be required to do: The study will take place in the Psych Lab. You will be required to play a game and participate in a short group interview afterwards. This will take about 20 minutes of your time.

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

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

Research incentive: (Note to reader: this will vary depending on the manipulation). You will get between 10 Rand and 60 Rand depending on your performance.

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

- Human Social Science Research Ethics Committee:
  Ms. PhumeXimba (ximbap@ukzn.ac.za/ 031 260 3587)
- Project Leaders: School of Applied Human Sciences, University of KwaZulu-Natal:
  Professor Kevin Durrheim (Durrheim@ukzn.ac.za)
- Rikshay Ganasen (rikshay@gmail.com; 072 217 9660)
- Dylan Dennis (ddenny2107@gmail.com; 084 994 6542)

Consent form

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

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

I DO/DO NOT WISH TO RECEIVE FEEDBACK ABOUT THIS STUDY'S FINDINGS.

Student number/email address if you wish to receive feedback _____

Signature of participant:_____Date:_____

Appendix D: Demographics, Pre-test Questionnaire & Post-test Questionnaire

Demographics

1. Please indicate your age:

Type into the box

2. Please indicate your gender:
   - Male
   - Female
   - Other

3. Please indicate your race:
   - Black
   - Coloured
   - Indian
   - White
   - Other

Pre-test Questionnaire & Post-test Questionnaire

Manipulation Check

Are you in the "Green Group" or the "Purple Group"?

- Green Group
- Purple Group

Are you in the "Rich Group" or "Poor Group"?

- Rich Group
- Poor Group

Group Identification

Please answer the following questions on a 7 point scale as shown below:

- Strongly disagree
- Disagree
- Somewhat Disagree

- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

1. I identify with other members of my group
2. I feel strong ties with (purple/green) as a group
3. I am like other members of my group
4. My group is an important part of who I am

Legitimacy

Please answer the following questions on a 7 point scale as shown below:

- Strongly disagree
- Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Agree
- Strongly Agree

1. The difference between the green group and the purple group is justified and right
2. The difference between the green group and the purple group makes sense
3. The difference between the green group and purple group is the way it should be
4. The difference between my group and the other group is unfair

Social Dominance

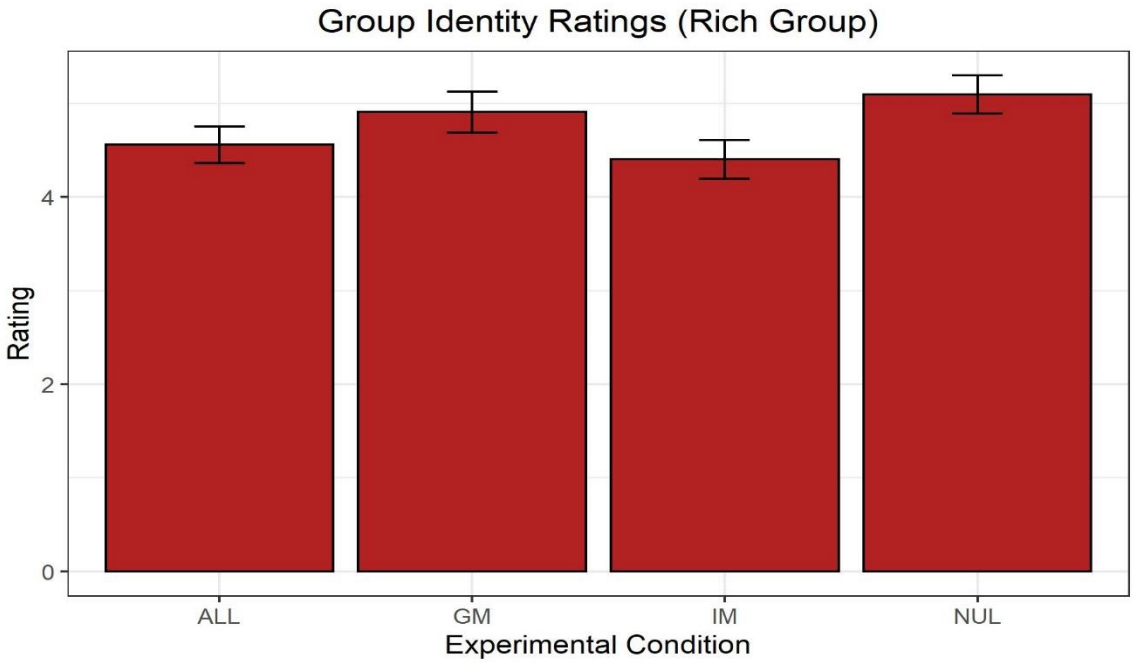
Please answer the following questions on a 5 point scale as shown below:

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly disagree

1. In setting priorities, we must consider all groups
2. We should not push for group equality
3. Group equality should be our ideal
4. Superior groups should dominate inferior groups

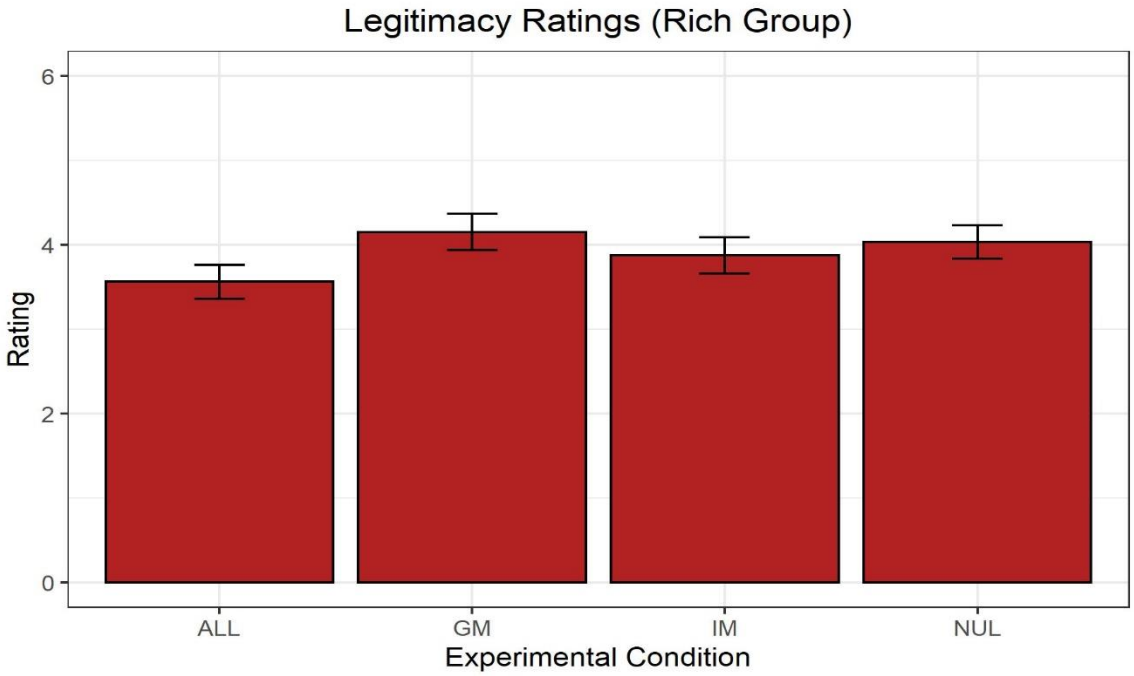
Appendix E: Group Identification, Legitimacy and Social Dominance

Rich Group: Group Identification



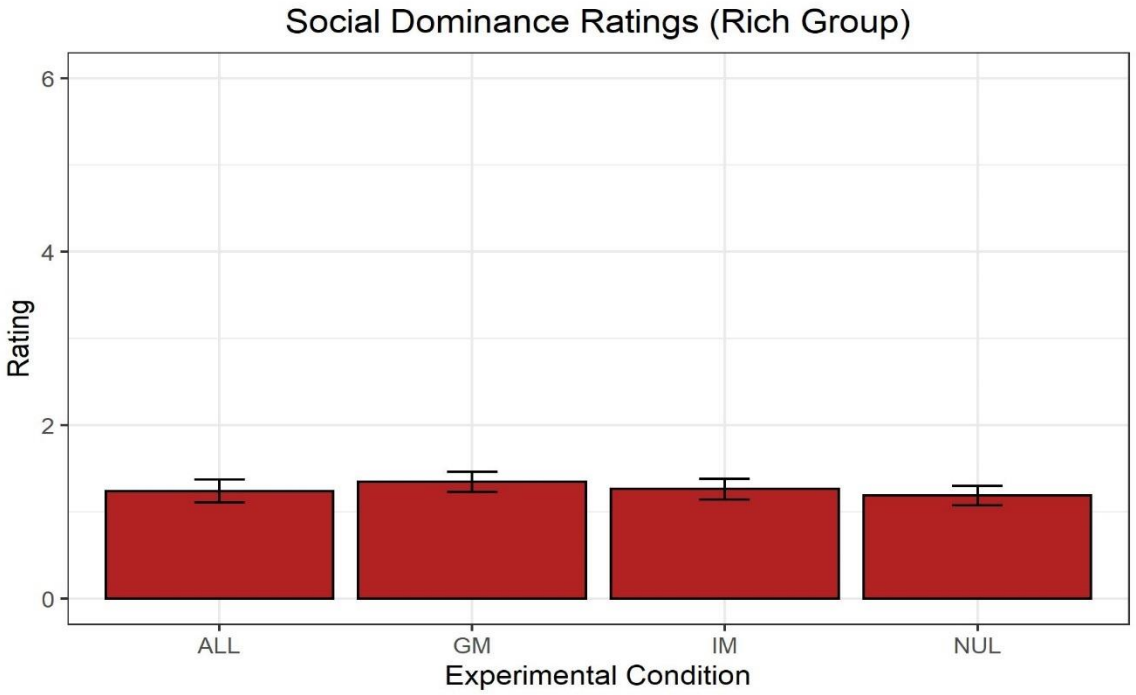
Key: ALL = Individual + Group Mobility Condition; GM = Group Mobility Condition; IM = Individual Mobility Condition; NUL = No Mobility Condition

Rich Group: Legitimacy



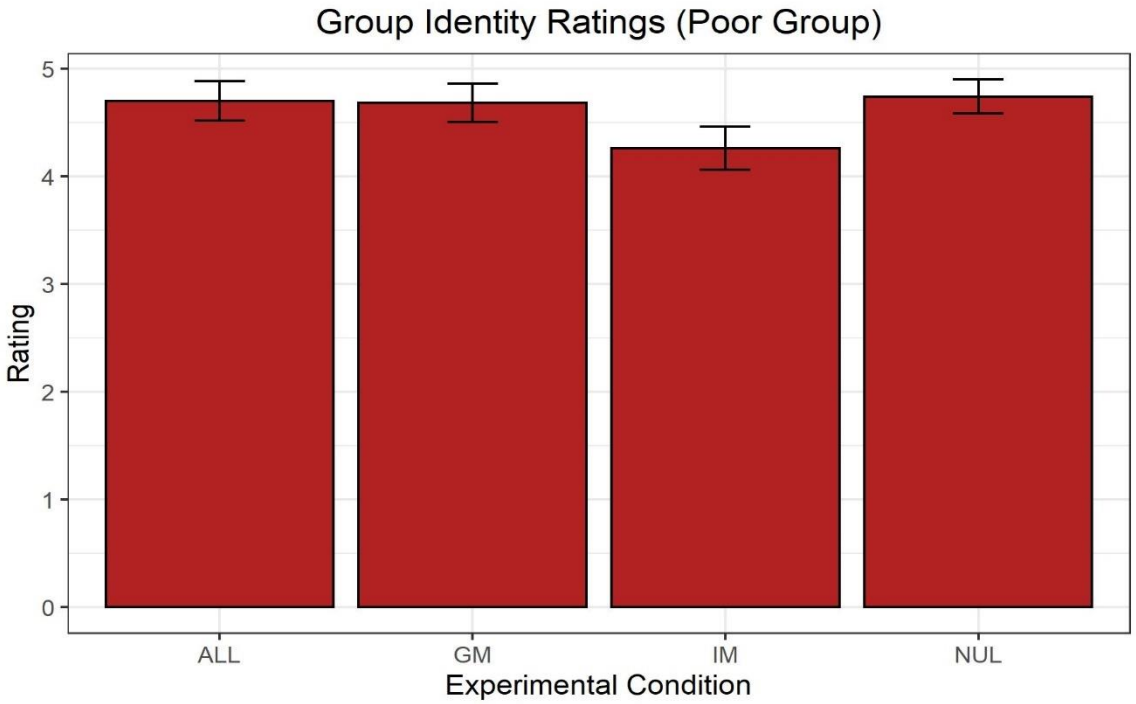
Key: ALL = Individual + Group Mobility Condition; GM = Group Mobility Condition; IM = Individual Mobility Condition; NUL = No Mobility Condition

Rich Group: Social Dominance



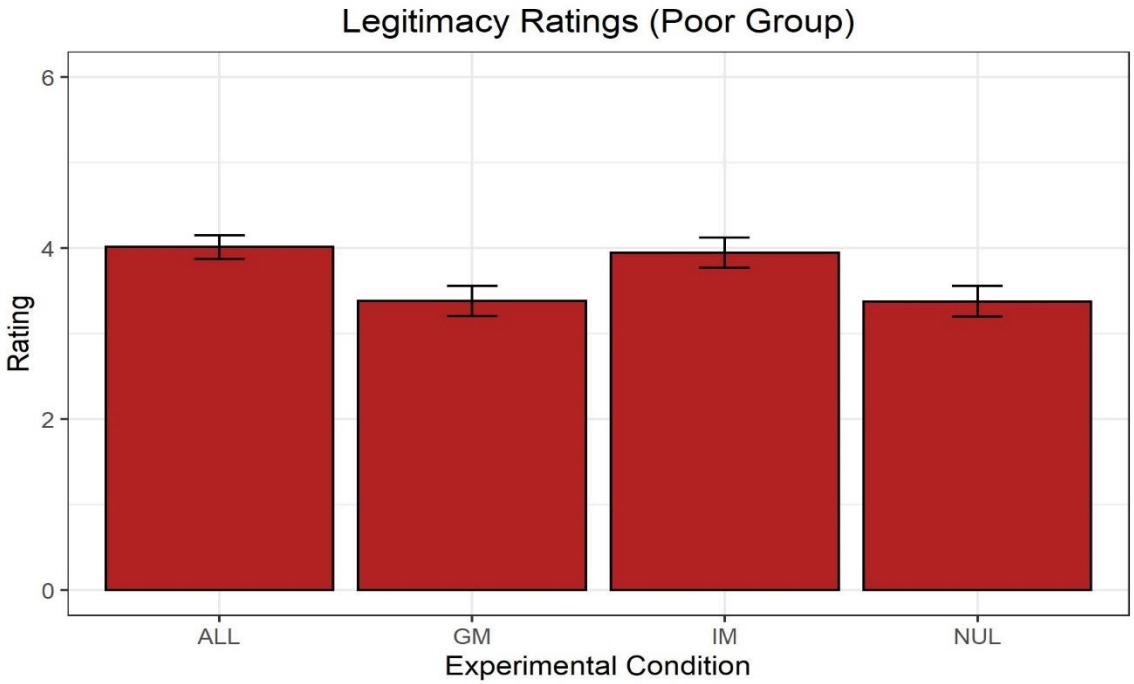
Key: ALL = Individual + Group Mobility Condition; GM = Group Mobility Condition; IM = Individual Mobility Condition; NUL = No Mobility Condition

Poor Group: Group Identification



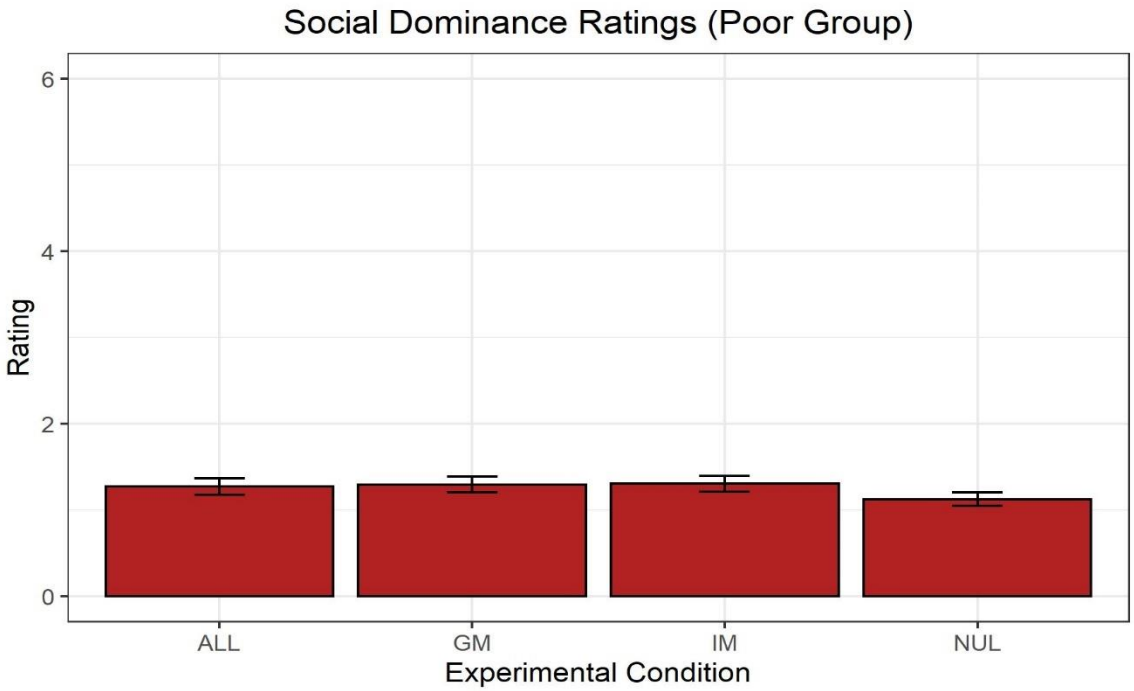
Key: ALL = Individual + Group Mobility Condition; GM = Group Mobility Condition; IM = Individual Mobility Condition; NUL = No Mobility Condition

Poor Group: Legitimacy



Key: ALL = Individual + Group Mobility Condition; GM = Group Mobility Condition; IM = Individual Mobility Condition; NUL = No Mobility Condition

Poor Group: Social Dominance



Key: ALL = Individual + Group Mobility Condition; GM = Group Mobility Condition; IM = Individual Mobility Condition; NUL = No Mobility Condition

Appendix F: Gatekeepers Permission

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

18 April 2019

Mr Dylan Dennis
School of Applied Human Sciences
College of Humanities
Pietermaritzburg Campus
UKZN
Email: ddeny2107@gmail.com Durrheim@ukzn.ac.za

Dear Mr Dennis

RE: PERMISSION TO CONDUCT RESEARCH

Gatekeeper's permission is hereby granted for you to conduct research at the University of KwaZulu-Natal (UKZN), towards your postgraduate studies, provided Ethical clearance has been obtained. We note the title of your research project is:

"Breaking the cycle of inequality in exchange networks: Strengthening in group solidarity among low status group members".

It is noted that you will be constituting your sample as follows:

- with a request for responses on the website. The questionnaire must be placed on the notice system http://notices.ukzn.ac.za. A copy of this letter (Gatekeeper's approval) must be simultaneously sent to (govenderlog@ukzn.ac.za) or (ramkissoonb@ukzn.ac.za).

Please ensure that the following appears on your questionnaire/attached to your notice:

- Ethical clearance number;
- Research title and details of the research, the researcher and the supervisor;
- Consent form is attached to the notice/questionnaire and to be signed by user before he/she fills in questionnaire;
- gatekeepers approval by the Registrar.

You are not authorized to contact staff and students using 'Microsoft Outlook' address book. Identity numbers and email addresses of individuals are not a matter of public record and are protected according to Section 14 of the South African Constitution, as well as the Protection of Public Information Act. For the release of such information over to yourself for research purposes, the University of KwaZulu-Natal will need express consent from the relevant data subjects. Data collected must be treated with due confidentiality and anonymity.

Yours sincerely

[redacted]

MR SS MOKOENA
REGISTRAR

Office of the Registrar
Postal Address: Private Bag X54001, Durban, South Africa
Telephone: +27 (0) 31 260 8005/2206 **Facsimile:** +27 (0) 31 260 7824/2204 **Email:** registrar@ukzn.ac.za
Website: www.ukzn.ac.za

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Appendix G: HSSREC Approval

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

31 October 2019

Mr Dylan Dennis (213517353)
School of Applied Human Sciences
Pietermaritzburg Campus

Dear Mr Dennis,

Protocol reference number: HSS/0449/019M
Project title: Breaking the cycle of inequality in exchange networks: Strengthening ingroup solidarity among low status group members

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 22 May 2019 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid for one year from 31 October 2019.
To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

Yours sincerely,

[redacted]

Professor Urmilla Bob
University Dean of Research

/ms

Appendix H: To Ingroup Bank Modelling

To Ingroup Bank

```
# Test for the requirement of random model terms. The result is clear. The
next step
# is to test wheter a second level, participant within game is required
m1 = gls(to_ingroupbank~ 1, data = combined2, method = "ML")
m2 = lme(to_ingroupbank ~ 1, data = combined2, method = "ML",
             random = ~ 1|game_name)
anova(m1, m2)
```

	Model <int>	df <dbl>	AIC <chr>	BIC <chr>	logLik <chr>	Test <fctr>	L.Ratio <chr>	p-value <chr>
m1	1	2	2335.452	2343.795	-1165.726			
m2	2	3	2260.521	2273.036	-1127.261	1 vs 2	76.93016	<.0001

2 rows

```
# Test to see whether a second level is required. The AIC and BIC increase
which suggests we do not require a two level model
m3 = lme(to_ingroupbank ~ 1, data = combined2, method = "ML",
             random = ~ 1|game_name/pid)
anova(m2, m3)
```

	Model <int>	df <dbl>	AIC <chr>	BIC <chr>	logLik <chr>	Test <fctr>	L.Ratio <chr>	p-value <chr>
m2	1	3	2260.521	2273.036	-1127.261			
m3	2	4	2262.521	2279.208	-1127.261	1 vs 2	9.094947e-13	1

2 rows

```
# Calculate ICC
ICC1<-lmer(to_ingroupbank ~ 1 + (1|game_name) ,
           data = combined2, REML=FALSE)
performance::icc(ICC1)
[34m# Intraclass Correlation Coefficient


[39m     Adjusted ICC: 0.289
  Conditional ICC: 0.289
```

```
# switching to lmer
## build null model first (m4) then add fixed effects (m5)
m4 = lmer(to_ingroupbank ~ 1 + (1|game_name),
          data = combined2)
m5 = lmer(to_ingroupbank ~ 1 + IM + GM + status + (1|game_name),
          data = combined2)
anova(m4, m5)
```

```
refitting model(s) with ML (instead of REML)
Data: combined2
Models:
m4: to_ingroupbank ~ 1 + (1 | game_name)
m5: to_ingroupbank ~ 1 + IM + GM + status + (1 | game_name)
   npar    AIC  BIC  logLik deviance  Chisq Df Pr(>Chisq)
m4    3 2260.5 2273 -1127.3   2254.5
m5    6 2222.0 2247 -1105.0   2210.0 44.553  3  1.151e-09 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

```
# Add interaction - we don't have solid grounds to add an interaction.
# we will report model 5
m6 = lmer(to_ingroupbank ~ 1 + IM + GM + status +
             IM*GM*status + (1|game_name),
          data = combined2)
anova(m5, m6)
```

```
refitting model(s) with ML (instead of REML)
Data: combined2
Models:
m5: to_ingroupbank ~ 1 + IM + GM + status + (1 | game_name)
m6: to_ingroupbank ~ 1 + IM + GM + status + IM * GM * status + (1 |
m6:     game_name)
   npar    AIC    BIC  logLik deviance Chisq Df Pr(>Chisq)
m5    6 2222.0 2247.0 -1105.0   2210.0
m6   10 2227.1 2268.8 -1103.6   2207.1  2.84  4     0.5849
```

```
# reporting model 5
summary(m5)
```

```
Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerMo
dLmerTest']
Formula: to_ingroupbank ~ 1 + IM + GM + status + (1 | game_name)
   Data: combined2

REML criterion at convergence: 2212.5

Scaled residuals:
     Min       1Q   Median       3Q      Max
-2.46054 -0.72101  0.02272  0.65035  2.53530

Random effects:
 Groups    Name        Variance Std.Dev.
 game_name (Intercept) 1.891    1.375
 Residual              5.004    2.237
Number of obs: 479, groups:  game_name, 60

Fixed effects:
            Estimate Std. Error       df t value Pr(>|t|)
(Intercept)   3.9026     0.3635  62.8667  10.735 7.51e-16 ***
IMNO_IM       1.3383     0.4097  57.0557   3.267  0.00184 **
GMNO_GM      -0.3854     0.4097  57.0557  -0.941  0.35074
statusrich   -1.2452     0.2113 418.1630  -5.893 7.83e-09 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:
           (Intr) IMNO_I GMNO_G
IMNO_IM    -0.564
GMNO_GM    -0.564  0.001
statusrich -0.219  0.001  0.001
```

```
anova(m5)
```

```
Type III Analysis of Variance Table with Satterthwaite's method
        Sum Sq Mean Sq NumDF  DenDF F value    Pr(>F)
IM      53.398  53.398     1  57.06 10.6715  0.001844 **
GM       4.429   4.429     1  57.06  0.8852  0.350744
status 173.751 173.751     1 418.16 34.7238 7.827e-09 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Appendix I: To Outgroup Bank Modelling

To Outgroup Bank

```
# Test for the requirement of random model terms. We don't see benifit of r
andom model terms in this analysis.
# We still have a hierarchical data structure so perhaps its best to contin
ue with a mlm?
m1.1 = gls(to_outbank ~ 1, data = combined2, method = "ML")
m2.1 = lme(to_outbank ~ 1, data = combined2, method = "ML",
             random = ~ 1|game_name)
anova(m1.1, m2.1)
```

	Model <int>	df <dbl>	AIC <chr>	BIC <chr>	logLik <chr>	Test <fctr>	L.Ratio <chr>	p-value <chr>
m1.1	1	2	1467.195	1475.538	-731.5973			
m2.1	2	3	1466.819	1479.334	-730.4093	1 vs 2	2.376085	0.1232

2 rows

```
# Calculate ICC - 0.04 This is quite low. Supports the above findings
ICC1.1<-lmer(to_outbank ~ 1 + (1|game_name) ,
           data = combined2, REML=FALSE)
performance::icc(ICC1.1)
[34m# Intraclass Correlation Coefficient


[39m     Adjusted ICC: 0.040
  Conditional ICC: 0.040
```

```
 # build null model and then another model with fixed effects
m4.1 = lmer(to_outbank ~ 1 + (1|game_name),
          data = combined2)
m5.1 = lmer(to_outbank ~ 1 + IM + GM + status + (1|game_name),
          data = combined2)
anova(m4.1, m5.1)
refitting model(s) with ML (instead of REML)
Data: combined2
Models:
m4.1: to_outbank ~ 1 + (1 | game_name)
m5.1: to_outbank ~ 1 + IM + GM + status + (1 | game_name)
```

```
     npar    AIC    BIC  logLik deviance  Chisq Df Pr(>Chisq)
m4.1    3 1466.8 1479.3 -730.41   1460.8
m5.1    6 1458.6 1483.6 -723.30   1446.6 14.217  3   0.002624 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

```
# Add interactions - once again no real support foir interactions
m6.1 = lmer(to_outbank ~ 1 + IM + GM + status +
              IM*GM*status + (1|game_name),
           data = combined2)
anova(m5.1, m6.1)
```

```
refitting model(s) with ML (instead of REML)
Data: combined2
Models:
m5.1: to_outbank ~ 1 + IM + GM + status + (1 | game_name)
m6.1: to_outbank ~ 1 + IM + GM + status + IM * GM * status + (1 | game_name
)
     npar    AIC    BIC  logLik deviance  Chisq Df Pr(>Chisq)
m5.1    6 1458.6 1483.6 -723.30   1446.6
m6.1   10 1462.1 1503.8 -721.05   1442.1 4.5037  4     0.3421
```

```
## Reporting model 5.1
summary(m5.1)
```

```
Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerMo
dLmerTest']
Formula: to_outbank ~ 1 + IM + GM + status + (1 | game_name)
   Data: combined2

REML criterion at convergence: 1458.7

Scaled residuals:
    Min      1Q  Median      3Q     Max
-1.0260 -0.6038 -0.3453  0.3160  5.7611

Random effects:
 Groups    Name        Variance Std.Dev.
 game_name (Intercept) 0.02272  0.1507
```

```
 Residual             1.18875  1.0903
Number of obs: 479, groups:  game_name, 60

Fixed effects:
             Estimate Std. Error        df t value Pr(>|t|)
(Intercept)   1.03957    0.10036  77.79776  10.358 2.68e-16 ***
IMNO_IM      -0.36769    0.10697  56.69202  -3.437  0.00111 **
GMNO_GM      -0.09144    0.10697  56.69202  -0.855  0.39621
statusrich   -0.15804    0.10298 418.02881  -1.535  0.12562
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:
           (Intr) IMNO_I GMNO_G
IMNO_IM    -0.534
GMNO_GM    -0.534  0.002
statusrich -0.386  0.003  0.003
```

```
anova(m5.1)
Type III Analysis of Variance Table with Satterthwaite's method
        Sum Sq Mean Sq NumDF  DenDF F value   Pr(>F)
IM     14.0465 14.0465     1  56.69 11.8163 0.001107 **
GM      0.8688  0.8688     1  56.69  0.7308 0.396211
status  2.7998  2.7998     1 418.03  2.3552 0.125619
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Appendix J: To Outgroup Individual Modelling

To Outgroup Individual

```
## Clear grounds for using random model terms
m1.2 = gls(to_outgroup_individual ~ 1, data = combined2, method = "ML")
m2.2 = lme(to_outgroup_individual ~ 1, data = combined2, method = "ML",
             random = ~ 1|game_name)
anova(m1.2, m2.2)
```

	Model <int>	df <dbl>	AIC <chr>	BIC <chr>	logLik <chr>	Test <fctr>	L.Ratio <chr>	p-value <chr>
m1.2	1	2	2324.179	2332.522	-1160.089			
m2.2	2	3	2260.957	2273.472	-1127.479	1 vs 2	65.22157	<.0001

2 rows

```
ICC1.2<-lmer(to_outgroup_individual ~ 1 + (1|game_name) ,
           data = combined2, REML=FALSE)
performance::icc(ICC1.2)
[34m# Intraclass Correlation Coefficient

[39m     Adjusted ICC: 0.262
  Conditional ICC: 0.262
```

```
# swtich to lmer, create null model and then add fixed effects
m4.2 = lmer(to_outgroup_individual ~ 1 + (1|game_name),
          data = combined2)
m5.2 = lmer(to_outgroup_individual ~ 1 + IM + GM + status + (1|game_name),
          data = combined2)
anova(m4.2, m5.2)
refitting model(s) with ML (instead of REML)
Data: combined2
Models:
m4.2: to_outgroup_individual ~ 1 + (1 | game_name)
m5.2: to_outgroup_individual ~ 1 + IM + GM + status + (1 | game_name)
     npar    AIC    BIC  logLik deviance  Chisq Df Pr(>Chisq)
m4.2    3 2261.0 2273.5 -1127.5   2255.0
m5.2    6 2217.7 2242.7 -1102.8   2205.7 49.275  3   1.14e-10 ***
```

```
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

```
## let's see if we have any significant interactions - sadly no
m6.2 = lmer(to_outgroup_individual ~ 1 + IM + GM + status +
              IM*GM*status + (1|game_name),
          data = combined2)
anova(m5.2, m6.2)
```

```
refitting model(s) with ML (instead of REML)
Data: combined2
Models:
m5.2: to_outgroup_individual ~ 1 + IM + GM + status + (1 | game_name)
m6.2: to_outgroup_individual ~ 1 + IM + GM + status + IM * GM * status +
m6.2:     (1 | game_name)
     npar    AIC    BIC  logLik deviance  Chisq Df Pr(>Chisq)
m5.2    6 2217.7 2242.7 -1102.8   2205.7
m6.2   10 2224.7 2266.4 -1102.4   2204.7 0.9459  4     0.9179
```

```
## reporting model 5.2
summary(m5.2)
```

```
Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerMo
dLmerTest']
Formula: to_outgroup_individual ~ 1 + IM + GM + status + (1 | game_name)
   Data: combined2

REML criterion at convergence: 2208.3

Scaled residuals:
     Min       1Q   Median       3Q      Max
-2.08671 -0.68258 -0.03788  0.63970  2.66024

Random effects:
 Groups    Name        Variance Std.Dev.
 game_name (Intercept) 1.842    1.357
 Residual              4.968    2.229
Number of obs: 479, groups:  game_name, 60
```

```
Fixed effects:
            Estimate Std. Error       df t value Pr(>|t|)
(Intercept)   5.0596     0.3598  62.9580  14.062  < 2e-16 ***
IMNO_IM      -0.9724     0.4053  57.0623  -2.399   0.0197 *
GMNO_GM       0.4751     0.4053  57.0623   1.172   0.2460
statusrich    1.4009     0.2105 418.1709   6.653 8.99e-11 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:
           (Intr) IMNO_I GMNO_G
IMNO_IM    -0.564
GMNO_GM    -0.564  0.001
statusrich -0.220  0.001  0.001
```

```
anova(m5.2)
Type III Analysis of Variance Table with Satterthwaite's method
        Sum Sq Mean Sq NumDF  DenDF F value    Pr(>F)
IM      28.588  28.588     1  57.06  5.7545   0.01974 *
GM       6.826   6.826     1  57.06  1.3741   0.24598
status 219.925 219.925     1 418.17 44.2683 8.995e-11 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```