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The impact of the MasterCard Foundation Scholarship program on social capital formation among university students: A case of the University of Pretoria, South Africa

By

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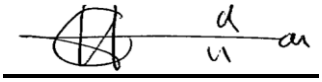
Submission Date: 15th July 2021

DECLARATION

I, Eric Muhulu Chikwalila, hereby declare that the dissertation I am submitting for the degree MSc in Agricultural Economics at the University of Pretoria is my own work and that I have not previously submitted a dissertation for a degree at this or any other tertiary institution.

Signature: 

Date: 21st May 2021

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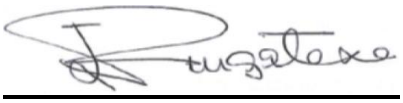
Signature: 

Date: 21st May 2021

DEDICATION

Every difficult task requires self-effort as well as the guidance of elders, especially those who are dear to our hearts. My modest effort is dedicated to my wonderful and caring mother, Doricah Ngoma. Her devotion, support, and day and night prayers helped me to achieve such success and honour. Along with all the dedicated and well-respected lecturers.

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THE IMPACT OF THE MASTERCARD FOUNDATION SCHOLARSHIP PROGRAMME ON SOCIAL CAPITAL FORMATION AMONG UNIVERSITY STUDENTS: A CASE OF THE UNIVERSITY OF PRETORIA, SOUTH AFRICA.

By

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ABSTRACT

This study determines whether the Mastercard Foundation (MCF) Scholarship Program causally influences the creation of cognitive social capital among University of Pretoria scholarship recipients, by using an online lab experiment and a post-experimental survey. Cognitive social capital, which is based on commonly shared norms among members, leads to honest and cooperative behaviour. It is necessary for information flow ease, transaction costs reduction, and allowing communities to deal with social dilemmas, which are fundamental for community development. To capture the impact of the MCF Program, the study compared MCF scholars (treated) and non-MCF scholars (controls) against levels of trust, reciprocity, altruism, cooperation, in-group favouritism and out-group discrimination. The results show that the Program has no statistically significant impact on levels of trust (MW p=0.3504), reciprocity (MW p=0.1688), altruism (MW p=0.8963), and cooperation (MW p=0.6503). The Program, however, has had statistically significant impact on levels of in-group favouritism and out-group discrimination. The post-experimental survey showed that MCF and non-MCF subjects were similar in terms of stated pro-social behaviour perceptions, and in-group social capital creation. In my study, we found that self-selection is not a significant source of bias because we sampled around 78% of the MCF population. We had 102 of approximately 130 MCF scholars on the scholarship at the time. I recommend that the Program should invest in greater education of its scholars on the importance of cooperation, altruism, social responsibility, trust, and trustworthiness to boost cognitive social capital formation.

Keywords: Cognitive social capital, Mastercard Foundation Scholarship, Dictator game, Trust game, Public Goods game, Bomb Risk Elicitation Task.

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ACRONYMS

CCT	Conditional Cash Transfer
CDD	Community Driven Development
MCF	Mastercard Foundation
IMAGE	Intervention with Microfinance for AIDS and Gender Equity
HIV	Human Immunodeficiency Virus
BRET	Bomb Risk Elicitation Task
VCM	Voluntary Contribution Mechanism
MW	Mann-Whitney / Rank sum test
LDC	Least Developed Countries
OLS	Ordinary Least Squares

CHAPTER 1: INTRODUCTION

1.1 Background to the study

This study uses an online lab experiment to determine whether the MasterCard Foundation (MCF) Program, a scholarship program that has continuously been in operation at the University of Pretoria since 2013, has increased the level of cognitive social capital among participants. Social capital is described by Putnam (1995, p. 176) as "features of social organization such as norms, networks and social trust that facilitate coordination and cooperation for mutual benefit". Social capital involves networks between persons and the acts of trustworthy and reciprocity that result from them (Putnam, 2000). Stone and Hughes (2002) argued that social capital involves interactions between individuals or players in economic, social, and political activities. If people can trust one another, they are more likely to engage in contracts with each other or work together towards resolving common problems that affect their community. Social capital has also been described as collective action enhanced by trust and norms among community members (Bowles and Gintis, 2002; Woolcock and Narayan, 2000). I focus on the definition formulated by Fukuyama (1995, p. 26) who describes trust as "the expectation that arises within a community of regular, honest and cooperative behaviour based on commonly shared norms on the part of other members of that society". Social norms impact on the preferences of individuals, reduce costs associated with transactions, ease the flow of information, and allow communities to succeed in dealing with social dilemmas. 'Cognitive social capital' is a term used to describe this type of social capital (Van Rijn et al., 2012).

In recent years, research has focused more on the impact of social capital on economic activity and growth. A country's economic activity has been described to be influenced by the level of social capital among its population (Isham, 2002; Maluccio et al., 2000; Van Rijn et al., 2012; Wossen et al., 2015). According to research, there is a positive relationship between economic development and social capital, as well as health (Coleman, 1988; Knack and Keefer, 1997; Woolcock and Narayan, 2000; Hawe and Shiell, 2000). While there are no exact definitions for social capital, it is generally accepted that it is an important component in the functioning of societies (Onyx and Leonard, 2010). Consequently, policymakers have made significant endeavours in raising social capital by engaging in interventions to this end, at multiple scales with different stakeholders. Some of the interventions are meant to enhance the livelihoods of

economically disadvantaged people; for instance, the Community Driven Development (CDD) program in Sudan (Avdeenko and Gilligan, 2015); the community led total sanitation program in Mozambique (Mosler et al., 2018); various comprehensive rural development projects in Zimbabwe (Zuwarimwe and Kirsten, 2010); the CDD project on social fund-social recovery project in Zambia and Malawi (Vajja and White, 2008); analysis of the IMAGE project on HIV in rural South Africa (Pronyk et al., 2008); and a conditional cash transfer and cooperation project in South Africa (Attanasio et al., 2015). These interventions helped to build values, norms, trust, and coordination among people in communities. The civic culture of the participants is enhanced by participating in activities under the interventions.

Although there is empirical evidence on the importance of international intervention for societies, there is little evidence on the impact of these initiatives on social capital, to date. The evaluations of the Philippines' KALAHI-CIDSS, Zambia's Social Recovery Project II, and Armenia's Social Investment Fund have yielded mixed results on social capital. The Sierra Leone GoBiFo project, Indonesia's KDP-BRA and Urban Poverty Program II, the Nepal Poverty Alleviation Fund project, and the Afghanistan National Solidarity Program II yielded no results on social capital (Wong, 2012).

Evidence on the social capital spillover effects of these projects is scant. Wong (2012) concludes that these projects had no effect on social capital, although they did improve public service delivery. There is need to examine social capital, over time, and its impact to better and clearly understand the pathways that lead to reforms in communities (Wong, 2012). Humphreys et al. (2012) conducted a randomised study on a Tuungane project in eastern Democratic Republic of Congo. The project was aimed at improving the welfare and strengthening of the local cohesion and local governance capacity in war-affected villages. The Tuungane project organised elections for village leaders, leadership training, and training on good governance and social inclusion. Using survey responses to trust questions and pro-social behaviours, they report no significant treatment effect on local governance and social cohesion between project participants and control. Using lab in the field studies, Avdeenko and Gilligan (2015) tested a community-driven project in Sudan to see if it could change the grassroots civic culture to increase social capital. The project was aimed at addressing the impacts of the civil war on the economy, social cohesion, and destruction of public infrastructure. They found that the program had no effect on the dense social networks and on the pro-social preferences of the recipients in the project area. Studies evaluating community-driven projects have reported

that these programs have helped to improve on local public service delivery. However, most of the studies have failed to find the causal impact of these programs on collective action of communities and public goods provision. What is not clear about the detachment of these CDD projects and their capacity to provide public service delivery is whether the public service delivery was pushed by the local leaders, preventing greater pro-sociality of community members, or whether local leaders were willing to change, but the community members had a free rider problem and evaded the opportunities for greater participation (Avdeenko and Gilligan, 2015).

Although not community-based, the Mastercard Foundation (MCF) Program is an intervention with some similarities to those community programmes. The MCF, which has been running since 2013 at the University of Pretoria, offers scholarship programmes to academically talented, yet economically disadvantaged, young African people. The goal is to offer funding to students with the potential to help transform the African continent and the world at large through their skills, attitudes and values that will be evidenced by their leadership abilities (Mastercard Foundation, 2020).

The scholarships offer young people an opportunity to complete their secondary and university education and make successful transitions to further education or careers at partner universities (Mastercard Foundation, 2020). The Program aims at building capacity among future leaders and thus offers comprehensive support to scholars through learning opportunities that help them to make positive impacts in their communities through equipping them with skills, knowledge, and values. It is a comprehensive scholarship and offers academic support, mentoring and counselling, and experiential learning through internship and social entrepreneurship, as well as offering advice on writing a curriculum vitae and on interview skills for applying for jobs in the scholar's respective countries. Another important principle is that members of the Program should exhibit 'Give Back' (Mastercard Foundation, 2020). This principle is put in place once scholars return to their home countries, where they are encouraged to give back to their communities what they have learned and benefited from during the Program.

The scholars are encouraged to take part in a variety of voluntary engagements, which then helps to build an MCF community. There are four main activities: organising events for the scholarship students, such as outings, special holidays like Heritage Day, and braais (barbeques); joining a media team that serves the scholars' community through Mastercard

web design, editorial work, video recording and photographs in all Mastercard activities; participating in outreach activities outside the university campus, such as visiting orphanages, feeding the poor and fundraising through hiking; and participating in the academics team that offers support on all academic-related problems, such as voluntary tutoring, mentoring, and coping with any other challenges that scholars might face in their studies. All these activities are meant to equip the scholars participating in the Program for dealing with life after the Scholarship Program.

These activities are meant to mould these young scholars into leaders that will help in transforming their communities. The Program expects participants to be actively involved in their communities, have appreciation for the values and beliefs of others, and have keen interest in participating in different activities in their communities. Although I hypothesise that the Program positively affects the level of cognitive social capital among participants, no evaluation has been undertaken to prove this. My study aims at measuring cognitive social capital among the students who participate in the Program and comparing it with the cognitive social capital of non-Program students. I add to existing knowledge on factors affecting social capital build-up by using an online lab experiment that will evaluate whether MCF Scholarship participants behave more pro-socially than other students who are not on the Scholarship Program. I also investigate whether MCF and non-MCF groups have any levels of in-group favouritism or out-group discrimination.

I define social capital as comprising higher levels of trust and trustworthiness toward members of own group, greater altruism toward members of own group, and higher contributions to public goods, especially where these contributions accrue to members of the community, as defined by Fukuyama (1995), Putnam (2000), and Van Rijn et al. (2012). My aim is to determine through the online experiment whether higher levels of cognitive social capital are seen among MCF participants, relative to a control group of non-MCF students in similar degree programmes at UP.

I will move towards using two different but complementary methods. Firstly, the online lab experiment helps us to analyse the effects of the Scholarship Program in terms of promoting pro-social preferences for the scholars who participate in it. Secondly, I survey the social networks that have been established by the MCF Scholarship participants. The survey on networks allows us to identify the scholars' participation in activities that the Scholarship offers.

To determine social capital in a society, it is critical to analyse the social networks that exist in a community (Putnam et al., 1994). To achieve my objectives, I will use two strategies of data collection. Firstly, to determine and ascertain the social networks, I used the responses recorded in the post-experiment questionnaire that was made available at the end of the experiments and which included questions about the participants' stated preferences and solidarity within their group. The study measured the social preferences that are important for the functioning of communities, but which are not fully sufficient, as citizens also need to have relationships with their neighbours. My study measured some pro-social attributes, namely trust, altruism, reciprocity, and cooperativeness, which are the pre-conditions for social capital creation (Attanasio et al. 2015; Avdeenko and Gilligan, 2015; Bashar et al., 2019). Attitude towards risk will be analysed in this study, as it is cardinal to monitor the degree of self-assurance and pro-action towards challenging initiative by the participants to the Program. These attributes will be measured among MCF Scholarship participants and compared with those of non-participants.

Second, I determined pro-social attributes and risk attitudes by using experiments that assessed altruism (determined by the Rands sent in the Dictator game), trust and reciprocity (determined by the Rands sent and returned in the Trust game), cooperation (determined by the Rands contributed to a Public Goods game), and risk attitudes (determined by the number of cells opened in the Bomb Risk Elicitation Task).

I used these two strategies to answer my objectives because the experimental games provide a better reflection of the pro-social attributes of the participants than the post-experimental questionnaire does. My study is one of a few studies that have run different experiments in determining the pro-social attributes among the participants (Attanasio et al. 2015; Baldassarri and Grossman, 2013; Falk et al., 2013; Labonne and Chase, 2011).

I anticipate that the MCF community would have more social capital than the non-MCF group has. I expect the MCF scholars to behave more pro-socially than the non-participants do. In addition, I expect MCF participants to experience a positive social networking, as opposed to the non-participants, by having a larger number of reported connections. The MCF group will exhibit greater social cohesiveness than non-participants will by having more people they trust and interact with. I expect this because members of the MCF Scholarship receive coaching on the importance of civic participation, while those in the control do not receive coaching.

1.2 Problem Statement

Since 2013, the Mastercard Foundation Scholarship has been engaging scholars to participate in various activities that include tutoring, mentorship, editorial work, community engagement, and leadership coaching. These activities have been anticipated to enhance social capital, which is characterised as "connections among individuals-social networks and the norms of reciprocity and trustworthiness that arise from them" (Putnam, 2000, p.16). The social networks are important for communities to be able to function well (McMichael and Manderson, 2004).

According to Putnam (2000) and Putnam et al. (1994), determining dense social networks is essential for the development of social capital. Although the MCF has been in place since 2013, its ability to promote social networks and trust among scholars through its activities has not been evaluated. The level of social capital build-up is less understood. The purpose of this study is to fill the knowledge gap. II assume that the Program aims at helping scholars to build networks, acquaintances, norms, and civic attachment that they need for effective participation in community affairs. The social ties that are built promote social attitudes such as trust, attitudes towards risk, reciprocity, cooperativeness, and altruism that help in dealing with community problems that scholars might face as they execute their responsibilities in their communities. These social virtues promote social capital. This study aims at evaluating the impact of the MCF Scholarship Program on building social capital among participants.

1.3 General objectives

The general objectives aim at assessing the level of social capital that is built up through the MCF Scholarship Program among students receiving the Scholarship.

1.3.1 Specific objectives

The specific objectives are:

a. to determine the effect of the MCF Program on the level of trust among the members of the treatment group and of the control group;

b. to determine the effect of the MCF Program on the attitudes towards risk among the members of the treatment group and of the control group;

c. to determine effect of the MCF Program on the level of altruism among the members of the two groups;

d. to determine effect of the MCF Program on the level of reciprocity among the members of the two groups;

e. to determine effect of the MCF Program on the level of cooperativeness among the members of the two groups; and

f. to determine the effect of the MCF Program on the social networks among the members of the two groups.

1.4 Statement of study hypotheses

There are two hypotheses that will be tested in my study to answerr the above objectives. I justify these hypotheses from what other international interventions found regarding my objectives. These are explained below:

Hypothesis 1: *Pro-social behaviour is more evident in the MCF group than in the non-MCF group.*

Developmental programmes help in promoting positive pro-social behaviour (which is a fundamental aspect of social capital) among target communities. They endeavour to rebuild communities, restore trust at local level, and rebuild social relationships. Casey et al. (2012) and Fearon et al. (2009) have reported that these programmes also aim at building public infrastructure by engaging the local community to participate, plan and monitor these projects.

Other studies on developmental programmes have identified improvements in the monitoring by citizens of existing public services, which resulted from improved collective action in monitoring and reporting on public service delivery in order to reduce corruption during the management of these programmes (Björkman and Svensson, 2009; Banerjee et al., 2010). I find that in all these studies, pro-sociality was an important aspect for the success of the project. In this regard, I hypothesise that the Mastercard Foundation Scholarship Program influences the pro-social behaviour of its scholars.

Hypothesis 2: *The positive effects of the MCF Program on pro-social behaviour are visible also when MCF subjects relate with other non-MCF subjects.*

Social interactions affect behaviours in most groups. Several studies have shown that being a member of a certain group has a significant impact on human behaviour (Goette et al., 2006; Eckel and Grossman, 2005; Bernhard et al., 2006). Group identity has been reported to influence trust concerns, altruism, cooperation, and reciprocity concerns among community

members (Bernhard et al., 2006; Goette et al., 2006; Guala et al., 2013). Studies have shown the existence of in-group favouritism and out-group discrimination among groups that were well established in communities (Abbink and Harris, 2019; Falk and Zehnder, 2007; Grimm et al., 2017). Members of one group discriminated against members of another group because the other group either was opposed to their views or was a well-established group in the community carrying out certain activities.

I hypothesise that the promotion of pro-sociality among MCF group members will have spillover effects outside the MCF group. I do not expect MCF Scholars to discriminate against the other group, as they have developed a pro-social behaviour from participating in the Program. I do not expect actions of in-group favouritism or out-group discrimination by MCF Scholars in the test games, as the other group is not well established and existed because of experimental labelling.

1.5 Conceptual framework

Social capital is described by Ostrom (2000, p. 176) as "shared knowledge, understandings, norms, rules and expectations about patterns of interactions that groups of individuals bring to a recurrent activity". Since the MCF Program exposes its scholars in participating in different activities. Scholars become exposed to different norms, knowledge, understandings, and expectations about behavioural patterns of different people. Through these interactions scholars become exposed to new networks both within the group (MCF community) and outside the group (non-MCF community). With this exposure, there social, economic, and cultural standing of these scholars is affected as they meet different people who have different economic, social, and cultural behaviours. And since these scholars are being mounded to become good leaders in their communities, they need to understand the norms, social trust and networks for these scholars to Give Back successfully in their communities.

According to Palmer and Gasman (2008), social capital is a term that refers to the wealth that can be gained by becoming a member of a community. Social capital is a resource that can be obtained from society through understanding that society, gaining achievements, or through developing formal and informal connections and relationships (Brown and Davis, 2001).

Building on the dominant definitions of social capital, I propose the following framework. The variables of interest that are required to influence the degree of social capital are clarified through the conceptual framework described below. The framework explains how the variables

determine the degree of social capital. It paints a clear picture of how the amounts sent and returned in the Trust game, as well as the amounts sent in the Dictator game and the amounts contributed to public goods, influence the degree of social capital.

The framework demonstrates that pro-sociality behaviour in the four games is a significant parameter in determining the extent of social capital. The higher the degree of altruism, trust and trustworthiness, and solidarity in a community, the higher the amounts donated to the poor in the Dictator game, the amounts sent and returned in the Trust game, and the amounts contributed to a public good. The group has a higher level of social capital based on these indicators. These indicators are affected by the MCF scholars interacting regularly, honestly and exhibiting cooperative behaviour while they engage in different activities that the program offers within and outside their scholars community. Institutions must be in place so that common set laws are adhered to.

Widner and Mundt (1998) state that if people can trust each other, having different backgrounds, trust the next person, and share different norms that support different ideologies, then there is a likelihood of achieving good governance and economic development. Carter and Castillo (2011) report that the social capital of trust could enable individuals in less-developed countries to make a living. If people have a solid social capital base, they will take care of one another and the spirit of ubuntu[1] will be uplifted. Social capital could help to bring down mortality rates, bring about child and mental health improvements, and contribute to the lowering of the levels of sexually transmitted diseases and of the levels of crime among a nation's citizens (Pronyk et al., 2008). If the citizens of a nation are in such an environment, there will be great coordination and cooperation towards achieving national development.

Through social capital, individuals are granted social rewards that include status, opportunities, and positions in formal and informal organisations and institutions because of good social networking (Brown and Davis, 2001). Because people would be in good health, I expect them to be productive in these sectors. Since community well-being is achieved, good leaders will be at its core and there will be good governance. If this is achieved, scarce resources will be allocated efficiently, and economic development will be achieved.

[1] The capacity in African culture to express compassion, reciprocity, dignity, harmony and humanity in the interests of building and maintaining community with justice and mutual caring.

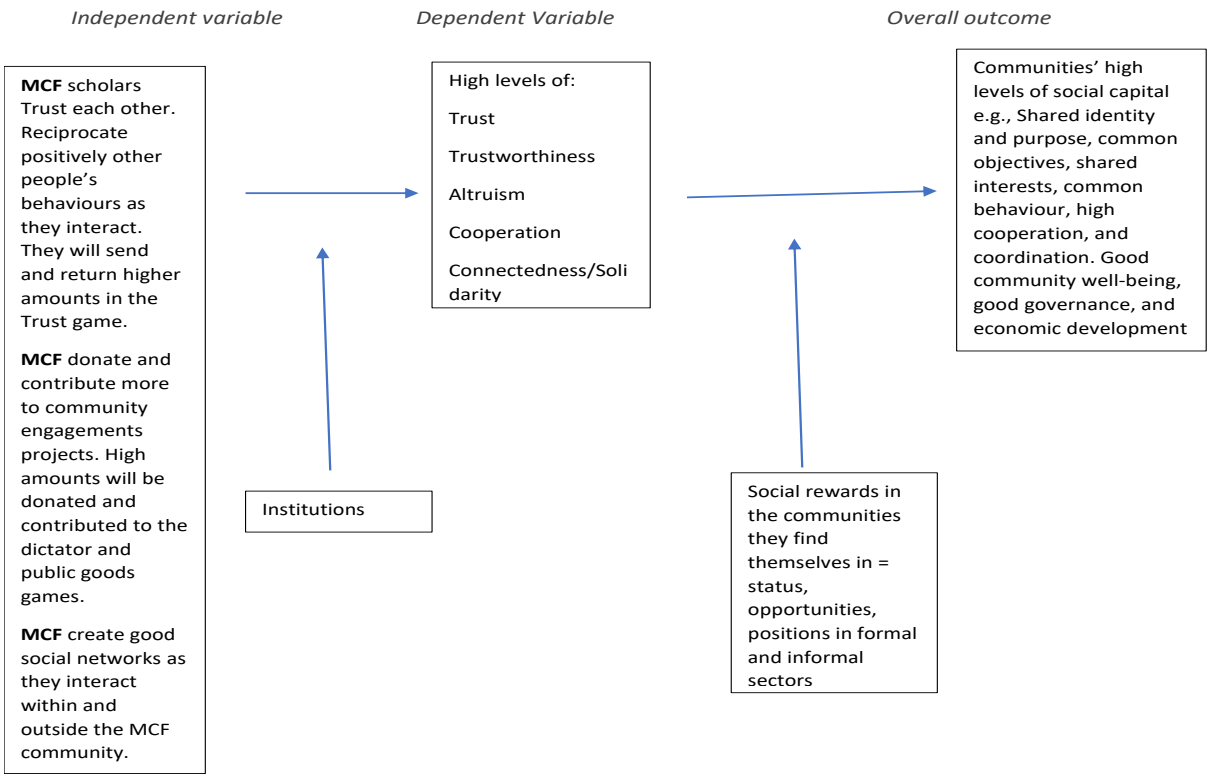


Figure 1.1: Study's conceptual framework

Source: Author's analysis

CHAPTER 2: REVIEW OF LITERATURE

2.1 Social capital

Social capital has attracted much attention in many disciplines as it is seen to be important in developing rural areas. It can improve economic outcomes when appropriate changes occur in the social structures of communities (Attanasio et al., 2015). “Social capital can allude to the arrangement of resources intrinsic to the connections and structures in the communities (Uphoff, 2000).” Social capital manifests in patterns of pro-social behaviour or pro-social preferences such as cooperation, reciprocity, and trust (Christoforou and Davis, 2014). Individual benefits can be obtained through these patterns of social behaviour and by being a member of networks and social structures (Portes, 1998). Social capital establishes norms necessary for individuals to work together in several groups; consequently, it is an outcome of social habits that are well established (Fukuyama, 2004). It has therefore been characterised distinctively in various social settings. Social capital has been described as comprising cognitive, bridging, structural, bonding and linking facets of social capital.

2.1.1 Bridging, Bonding, and linking social capital

In a society, there are two types of social capital: bridging and bonding social capital (Michelini, 2013). The latter is characterised as comprising relationships between people who share similar characteristics and are compelled to collaborate or support one another in times of need (Woolcock and Narayan, 2000). These provide community members with a feeling of belonging, purpose, and collective action. The more these ties are upheld, the stronger the bonds become within the community. Bonding social capital examples include clubs, groups and any connectedness that results from communities being involved in agriculture. The groupings can also arise because of people meeting for worship or participating in traditional organisations. The presence of trust and norms in a society represents this form of social capital.

If the bonds become stronger within one community at the expense of connections with other communities, then that community is likely to be independent, and less trade between the communities will occur. To avoid this, social capital is needed to be built between communities. There is a need for most communities to cultivate social capital between communities (Michelini, 2013). Bridging social capital will then enable members of one community to gain access to resources that cannot be offered by the community in which they live. It helps in linking networks between communities, which networks are much needed for

coordination and cooperation to attain set objectives. It is a type of social capital that promotes stringent levels of trustworthiness, distinct trust levels, and greater involvement in the welfare of other communities. Bridging social capital allows participants in one community to gain an understanding as to why other communities are prospering. Bonding social capital is an important component of a community's fight against poverty, and bridging social capital is important for a nation's economic growth (Woolcock and Narayan, 2000). Without the presence of a higher authority that can influence their activities, these two types of social capital are insufficient.

Linking social capital is another form of social capital that connects communities and those in positions of power. Njuki et al. (2008, p. 2) define it as "the engagement of local groups or networks with institutions or agencies in higher influential positions". Communities may gain access to the information and resources that they need for economic growth by using linking social capital.

2.1.2 Cognitive and structural social capital

Uphoff (2000) defines social capital in two distinct ways. He reports that social capital has two forms, and these constitute structural and cognitive forms. Precedents, functions, laws, procedures, and networks that allow for the implementation of administrative, collective action, and cooperative processes are referred to as structural social capital (Uphoff, 2000). He defines cognitive social capital as "values, attitudes, beliefs and norms that predispose people to cooperate".

In societies, both cognitive and structural social capital are critical because the latter helps members to cooperate and build trust. The latter allows a firm belief in reliability and unity among members having a mutual interest or support with a group. This study will therefore look at how these forms of social capital exist among the Mastercard Foundation Scholars.

Coleman (1988) reports that there are three components at the core of social capital, and these are coordination, networks, and cooperation. A social network and coordination decide the adequacy of the social norms, as coordination balances the inequalities that might exist among groups and helps groups to achieve group goals, while a social network will facilitate the sharing of information between groups, and this will encourage cooperation within the group. Another factor at the core of social capital is its capability for overcoming free riding in real life affairs in communities (Coleman, 1988). Free riding is often seen in poor communities,

especially regarding public goods provision, when cooperative behaviours are expected from individuals (Coleman, 1990).

The need to establish cooperation and cooperative behaviours among communities is an important aspect for many developing nations where the institutions in place are weak and the rule of law is not adhered to sufficiently (Polania-Reyes, 2015). It is important to establish coordination as it brings solutions to collective-action-related problems and it will further help to control market failures that hinder economic development. Given the significance of social capital for improvement and development, there has been a resonance between several studies that have noted its importance in economic development (Christoforou and Davis, 2014; Fukuyama, 2001; Fukuyama, 2004; Guiso et al., 2004; Woolcock and Narayan, 2000). However, social capital is still a difficult notion to encompass (Brunie, 2009; Adler and Kwon, 2002). There is a need to determine the different facets of social capital as debate still swirls around the justification of the methods used to measure it in surveys (Portes and Landolt, 2000; Putnam, 2001; Kawachi et al., 2008).

As an alternative to survey measures, incentivised choice experiments have been used to measure the behaviour of individuals. This is because incentivised choice experiments are generally considered a gold standard (Rustagi et al., 2010; Sutter et al., 2013). They offer more accurate predictions of real-life behaviours than survey measures do. Survey measures may not reliably predict real-life choices (Bauer et al., 2020). This is because they are subject to experimental demand effects, as they report what the respondent believes the experimenter wants to hear. These experiments have been carried out in the field to study the pro-social attributes that are needed to determine social capital in both rural and urban areas.

2.2 Evidence on Social capital literature

In Africa and around the world, empirical research has been conducted that analyses the concept of social capital. Governments and non-governmental organisations both regard social capital as a critical component of economic growth. This demonstrates the need for further research into the factors that influence social capital. Social capital is divided into three dimensions by Van Rijn et al. (2012): cognitive, bonding, and bridging social capital. The researchers used a novel data set that included seven African countries in sub-Saharan Africa. The authors also discovered a negative connection between agricultural technology adoption

and cognitive social capital, based on intra-community norms of cooperation and trust, as well as their innovation index.

In Ethiopia, Wossen et al. (2015) investigated the impact of various dimensions of social capital, risk preference, and adoption of improved farmland management practices. They used cross-section and panel data to conclude that social capital plays an important role in promoting the adoption of better farmland management. The authors found no differences in the impact of social capital on households with various risk behaviours.

Isham (2002) investigated how social capital influences the adoption of agricultural technology in Tanzania. He used a probit model to assess the probability of fertiliser adoption through social affiliations in 87 Tanzanian rural villages. Isham builds on Feder and Slade's (1984) model of technology adoption to see whether group uniformity, participation norms, and diverse leadership would enable farmers to use fertiliser. He concludes that strong social affiliations in communities are essential for farmers' adoption of new technologies, and that the level of involvement in social affiliations should be determined before a new technology is introduced to them.

The desire of farmers to improve their livelihoods drives their participation in social affiliations (Isham, 2002). Participation levels influence how patient these farmers are and how risky their actions are (Isham, 2002). According to research carried out by Isham (2002), Van Rijn et al. (2012), and Wossen et al. (2015), it is crucial to first develop social networks among communities in order for new agriculture technologies to be implemented successfully. Social capital is beneficial not only to the rural poor, but also to the urban poor in LDCs, which are typically excluded from such studies. As a result, researchers like Bashar and Bramley (2019) have focused on the development of social capital and cooperation among the urban poor in LDCs. The authors mainly focused on two levels of cooperation: individual and community cooperation. Focusing on 1800 households in Bangladesh, they used Durlauf's approach to assessing social capital and Manski's[2] perspective on social interaction. They conclude that a household's socioeconomic status can decide the degree of group cooperation. They further conclude that poor people who live in the same neighbourhood are more likely to trust each

[2] Manski's point of view on social interaction is based on the concept of an agent as a decisionmaker carries within it a straightforward answer to the question of how agents interact. Agents interact through their chosen actions. An action chosen by one agent may affect the actions of other agents through three channels: constraints, expectations, and preferences.

other and collaborate with one another. In attempting to understand the social capital problem, these studies did not use experimental approaches.

Other studies have used experimental economics to investigate the various aspects of social capital, and some have conducted experiments to investigate specific aspects like trust, cooperation, and risk. These studies have shown the value of experimental economics in addressing the social capital issue. Karlan (2005) used experimental economics to see whether social capital would help people to predict their financial decisions. To see whether game results could predict financial decisions, researchers used Public Goods games (Ledyard et al., 1995) and Trust games (Berg et al., 1995). Trust games assess both trust (sender decisions) and reciprocity (receiver decisions). Karlan (2005) concludes that the Trust game can be used to forecast loan repayments by using social pressure, and that experimental economics is a useful method for field experiments.

In Uganda, a lab in the field experiment was carried out to see whether impatient farmers exhibited risk aversion (Clot et al., 2017). The authors investigated the relationship between risk and time preference among farmers participating in an environmental conservation programme by using a simplified version of the convex time budget process. They found a negative correlation between risk and time preferences. Farmers who are impatient take more risks than farmers who are cautious do.

In Thailand, Cassar et al. (2017) investigated the effect of natural disasters on people's risk, trust, and time preferences. They carried out a series of surveys to see how the 2004 Tsunami affected people's preferences. They used the investment game devised by Berg et al. (1995) to evoke trust and the multiple price list devised by Holt and Laury (2002) to measure risk aversion. They discovered that the disaster resulted in high levels of risk tolerance, social acceptance, and behaviour that promote friendship. This demonstrates how people's tastes are influenced by events and circumstances.

The body of knowledge on how international intervention programmes affect social capital is expanding. Social capital has been affected differently by these programmes. Polania-Reyes (2015) used artefactual field experiments to disentangle social capital on the conditional cash transfer scheme. Researchers used a simple coordination game to separate cooperation from coordination and rated the Pareto equilibria. The Public Goods game (Karlan, 2005) was used to assess the participants' levels of cooperation. The structural choice model was used to

estimate the individual's coordination choices, and it highlighted the individual's assumptions about the behaviour of other participants. They discovered that the conditional cash transfer programme had a significant effect on programme participants' coordination success. However, Avdeenko and Gilligan (2015), on the other hand, found no evidence that the community-driven development project had any significant effect on social capital when assessing its impact. They used a lab in the field experiment to assess the scope of the project's social networks in Sudan. They played four games to assess the participants' willingness to share with others in need and contribute to a public good, as well as their level of trust and reciprocity. In the lab, neither the treatment nor the control groups acted more pro-socially. Members of the control group were more active in neighbourhood networks than those in the treatment group were. As a result, the project had only a slight impact on the growth of social capital among Sudanese community members. Similarly, Mansuri and Rao (2012) and Wong (2012) found a negative correlation between the formation of social networks and collective action.

Labonne and Chase (2011) assessed a community-driven project that began in 2003 and included 2100 households. To determine the project's results, they used propensity score matching and difference in differences approaches. They found that the project increased participants' trust in strangers and increased their attendance at community meetings. Conversely, in the village, involvement in other informal events by village members reduced. This demonstrates the fact that the project crowded out other community events.

In Sierra Leone, Casey et al. (2012) evaluated a World Bank-sponsored programme aimed at improving local institutions. They found a positive effect on communities' short-term provision of public goods, but no effects on collective action, decision-making, or women's involvement in village affairs. This shows that the project failed to improve local institutions. As can be seen, these policies have a detrimental impact on the formation of social networks within societies. This raises the question of whether these programmes can affect pro-social behaviour and expand social networks that could assist in the promotion of such programmes.

2.3 Social capital in southern Africa

The subject of social capital in Southern Africa has been discussed in previous research papers. In KwaZulu-Natal, Maluccio et al. (2000) investigated the effect of social capital on both informal and formal communities. The authors estimated per capita spending and social capital by using a panel collection of data. After adjusting for fixed effects and endogeneity, the

authors found that social capital had no impact on household welfare in 1993, but had a positive effect in 1998.

Burns (2006), on the other hand, focused on racial stereotypes and trust, finding that black participants were less trusting and trustworthy towards other black participants, which was an unexpected result that defies assumptions in social psychology literature about in-group favouritism. This behaviour, on the other hand, is consistent with black students' self-reported low levels of interpersonal and community trust.

The effectiveness of community-driven projects is dependent on interpersonal relationships. Mosler et al. (2018) assessed the Community Led Total Sanitation project in Mozambique for the long-term maintenance of latrines to minimise open defecation. They used a RANAS model to analyse data from 640 households in cross section. They found that the degree of social cohesion among community members had an impact on latrine maintenance. The psychosocial consequences had a significant influence on the programme's effectiveness.

I can thus see that social cohesion is an important component for group projects to succeed. According to Carter and Castillo (2011), social capital is low in countries like South Africa, where legal costs are high and financial markets are thin or non-existent. In the KwaZulu-Natal province, they conduct artefactual field experiments to assess social capital and trustworthiness in local communities. Previously, in Zimbabwe's Chimanimani region, a study on social networks was conducted (Zuwarimwe and Kirsten, 2010). The study investigated the role of social networks in developing non-farm entrepreneurs in rural areas. They discovered that when starting a business and growing it, rural entrepreneurs depend on their social networks. They emphasise the importance of vertical and horizontal participation distinction. They demonstrate the role of social connections in the success of group projects, just as Carter and Castillo did.

My research aims to investigate the effects of the Mastercard Scholarship Program on the social capital of university students in South Africa, building on previous findings that show a low level of social capital in Southern Africa, especially in former homelands in South Africa. Few studies have looked at the effect of an intervention on social capital in a controlled setting. Attanasio et al. (2015) analysed the effect of a Conditional Cash Transfer (CCT) programme on social capital. They discovered that the programme improved cooperation.

In Limpopo, South Africa, a cluster randomised field trial was conducted to investigate the effects of the IMAGE project, which merged microfinance with participatory gender and HIV training, on structural and cognitive social capital (Pronyk et al., 2008). According to the findings, social capital can be increased exogenously and in a relatively short period of time.

In Zambia and Malawi, a World Bank initiative on social funds was examined by Vajja and White (2008), whose findings were contrary to the results reported by Attanasio et al. (2015) and Pronyk et al. (2008). They gathered information from key informants in two communities in each nation through using a standardised questionnaire, key informant interviews, and focus group discussions. They discovered that social funds have no effect on the development of social capital, and that the recipients are simply consumers of social capital that already exists in the society. They argue that investing directly in social capital is a bad idea, and that funds should instead be used to kick-start a mechanism that has already been tried and tested elsewhere.

Furthermore, few studies have been conducted among South African students using experimental economics. The investment game was used by Oyebode and Nicholls (2020) to ascertain whether a social norm acting as a nudge would affect the sums transferred. They studied 91 University of Pretoria undergraduate economics students. Following the social norm, the amounts transferred varied. After knowing about the social norm, those who had initially sent more then sent marginally less, and vice versa. The norm served as a reference point for making decisions that differed from those made previously. When coping with social norms of communication, the authors advise caution.

This research differs from that of Pronyk et al. (2008) in that it does not use a randomised field trial. Rather, I use an online lab experiment to see whether the Scholarship Program, which is aimed at supporting student welfare, has an impact on social capital. Experiments are conducted with two groups: Mastercard scholars and non-Mastercard scholars. I compare the results of the two groups to see how the Scholarship Program has affected the creation of pro-social characteristics that help scholars to build social capital. This research is an online lab project in which students participate in a series of economic experiments to observe their choices. To motivate subjects, economic incentives are used to imitate real-world incentives. This experiment is important because it will contribute to the statistical analysis used in experimental economics to assess the factors that influence the development of social capital.

2.4 Review of Literature on risk and trust relationship.

There have been questions raised about whether the Berg et al. (1995) investment game just tests trust, or whether there are other variables that influence the decisions made when sending money to the recipient. Several researchers have attempted to figure out exactly what the game is measuring. To determine whether the Trust game only evaluates trust, Chetty et al. (2020) used an incentivised experiment with a group of 200 students at the University of Cape Town in South Africa. They used the Trust game and found that the amounts sent were strongly related to risk attitudes, implying that the Trust game is not just for measuring trust.

Studying students from the University of Arizona, Cox (2004) used a triadic or three game design of the investment game to describe trust, reciprocity, and other grading preferences. He found evidence of trust, reciprocity, and altruistic desires for others. In like manner, Houser et al. (2010) used the investment game to conduct a study among students in Germany. They also used a multiple price list to run probit regressions on money-sending decisions and ordinary least squares on the sum sent to assess risk. Using a multiple price list in the risk preference elicitation challenge, they found a substantial relationship between amounts sent in environments of state uncertainty and amounts sent in environments of strategic uncertainty.

Bohnet and Zeckhauser (2004) used a binary choice Trust game and a binary choice Dictator game to ascertain whether trusting a stranger in a single short transaction is the same as taking a risk bet, or whether the trust decision is accompanied by an additional risk premium to compensate for the costs of trust betrayal. They found that when the outcome was determined by chance rather than whether the other player proved to be trustworthy, participants were more likely to take a risk. They concluded that taking the latter risked incurring betrayal costs in addition to monetary losses.

Non-students, on the other hand, have been studied to determine the trust risk confound relationship in the investment game. Adults in rural Paraguay were studied by Schechter (2007). To elicit risk, they also used the Multiple Price List approach. Using the binary Trust game, they ran an Ordinary Least Squares calculation on the amount sent. They discovered a significant association between trust decision and risk attitudes, unlike Eckel and Wilson (2004).

In Cameroon, another experiment was conducted with non-student participants (Etang et al., 2011). The risk trust confound was determined by playing the Trust game. On the sent amount

on the bet in risk task, they ran a censored interval regression. They concluded that the amounts transferred in the risk game are unrelated to risk attitudes, while the amounts sent in the Trust game are. There is no correlation between trust and risk-taking actions. The risk trust conundrum among students was recently revisited in a study conducted at the University of Cape Town (Chetty et al., 2020). They studied 202 students in an incentivised lab experiment to conduct a systematic study of the trust-risk confound. They deviated from previous research by using a risk preference task to see whether the earlier instruments used had measurement errors. They found that risk perceptions in the investment game influence how participants act in the Trust game. Other factors, such as preferences, influence the choices made by Trust game players, and thus the Trust game does not solely measure trust. Altruism, trust, trustworthiness, and cooperation have all been linked to social capital, and some research has indicated that risk attitudes can influence these behaviours. As a result, I use economic games to evaluate these five measures.

2.5 Economic Development and Social Capital

Social capital has received much attention, and several studies have been conducted to demonstrate that it is a significant component of economic development. To achieve what Putman and other researchers have suggested regarding social capital, there is certainly much work to be done. According to Woolcock (1998), social capital has a significant effect on the levels of production and profits in various countries. It is a crucial concept since it is the missing link of most economic growth theories (Grootaert, 2014). Many studies have been done to ascertain the impact of policies on social capital, which is an essential component in growth. A good social capital analysis is crucial because it will allow potential initiatives to be built in communities where the chances of success are higher.

Many scholars have separated social capital from human capital, and it is necessary to examine the social structures that influence it directly. Other types of capital are greatly influenced by these social systems. The issue arises when determining the social structures that must be considered when dealing with social capital, as various scholars have described them differently (Woolcock, 1998). Social capital should include family bonds, connections, kinships, networks, contacts, civic ties, and strong institutional ties for economic ventures to succeed (Stone and Hughes, 2002).

Social capital would influence the economy at both the micro and macro levels, and this must be considered. At the micro stage, I am talking about the interconnectedness that exists between intra-community relations (integration) and extra-community ties (linkages). I recognise synergy, which is the relationship between the state and community, and autonomy, which is the respect for established institutions, the willingness to maintain them, and the people's capacity to respond to social needs, all of which lead to organisational integrity. These four levels are important for economic growth. To achieve sustainable growth, societies must form social bonds that go beyond intra-community relations to combat high poverty levels (Woolcock, 1998). Initiatives that arise from a sense of belonging to one another and other communities comprise a form of development that is primarily based on social connections between people who share similar environments, experiences, and beliefs.

Bottom-up inclusion is an important part of social capital since people communicate what they know through the programmes and tools that are available, such as childcare, agricultural products, and work advertisements. The higher the degree of integration is, the stronger the ties of partnership and teamwork will be, as well as the potential for economic growth.

The top-down approach to growth is another choice. Members of societies and the tasks they engage in to improve their livelihoods would then take place in isolation. There is a system in place that governs all group actions to achieve a common goal. These organisations play a critical role in developing policies that affect growth. For development to be successful, it is necessary to have strong government–society relations. Relationships between the state and society may be both positive and weak. When they are low, and they are accompanied by low organisational honesty, chaos is the norm of the day, and most states collapse. If they are not followed by high organisational honesty, transactions would be inefficient and ineffective, resulting in poor states. Nevertheless, I can predict high levels of corruption and, as a result, rogue states if I have strong synergy but low organisational integrity. The best possible combination should be strong state–society relations and corporate integrity. I would have a government that is accountable, versatile, and cooperative with its society because of this mix, and the result is a developing world.

2.6 The Games

2.6.1 Introduction

Using lab experiments to measure the social preferences and social capital of participants is nothing new. The use of field studies regarding the social capital problem has exploded in the literature (Avdeenko and Gilligan, 2015; Bchir and Willinger, 2013; Bisin and Hyndman, 2020; Carter and Castillo, 2011). Field experiments have been used in a variety of settings, both rural and urban, to assess behavioural motives in groups such as trust, cooperation, reciprocity, and risk attitudes. In an online lab experiment, I use the four games to assess variations between MCF Scholars and other students.

2.6.2 Investment Game

To elicit trust behaviour, I will use the investment games developed by Berg et al. (1995). This is a two-player game in which one person takes on the role of "sender" and the other takes on the role of "receiver." The experimenter gives both players the same initial endowment (e.g., K units of experimental currency). To control for other motivations for the trustor to pass money to the trustee, initial endowments must be equalised. If the trustor's endowment is biased in his favour, he will feel compelled to transfer funds to equalise payoffs and alleviate his guilt.

The amount to be transferred to the trustee must be decided by the trustor. The amount transferred is tripled by the experimenter, resulting in the trustee receiving three times the amount sent by the trustor. The trustee must then choose between zero and the amount earned to return to the trustor. Under traditional behavioural assumptions, i.e. self-interested players, the trustee maximises his payout by returning nothing to the trustor. The trustor does not give anything to the trustee because he does not expect a return. This is the game's ideal sub-game equilibrium: zero reciprocity and zero trust. The game ends with the two players' initial endowments, i.e. a total payout of 2K.

The social optimum, on the other hand, would necessarily require complete trust. The trustee earns 3K when the trustor passes his endowment, which he adds to his own 1K to make 4K. To put it in other words, full trust increases the group payoff by two. This is an example of a social dilemma: the individual's interest is to mistrust, while the group's interest is to trust completely. Taking this into account, the trustor's transfer of funds can be seen as a representation of his trust in the trustee, whereas the trustee's return of funds can be seen as a

reflection of the trustee's trustworthiness or reciprocity. Trust is valuable in the investment game; however, it is risky because the trustee could be untrustworthy.

2.6.3 Dictator game

The Dictator game devised by Forsythe et al. (1994) is also a two-player game, but one of the players is a spectator. There are two positions in this game: sender and receiver. The Dictator, who is also known as the sender, is actively involved. The experimenter gives him a K-unit endowment, and he determines how much to send to an anonymous receiver. Since the receiver remains anonymous in the game, the motive for giving in the Dictator game is often interpreted as altruism (Carpenter et al., 2008). Some of the other interpretations are 'warm glow' (Andreoni, 1990), 'guilt aversion' (Battigalli and Dufwenberg, 2007), and 'institutions' (List, 2007). The Dictator game's decisions are often used to demonstrate how likely people are to donate to non-profit projects such as student solidarity funds, community donations for rehabilitating a community school, and charitable contributions.

2.6.4 Public good

Participants are allocated to teams in the Public Goods game formulated by Ledyard et al. (1995), where they may make voluntary contributions to create a social good. Other names for the game are 'Voluntary Contribution Mechanism' or 'Voluntary Contribution Game' (VCM) (Polania-Reyes, 2015). The VCM expresses the willingness among members of the group to cooperate through contributing money to a group account from which each participant would benefit, thus improving his or her well-being.

The experimenter gives each group member an equal endowment before he or she begins the game. Then, each person must determine how much to contribute to the group account. The remainder of the endowment is invested in each group member's private account. Regardless of how much each group member contributes, the amount in the group account benefits them all equally. The amount in a player's private account only benefits him or her.

At the individual level, the return from the private account is greater than the return from the group account in this game, which is like an investment game. Since the group account corresponds to a pure public good, the return from the group account is higher for the group payoff at the collective level (non-rivalry, non-excludability). This is because the group

account rewards all equally[3]. Since investing zero in the group account has a higher payoff, regardless of what other players contribute, it is the dominant strategy for each player. There will be no public good if each player follows this strategy. This strategy is not socially optimal because it disadvantages other participants. Indeed, the social optimum is for each member to contribute his or her entire endowment to the group account.

Let **w** represent an individual's endowment and **n** represent the number of members in a group. For the group account, the marginal return is $\alpha < 1$ and for the private account, it is 1. At the social optimum, the individual payoff is **α *n*w**, while at the Nash equilibrium (dominant strategies), it is **w**. There is a social dilemma if **$\alpha > 1/n$.** Some of the factors that might lead to cooperation in such a game include recurrence, communication, punishments, or rewards for action taken and unequal payments. This game is important because it allows for the measurement of people's willingness to pay for the provision of a public good, as well as the inclusion of instruments that aid in the coordination of cooperation and the regulation of free rider issues that occur among community members.

2.6.5 The Bomb Risk Elicitation Game (BRET)

Crosetto and Filippin (2013) introduced the Bomb Risk Elicitation game, which is a risk elicitation activity with incentives. I use Crosetto and Filippin's (2013, 2016) dynamic visual version, which has a ten-by-ten square with each cell representing a box. The Bomb Risk Elicitation game is an incentivised risk elicitation task (Crosetto and Filippin, 2013). I use the dynamic visual version, which has a ten-by-ten square with each cell representing a box, as Crosetto and Filippin (2013, 2016).

Participants in this game are informed that there are 99 boxes without the bomb and just one box with the bomb. The bomb will only explode at the end of the task, such as when all the choices have been made and all the cells have been opened, according to the game's programming. The cells open at random on the 10*10 square and do not obey order. Participants are not told how many cells are open at any given time, and they do not know how much earnings they have made until the game is over.

Crosetto and Filippin's designs are different in that their cells open automatically every second, starting from the upper left corner of the square. Subjects are informed of the number of cells

[3] Technically, the marginal per capital return (MPCR) must be strictly greater than 1/n, where n is the number of group members, and strictly less than1, since 1 is the marginal return from the private account.

that have opened at any given time, as well as the amount that they have gained. Subjects can stop the task at any time by pressing the stop button, which is not the case in my version since subjects cannot stop the task. Similar to the Crosetto and Filippin version, there is a start and the stop icon on the screen. From the time the participant chooses the number and presses the start icon, a box will be collected each time until all the boxes chosen have been played. The ticks will be seen on the screen by the participant during the game and if no bomb appears, the number of boxes opened will be what the participant wins. But, if a bomb appears, then the amounts that appear as ticks will be lost. The BRET has two advantages.

First, it presents many lotteries in a successive way, prompting participants to choose only two lotteries at any given time. This helps in ranking of lotteries from the safest to the riskiest and more rewarding. It also provides a very clear explanation of the probabilities that are involved in the game. It is simple and intuitive as it allows participants to understand it, even in situations with people having a less-favourable educational background; thus, the probability of confusing respondents is reduced.

Second, it is an important game as it allows for the measuring of risk attitudes when making decisions in uncertain instances. The game facilitates the estimation of the levels of risk-averse and risk-loving domains. There is no sure amount, as subjects can either choose a number greater than zero or choose zero. If they choose an amount greater than zero, they are not assured, as they are just as likely to pick the cell with a bomb. This game helps to determine how people are willing to take risks when a new technology or activity with the proposed benefits has been introduced in a community.

CHAPTER 3: METHODS AND PROCEDURES

3.1 Participants

I recruited participants via emails, which were sent to undergraduate, honours and post-graduate students in the Natural and Agricultural Sciences and Economic and Management Sciences (EMS) faculties at the University of Pretoria to invite them to participate in an online lab experiment. The two faculties were chosen because, in comparison to other faculties, they had a high number of Mastercard Foundation Scholars and because we obtained ethical approval from the two faculties. The invitation message was also shared on various WhatsApp groups that had the target participants such as the Mastercard Foundation Scholars WhatsApp group, and the NAS faculty departmental WhatsApp groups.

This was done to easily compare MCF and non-MCF students with similar characteristics. Those students who were willing to participate were asked to reply via email and share their WhatsApp number. Those who participated in the survey initially numbered 204(currently studying at university of Pretoria): 102 MCF Scholars (Currently on the scholarship) and 102 Non-MCF Scholars .[4] Due to funding constraints and the availability of MCF students in these faculties, the sample size was limited to 204. The total number of MCF scholars in these two faculties was estimated to be high. To balance the two groups, we had to match the control with the same sample size. Not all MCF scholars participated and only those that volunteered to participate account for the 102 which is approximately 68 percent of the MCF population currently studying at the University. My sample comprised Undergraduate, Honours and master's students from these faculties. The recruitment was done after getting approval from the respective Deans and ethical application approval from the Faculty according to University of Pretoria policy.

The participants were added to a dedicated WhatsApp group where further instructions were given. Three appointment times were given for a given day, and those who were available at the said times were asked to privately communicate via WhatsApp to provide their details. A list of subjects was compiled as each private message was received, with allocations of equal numbers for each group (treatment and control). Participants were asked privately to be online

[4] This number was reduced to 120 after establishing some errors in the way questions were administered wrongly to 84 of the subjects, and these observations had to be dropped from our data before analysis. This might have been the root cause of the skewness of the data. The dopped variables were not used in the analysis and our analysis was only based on the 120 observations.

at a specified time and day. A reminder was sent 45 minutes before the allocated time to check on the availability of the participants. A link was then shared 15 minutes before the session for those who confirmed availability.

3.2 Experimental setup

I conducted 17 sessions through using the O-tree framework, an open-source framework for laboratory, web, and field experiments (Chen et al., 2016). The O-tree framework was used to manage the games because it runs on any computer with a web browser and does not need any program to be installed on the participants' devices. An experiment written in O-tree, a local laptop, and subjects' devices with web browsers constituted the setup.

O-tree set up an experimental session on the online server, with links for all the participants. The links were then sent to the participants' personal web pages, which displayed the experiment and recorded their responses. The experimenter had access to the progress monitor and was able to identify which participant was lagging and to provide aid, so that the other participants were not affected. The progress indicator showed a log of the participants' responses.

The O-tree architecture ensures participant anonymity while also assisting in random grouping. I had 12 subjects in each session: six MCF scholars and six non-MCF scholars. Participants were required to complete five tasks: the Dictator game, the Trust game, the Public Goods game, the BRET, and a short survey in which they were asked to answer simple questions. They played alone in the Dictator game and the BRET, while they played with other scholars in the Trust game and the Public Goods game so that rewards were based (also) on real decisions made by other players. They did not know who they were paired with until the end of each session, and they did not get any input on the other students' choices. They answered questions about themselves and their relationships with other students in the survey.

Their gains were determined by their decisions as well as by those of the other players. They played secretly, which meant they had no idea who the other players were. Similarly, the people with whom they played were kept in the dark about their identities. At the end of the session, one of the four games was selected at random and paid out in real money. They only received the sum of Rands they earned for the game they chose, not for the others. However, they did not know which game would be paying in real money until the survey was over. All participants

were given a 50-Rand showing up fee, which was increased by the sum they earned in one of the selected games.

3.3 Experimental Games

Game 1: Dictator

In this task, participants were matched with another person online to form a pair. In each pair, there were two roles: sender and receiver. The sender was given 50 Rands and the receiver had nothing. The sender was told whether the receiver was a member of the Mastercard Foundation Scholarship or not. The sender decided how many Rands to send to the receiver. He or she could choose any amount between 0 and 50 Rands. The gain of the sender was equal to the number of Rands that they kept. The gain of the receiver was equal to the number of Rands that they received from the sender. As noted previously, the amount sent is widely viewed as indicative of the sender altruism.

Practically, the game was organised in such a way that all the players had the initial role of sender, as this allowed us to evaluate an indicator of altruism based on the amount sent for all the participants. However, to comply with the instructions shown to the players and avoid deception, when calculating the final payoff, participants were really paired with another random student of the session, and each was assigned a specific role of sender or receiver.

Game 2: Investment Game

In this game, students were paired up with another student online at random and anonymously. There are two positions in each pair: sender and receiver. The participants played both roles in this game. Participants began as senders, just as they did in the Dictator game. After playing the sender role, a screen appeared on which everyone was categorised as a receiver, and they all took on the role of the receiver. Since all participants were considered senders and receivers, I was able to obtain more data.

Senders were given 50 Rands. They were told whether the other player was on a Mastercard Scholarship. They had to determine how much to give to the receiver, after being informed that the receiver would receive three times the sum they sent, and that the receiver would potentially be able to send back some of the money received to the sender. They selected an amount from 0 to 50 Rands they wanted to send.

Participants in the receiver position were told whether the sender was on a Mastercard Scholarship. They needed to determine how much money to return to the sender. The participants were given scenarios in which they received money from a sender. They had to specify the sums to return if the sender had sent 30 Rands, 60 Rands, 90 Rands, 120 Rands and 150 Rands, respectively. The sender received a payment equal to the amount they did not send, plus the amount returned to them by the receiver. The payoff for the receiver was equal to the original total (R50) plus the amount received from the sender, minus the amount returned to the sender.

At the end of each session, a task was chosen at random and played for real. The program allocated one of the two roles to each student, and each student was paired with another individual who played the complementary role, so that the two participants in the pair could be compensated based on their choices.

Game 3: Public good

For this game, participants were members of a group of four players. In this game, I had three groups for consideration. The first group had all MCF Scholars, the second group had all non-MCF scholars, and the third was a mixture of two MCF Scholars and two non-MCF scholars.

Participants were asked to contribute towards a public good, depending on the group they were assigned. Each participant was given 50 Rands. Each group member determined how much he or she wanted to contribute to a group project. The participant could contribute any amount between 0 and 50 Rands. What they did not contribute to the project was kept by the participants. After all members of a group had chosen their contributions, the total amount contributed was doubled and divided equally between the four participants of the group by the software, so that each participant received the same payoff from the project.

Game 4: Bomb Risk Elicitation Task

In this game, there was a 10x10 matrix containing 100 boxes on the participants' screens. Participants had to make a choice on the number of boxes that they wanted to open. To do this, they directly typed the number of boxes they wanted to collect, or they could use the arrows (up and down) to increase/decrease the number of boxes they wanted to open. Once opened, the box was marked by a tick symbol.

Behind one of the boxes, there was a hidden ‘bomb’ that would ‘destroy’ everything that was opened. The remaining 99 boxes were worth R1.00 each, provided that the bomb did not explode. The bomb was planted randomly by the computer and participants did not know where the bomb was located. They only knew that the bomb could be anywhere, with an equal chance of being found. Participants had to press the 'Stop' button when they were satisfied with the number of boxes they wanted to open.

When they pressed the 'Solve' button, the contents of the boxes were revealed. Each of their opened boxes displayed a dollar sign or a fire symbol (for the bomb). All their earnings in the task were destroyed and their payoff was R0.00. If they opened boxes that did not contain the bomb, they received R1.00 for each of the boxes they had collected.

3.4 Post-experimental questionnaire

After completing the games, the participants were asked to fill out a questionnaire that included demographic questions, as well as questions about the participants and their relationships (see the questionnaire in the Appendix). The questionnaire included questions that enabled us to determine the extent of social networks and specified preferences for trust and trustworthiness, as well as altruism, cooperation, attitudes towards risk and group solidarity.

3.5 Data analysis

The data used was experimental data that was collected from an online experiment participated in by selected students from the NAS and EMS Faculties at the University of Pretoria in 2020. The data was downloaded from the O-tree platform in Excel format, and was cleaned and coded in STATA. All analysis was done in STATA.

To answer Objectives **a–e** and Hypothesis 1, I determined the treatment effects of the MCF Program by using the outcome variables (amount sent and returned in the Trust game, amount sent in the Dictator game, amount contributed to public good, and number of boxes collected in BRET). I compared the outcome variables between the MCF and non-MCF participants. I then tested for any significance difference in the outcome variables between the two groups.

I used Mann Whitney tests because my data was not normally distributed. To address Objective **f** on social networks, I ran chi-squared tests on the responses for subjects’ stated preferences from the post-experimental survey. I used the chi-squared test because I wanted to find out

whether the distribution of the categorical variables from the MCF group differed with those from the non-MCF group.

The Mann Whitney tests were then used to evaluate Hypothesis 2. The presence of in-group favouritism and out-group discrimination between the groups was determined. The difference in amounts sent to the in-group (MCF or Non-MCF) and the out-group (Non-MCF or MCF) is referred to as in-group favouritism. In-group favouritism is described as the difference between the amounts sent to the in-group (MCF or Non-MCF) and the out-group (Non-MCF or MCF).

I hypothesised that in-group favouritism exists in my sample, as studies in social psychology and economics report that subjects tend to favour in-group members (Hewstone et al., 2002; Jiang and Li, 2019; Tajfel, 1982). Generally, people tend to favour individuals that belong to their own group (Grimm et al., 2017). Due to the continuous existence of the five outcome variables, I used Ordinary Least Squares (OLS) regression. OLS regressions were used to determine the factors affecting the observed game behaviour. The following explanatory variables predicted the continuous dependent:

1. $Amount\ sent\ Dictator\ game = \beta_0 + \beta_1 MCF1 + \beta_2 age + \beta_3 gender + \beta_4 contribute\ time + \beta_5 contribute\ money + \mu$
2. $Amount\ sent\ back\ 150\ Trust\ game = \beta_0 + \beta_1 MCF01 + \beta_2 age + \beta_3 gender + \beta_4 trust\ alert + \mu$
3. $Amount\ sent\ Trust\ game = \beta_0 + \beta_1 MCF1 + \beta_2 age + \beta_3 gender + \beta_4 marital\ status + \beta_5 new\ friends\ \beta_6 education\ \beta_7 trust\ sent\ back\ \beta_8 trust\ general + \mu$
4. $Amount\ contributed\ to\ PG = \beta_0 + \beta_1 MCF1 + \beta_2 age + \beta_3 gender + \beta_4 group\ cooperation + \beta_5 risk\ in\ financial\ matters + \mu$
5. $Number\ of\ boxes\ collected\ BRET = \beta_0 + \beta_1 MCF01 + \beta_2 age + \beta_5 marital\ status + \beta_3 risk\ in\ financial\ matters + \beta_4 PG\ contribution + \beta_5 new + \mu$

CHAPTER 4: RESULTS

4.1 Sample descriptive statistics

This section presents the main descriptive statistics about the sample and discusses certain statistical differences in terms of socioeconomic and demographic attributes between the control group and the MCF group. The summary statistics of the individual participants are shown in Table 4.1 below. I treat age and parental size as categorical variables, like all other variables in the table. Ages range from 19 to 37 years and parental household size from 1 to 20 members per family. I therefore run chi-squared tests to check for significant differences between samples.

Table 4.1 suggests that there were no statistically significant differences between the Mastercard Foundation Scholars (MCF) (treated) and non-Mastercard Foundation Scholars (non-MCF) (control) observations for the following covariates: age, gender, ethnicity, society, marital status, participation in elections, political view, and religion. Differences between the treated and control groups exist in terms of education and parental household size (distribution of frequencies, Chi-squared p-value < 0.05). Except for these two latter variables, a good balance was then achieved in the samples representing the control and the treated group. The observed differences in terms of educational level[5] and parental household size should then be taken into consideration to explain the effects in the experiments.

[5] The MCF group included more master's and Honours students than the non-MCF group did. The non-MCF group included more undergraduates than MCF group did. The differences are attributed to the self-selection of participants from the two faculties.

Table 4.1: Summary of descriptive statistics of the sample

Variables	MCF (N=58)	Non-MCF (N=62)	Total (N=120)	Chi2 p-value
Age (years)	24.24 (0.527)	22.90 (0.320)	23.55 (0.309)	0.148
Parental size (number)	5.93 (0.397)	5.73 (0.404)	5.83 (0.283)	0.033
Gender (%)				0.562
Female	48.28	51.61	49.17	
Male	51.72	46.77	50	
Other	-	1.67	0.83	
Ethnicity (%)				0.181
Black	100	91.94	95.83	
Coloured	-	1.61	0.83	
White	-	3.23	1.67	
Indian/Asian	-	-	-	
Other	-	3.23	1.67	
Society (%)				0.46
Rural	27.59	24.19	25.83	
Semi-urban	41.38	33.87	37.5	
Urban	31.03	41.94	36.67	
Education (%)				0.001
Undergraduate	50	82.26	66.67	
Honours	10.34	6.45	8.33	
Master's	39.66	11.29	25	
Marital status (%)				0.275
Single	98.83	83.87	89.17	
Married	3.45	4.84	4.17	
Separate/Entanglement	-	3.23	1.67	
Cohabiting	-	3.23	1.67	
Prefer not to say	1.72	4.84	3.33	
Elections (%)				0.698
Yes	74.14	70.97	72.5	
No	25.86	29.03	27.5	
Political view (%)				0.161
Very conservative	13.79	17.74	15.83	
Slightly conservative	24.14	12.9	18.33	
Slightly liberal	24.14	17.74	20.83	
Very liberal	15.52	32.26	24.17	
Prefer not to say	22.41	19.35	20.83	
Religion (%)				0.175
Christianity	94.83	87.1	90.83	
Buddhism	-	1.67	0.83	
Judaism	-	-	-	
Islam	3.45	-	1.67	
Hinduism	-	-	-	
Other	-	1.61	0.83	
None	1.72	6.45	4.17	
Prefer not to say	-	3.23	1.67	

Standard errors in parenthesis

4.2 Treatment effects on the outcome variable from the games

To check for treatment effects, a non-parametric statistical test (Mann Whitney test) was used. As a significant measure, a p-value of 5% was used. The results presented in the appendix are in fact not normally distributed, and this does not allow for the use of parametric tests like the t test for treatment effect analysis. I present first (4.2.1) the effects resulting from the participation in the program MCF in comparison with the control represented by subjects not taking part in the program. I then illustrate (4.2.2) the effects resulting from the interactions between subjects of the two groups: MCF and non-MCF.

4.2.1 MCF vs. non-MCF subjects

Table 4.2 below presents the means (and corresponding median) and MW p-values of the variables used to represent subjects' choices in the four games included in my experiment (see the explanation of the games in the methods and procedures section). In the Dictator game, the observed variable is the amount sent by the sender to the receiver. I have two variables in the Trust game: trust, which is calculated by the amount sent by the sender to the recipient; and trustworthiness, which is measured by the percentage of the received amount returned to the sender. The observed variable in the Public Goods game is the individual's contribution to the group effort. Finally, in the BRET game, the observed variable is the number of cells opened by a subject, where opening more cells indicates being more risk tolerant (or less risk averse).

The results for the MCF and non-MCF groups are presented in the table. The first three games assess the subjects' pro-social behaviours, such as altruism, trust and reciprocity, and cooperation while contributing to the provision of a public good. The fourth game, the BRET, assesses the participants' willingness to take risks or attitudes toward danger. MCF subjects send more money in the Dictator and Trust games, reciprocate more in the Trust game, and contribute more to a public good, even though the p-values of the MW tests are not significant. Being a member of the MCF Scholar's community has no impact in the BRET game.

Table 4.2: Summary of observed Median (Mean) amounts in the games

Outcome variable	MCF (N=58)	Non-MCF (N=62)	Total (N=120)	MW p-value
Dictator amount sent (ZAR)	25.0 (25.2)	23.5 (24.6)	25.0 (24.9)	0.8963
Trust amount sent (ZAR)	30.0 (31.2)	27.5 (28.7)	30.0 (29.9)	0.3504
Trust amount sent-back (% of the received)	46.8 (44.6)	33.9 (39.9)	42.1 (42.1)	0.1688
Public good contribution (ZAR)	37.5 (35.1)	30.0 (30.5)	30.0 (32.7)	0.6503
BRET (collected boxes)	50.0 (45.1)	50.0 (44.5)	50.0 (44.8)	0.8664

Source: Experimental data collected by Author

My results are in line with what earlier studies have found. Avdeenko and Gilligan (2015) found that an international intervention in Sudan to build social capital had no significant effect on the pro-social behaviour of the participants in the lab. Similarly, Mansuri and Rao (2012) found no considerable impact of collective action on citizen participation in their research on participatory development programmes. Wong (2012) conducted an in-depth study of 14 CDD programmes, finding that they enhance public service delivery, but have little impact on the creation of pro-social behaviour.

As seen from Table 4.2, MCF subjects contributed about 50 percent of their endowment, while 47 percent was contributed by non-MCF subjects. This is in line with what Avdeenko and Gilligan (2015) reported in their study, that subjects gave more than 50 percent of their endowment. My results are higher compared with what was reported in meta-analysis done by Engel (2010), who reported that participants gave about 28% of their endowment, on average.

In the Trust game, MCF subjects sent approximately 60% of their endowment, while non-MCF subjects sent approximately 55%. This is slightly higher than the results of Johnson and Mislin's (2011) meta-analysis of the confidence games report, which found that participants sent an average of 50% of their endowment to demonstrate trust levels. Avdeenko and Gilligan (2015) discovered that in the Trust game, subjects sent about 47 percent of their endowment from both the treated and control groups in their assessments of international interventions on building social capital in Sudan.

I found that approximately 90 percent of the subjects in both the MCF and non-MCF groups returned tokens they received from the sender, and 10 percent did not return to the sender. Table 4.2 shows that, on average, MCF subjects returned about 46 percent of the Rands received, while 33 percent of the Rands received was returned by the non-MCF subjects. This result is higher than what Avdeenko and Gilligan (2015) reported in their study. They found that about one-third of what was received was returned by the subjects to the sender in both the treated and control groups.

My findings are similar to those of Johnson and Mislin (2011), who found that recipients returned 37% of what they received to the sender in their meta-analysis. According to their findings, subjects from African countries returned less than those from Western countries did. My findings show that 93 percent of the subjects in both the MCF and non-MCF groups contributed some positive amount towards a public project. This result is higher than what Avdeenko and Gilligan (2015) reported in their study. Approximately 76 percent of the subjects of both the treated and control groups in their study contributed to the development of a public good (Avdeenko and Gilligan, 2015). Table 4.2 shows that the MCF community contributed approximately 75% of their endowment, on average. This amount is higher than the non-MCF group's contribution of 60% of the total endowment.

Regarding the BRET game, Table 4.2 shows that subjects from both the MCF and the non-MCF group approximately opened 50 cells, on average. My results are in line with what Crosetto and Filippin (2013) found when they presented the BRET. They reported that subjects, on average, opened 46 cells. Their number still falls in the risk-aversion zone, as it is less than the neutral point of 50, while my sample it is at neutral point. Using the cumulative distribution of choices, I find that 46.22 percent of the participants were in the risk-aversion zone ($K \leq 49$), 20.17 percent of the subjects were in the risk neutral zone ($k=50$), and 33.61 percent of the subjects were in the risk-loving zone ($k \geq 51$).

My results mirror the general findings reported by Crosetto and Filippin (2013) in their study when they presented the BRET. They found risk-averse subjects at about 52.1 percent, risk neutral subjects at 14.7 percent, and risk-loving subjects at about 33.2 percent. Most of the subjects from my sample were risk averse, followed by risk loving, with the smallest group being risk neutral.

4.3 Degrees of in-group favouritism and out-group differentiation

As social capital is often a question of inter-relations among subjects, in this section I observe the behaviour of subjects from the two groups when they are put in relation with members of the same group or of the other group. I check for possible favouritism within the same group or discrimination against members of other groups.

Literature identifies the existence of such behaviours. In their analysis of in-group favouritism and out-group discrimination in a multiplayer Dictator game in a naturally occurring group environment, Abbink and Harris (2019) found both in-group favouritism and out-group discrimination. Out-group discrimination, they say, only occurs when two groups are at conflict, as in the case of two rival political parties.

In their meta-analysis of in-group favouritism in cooperation, Balliet et al. (2014) found that in-group favouritism is greater when there is a mutual understanding of group membership and during simultaneous exchanges. Grimm et al. (2017) found that senders sent more points to in-group members than to other groups in their analysis of in-group favouritism and discrimination among multiple out-groups of students from the same university, but different departments.

I found that the only subjects showing a significantly different behaviour throughout the games were the non-MCF subjects, when they were related with subjects of the MCF group. This is in the sense of a discriminatory behaviour, i.e. reducing cooperation (PG) and trust (both sending and reciprocating). Conversely, MCF subjects did not seem to make a significant difference between subjects of their group and subjects outside their group.

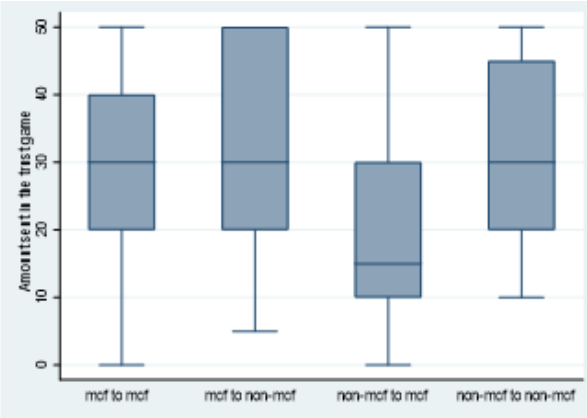
Finally, non-MCF subjects seem to have the same level of cooperation and trust as MCF subjects have, when related with other non-MCF subjects (i.e. within the same group). Table 4.3 shows the means and medians of the amounts that the participants in the non-MCF and MCF groups allocated to members from the same group and to members of a different group. I expected to observe in-group favouritism in both groups, but I found results contrary to what Abbink and Harris (2019) and Grimm et al. (2017) show. I found cooperation within and across the group in the MCF group, while in the non-MCF group I found cooperation only within the group.

Table 4.3: Summary of medians (means) on different degrees of in-group favouritism

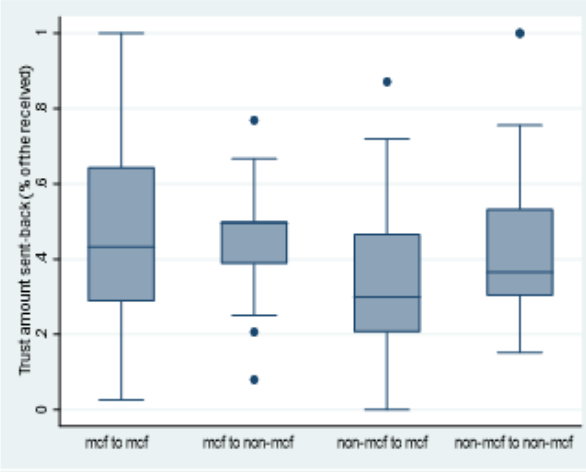
Interaction	Trust	Reciprocity	Dictator	Public Good	Observations
mcf to mcf	30 (31.0)	0.43 (0.44)	25 (27.3)	40 (35.4)	38
mcf to non-mcf	30 (31.5)	0.50 (0.45)	25 (21.3)	30 (34.5)	20
non-mcf to mcf	15 (21.5)	0.30 (0.33)	20 (21.3)	22.5 (19.7)	20
non-mcf to non-mcf	30 (32.1)	0.37 (0.43)	25 (26.2)	40 (35.6)	42
Total					120

Source: Experimental data collected by author

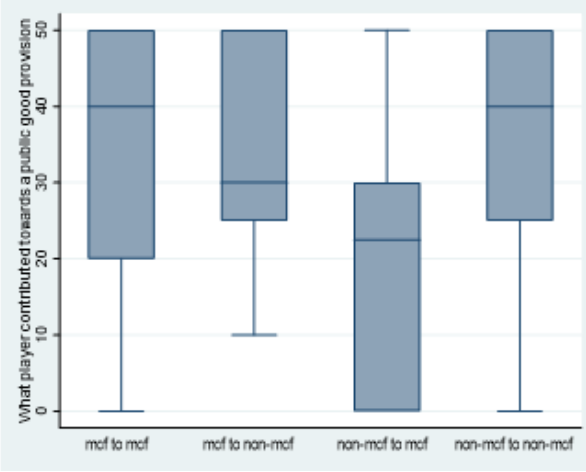
The boxplots shown in Figure 4.1 show the outcomes distributions in the 4 subgroups presented in Table 4.3 in the games, where some differences between groups are significant, and the corresponding MW p-values are reported in the tables besides the plots.



Interaction(Trust amount sent)	Observation	Ranksum	Z-value	P-value
mcf to mcf	38	1111.5		
mcf to non-mcf	20	599.5	-0.158	0.8749
mcf to mcf	38	1264.5		
non-mcf to mcf	20	446.5	2.372	**0.0177**
mcf to mcf	38	1503.5		
non-mcf to non-mcf	42	1736.5	-0.346	0.7294
mcf to non-mcf	20	482		
non-mcf to mcf	20	338	1.971	**0.0488**
mcf to non-mcf	20	626		
non-mcf to non-mcf	38	1327	-0.061	0.9514
non-mcf to mcf	20	471.5		
non-mcf to non-mcf	30	1481.5	-2.413	**0.0158**
Source: Experimental data collected by author				



Interaction(Trust amount sent-back)	Observation	Ranksum	Z-value	P-value
mcf to mcf	38	1089.5		
mcf to non-mcf	20	621.5	-0.516	0.6057
mcf to mcf	38	1230		
non-mcf to mcf	20	481	1.784	**0.0744**
mcf to mcf	38	1569.5		
non-mcf to non-mcf	42	1670.5	0.294	0.7686
mcf to non-mcf	20	491		
non-mcf to mcf	20	329	2.204	**0.0276**
mcf to non-mcf	20	671		
non-mcf to non-mcf	38	1282	0.62	0.535
non-mcf to mcf	20	517		
non-mcf to non-mcf	30	1436	-1.706	**0.0881**
Source: Experimental data collected by author				



Interaction(Public good contribution)	Observation	Ranksum	Z-value	P-value
mcf to mcf	38	1139.5		
mcf to non-mcf	20	571.5	0.313	0.7546
mcf to mcf	38	1307		
non-mcf to mcf	20	404	3.094	**0.002**
mcf to mcf	38	1534.5		
non-mcf to non-mcf	42	1705.5	-0.045	0.9641
mcf to non-mcf	20	506.5		
non-mcf to mcf	20	313.5	2.644	**0.0082**
mcf to non-mcf	20	610		
non-mcf to non-mcf	38	1343	-0.312	0.7553
non-mcf to mcf	20	421		
non-mcf to non-mcf	30	1532	-3.205	**0.0013**
Source: Experimental data collected by author				

Figure 4.1: Interactions between MCF and non-MCF subjects: amounts sent and sent back in the Trust game and contribution in the PG game

Source: Author's analysis

4.4 Stated preferences from the survey after the experiment

Some authors (Avdeenko and Gilligan, 2015) have shown through lab-in-the-field experiments that retrospective survey measurements of social capital offer biased evidence of positive

effects of development programmes. To crosscheck whether a similar result could be observed in my case, where the MCF Program represents the development program, a survey was implemented and submitted to both non-MCF and MCF subjects after the experiments. The sets of questions in the survey were meant to establish the levels of stated preferences on pro-social attitude and on the creation of social capital in the group to which subjects belong (MCF group or other).

I asked questions to elicit information regarding participants and how they behave in certain situations. The full set of questions is available in the Appendix, and it focuses on the following attitudes and preferences: belonging to a group and perceiving differences within that group, risk perception, group member trust, general trust, reciprocity, and group members' willingness to help and cooperate. The results of the survey showed a general similarity between MCF and non-MCF subjects in terms of stated perception of their pro-social behaviour and creation of social capital within their group. This is supported by the non-significant variations found in the experiments conducted.

Table 4.4 below refers only to those questions where replies indicate a significant difference ($p < 0.05$) between MCF and non-MCF subjects, as measured through a chi-squared test on the frequencies of replies to the options provided to the responders. MCF members seem to have a lower attitude towards mistrust of other members of the same group, as indicated in the reaction to the sentence "*In this group, one must be alert, or someone is likely to take advantage of you"*. MCF members show significantly higher disagreement with this sentence, while non-MCF members show higher agreement, and even strong agreement. MCF members are also less prone to reciprocate negative behaviour than non-MCF members are, as indicated by the reactions to the sentence "*If somebody puts me in a difficult position, I will do the same to him/her"*.

Such stated preferences towards social behaviour might explain the differences observed in the experiments where MCF and non-MCF subjects are placed in relation with subjects of the same groups or with subjects of the other group. The higher percentage of non-MCF members prone to reciprocate a negative behaviour, as well as the higher share of non-MCF members showing mistrust of other members of the same group, could be at the origin of the out-group discrimination observable in the Trust game and in the PG game. In other terms, non-MCF subjects declare a higher attitude of mistrust of members of the same group and a higher attitude to reciprocate negative behaviours. While this is not sufficient to change their behaviour when

put in relation with members of the same group, it might produce a discriminant behaviour in this sense when the non-MCF subjects are put in relation with MCF subjects. Conversely, the stated social preferences of MCF subjects would explain lower discriminant behaviour toward non-MCF subjects, as they show a lower attitude towards reciprocation of negative behaviour and lower mistrust of others.

Table 4.4: Participants' perceptions of trust and reciprocity in the group they belong to

Variables	MCF (N=58)	Non-MCF (N=62)	Total (N=120)	Chi2 p-value
In this group, one must be alert, or someone is likely to take advantage of you (%)				0.036
Disagree strongly	15.83	10	25.83	
Disagree somewhat	14.17	7.5	21.67	
Neither agree nor disagree	6.67	9.17	15.83	
Agree somewhat	7.5	15	22.5	
Agree strongly	4.17	10	14.17	
If somebody puts me in a difficult position, I will do the same to him/her (%)				0.033
Disagree strongly	25.83	16.67	42.5	
Disagree somewhat	14.17	19.17	33.33	
Neither agree nor disagree	6.67	5.83	12.5	
Agree somewhat	0.83	6.67	7.5	
Agree strongly	0.83	3.33	4.17	

Source: Experimental data collected by the Author

4.5 Determinants of observed game behaviour

I used OLS regression analysis (Tables 4.5 and 4.6) to determine the effect of demographic and treatment covariates on the outcomes of the four games used in the experiments. Through those models, it was also possible to relate some attitudes emerging from the survey post-experiment with the experiments' outcomes.

In terms of treatment effects, being a member of the MCF Program has a significant and positive (p=0.07) effect only on the PG game, while negative discrimination is significant for non-MCF subjects when reciprocating in the Trust game. In both the Dictator and Trust (send) games, age has a significant and positive impact, while female subjects send less in the Dictator

game and reciprocate less in the Trust game, contrary to the literature. In the Trust game, married subjects send lower amounts. Except for honour's subjects who send more in the Trust game, being a graduate or undergraduate student has no effect on the observed variables. This result prompts us conclude that the duration of a subject's presence in the MCF Program does not affect the results.

Some variables resulting from the answers to the survey are significantly correlated with the results of the experiments: subjects stating that others are very likely to cooperate, and subjects stating that others are unlikely to cooperate and contribute more to the PG game. This is an interesting result, as the latter subjects could contribute more as a signal to 'redress' the behaviour of others.

Subjects indicating that they look for new friends in the group they belong to send significantly more in the Trust game. This is also true for subjects who say they have more trust in general in the Trust game. The amount sent back (reciprocity), and the amount sent in the Trust game have a strong and positive correlation. In the Trust game, subjects who regard others as trustworthy send more.

Subjects willing to take risk in financial matters both contribute more in the PG game and are more prone to take risk in the BRET. In the latter game, subjects who contribute more to the PG game risk more (open more cells). This is interesting, as it shows that subjects contributing to the PG game have an objective of profit maximisation and are ready to take a risk in the common enterprise of the group.

Table 4.5: Primary determinants from the Trust game

Variables	Trust amt sent	Trust sent back 150
MCF1	1.453	
	(2.695)	
Age	0.864*	-0.120
	(0.499)	(0.914)
Female	-1.606	-10.59*
	(2.511)	(6.217)
Other gender	22.75*	-45.39
	(13.61)	(33.84)
Married	-13.05*	
	(6.754)	
Separate/entanglement	-12.78	
	(9.803)	
Cohabiting	-0.222	
	(10.21)	
Prefer not to say	-16.69**	
	(6.855)	
Yes (new friends)	12.93**	
	(5.167)	
Honours	11.75**	
	(4.829)	
Masters	-3.596	
	(3.896)	
Trust sent back (ZAR)	0.109**	
	(0.0418)	
Trust general(ranking)	1.140**	
	(0.466)	
MCF01		-14.08*
		(8.183)
Trust (alert)		
Disagree somewhat		0.698
		(8.918)
Neither agree nor disagree		12.25
		(9.728)
Agree somewhat		-5.091
		(8.817)
Agree strongly		-20.13*
		(10.37)
Constant	-10.84	77.79***
	(13.28)	(23.13)
Observations	120	120
R-squared	0.303	0.127

Standard errors in parentheses

**** p<0.01, ** p<0.05, * p<0.1*

Table 4.6: Primary determinants from the Dictator, Public Goods, and BRET games

Variables	Dictator amt sent	PG contribution	BRET collected
MCF1	-0.335	5.535*	
	(2.419)	(2.966)	
Age	0.948**	-0.654	-1.037
	(0.364)	(0.456)	(0.767)
Female	-5.099**	-0.211	
	(2.381)	(3.102)	
Other	25.60*	3.587	
	(13.11)	(16.21)	
Somewhat unlikely to cooperate		22.16*	
		(11.55)	
Neither likely nor unlikely to cooperate		9.096	
		(8.501)	
Somewhat likely to cooperate		11.42	
		(7.431)	
Very likely to cooperate		14.63*	
		(7.572)	
Risk in financial matters		1.238**	1.636*
		(0.611)	(0.971)
Contribute time	6.048		
	(5.209)		
Contribute Money	-0.0915		
	(5.282)		
MCF01			8.084
			(7.080)
Married			0.416
			(12.77)
Separate/entanglement			-18.59
			(18.70)
Cohabiting			-6.282
			(18.63)
Prefer not to say			5.590
			(13.36)
Public good contribution			0.348**
			(0.162)
Constant	-0.508	25.69**	46.62**
	(9.756)	(12.72)	(19.07)
Observations	120	120	119
R-squared	0.133	0.115	0.098

Standard errors in parentheses

**** p<0.01, ** p<0.05, * p<0.1*

CHAPTER 5: DISCUSSION AND CONCLUSION

The aim of this study was to see if the Mastercard Scholarship Program at the University of Pretoria influences the level of social capital among its scholars. I designed an online experiment composed of four well-known games (Trust game, Dictator game, Public Goods game, BRET), and collected stated preferences through a survey that followed the games.

The study evaluated the Mastercard Scholarship Program in endeavouring to answer the question: Can a scholarship program and its activities provided to scholars change the participants' pro-social behaviour to increase social capital? I tested Hypothesis 1, which stated that: *pro-social behaviour is more evident in the MCF group than in the non-MCF group*. My findings do not corroborate Hypothesis 1, as there is no significant treatment effect in my experiments. However, MCF subjects exhibit similar behaviour when relating with both MCF subjects and non-MCF subjects. This shows the closeness that exists within the MCF group and the lack of competition that MCF subjects show towards members of the non-MCF group.

I can also attribute this finding to the observed different perceptions of trust within the group and reciprocity of negative behaviour (see survey results). A greater number of non-MCF subjects mistrust people in the group and reciprocate negative behaviour, and this can be at the origin of the observed significant differences in the games (Trust, PG) when non-MCF subjects are related with MCF subjects.

In the Trust game, non-MCF subjects sent smaller amounts to MCF subjects and contributed smaller amounts in the Public Goods game than they did to their in-group (non-MCF). Therefore, even though there are no significant differences between the groups in the experiments, these differences emerge when subjects from one group interact with subjects from the other group. This is particularly so when non-MCF subjects are related with MCF subjects. Negative discriminatory behaviour appears in this case. This could lead one to believe that the MCF Program has a positive impact on participants' pro-social behaviour because it decreases both distrust of other members and reciprocation of negative behaviours, encouraging subjects to behave in the same way with non-MCF subjects as they do with MCF subjects.

This partially confirms Hypothesis 2: "*The positive effects of the MCF Program on pro-social behaviour are visible also when MCF subjects relate with other non-MCF subjects*". However, the significantly lower outcomes regarding non-MCF subjects as compared with MCF subjects,

as well as the fact that MCF subjects 'play well' with in-group and out-group participants, suggest that the MCF Program reduces out-group discrimination and in-group favouritism.

This 'positive effect' of the MCF programme, reinforced by the survey analysis, is not evident when comparing MCF and non-MCF (H1), but is evident when looking at the relations between subjects of the different groups (H2). The positive effect of the MCF Program resides in the reduction of out-group discrimination and in-group favouritism among the MCF group members.

I find a consistent pattern between the behavioural measures in the games and the self-reported survey measures from the survey. Respondents in the treated group did behave more pro-socially in the games, not because of fearing repercussions for sending smaller amounts of Rands, but rather because of the better social relations existing among the group members. Thus, if I was to trust the correlation of the self-reported survey responses and the observed game behaviour in the treated group, this behaviour must be attributed to the effects of the MCF Scholarship Program.

Accordingly, a development programme like the MCF does not increase social capital per se, but it reduces the level of mistrust and reciprocation of negative behaviour, improving then the relations with subjects outside the group (this hypothesis, based on the observation of results, should be tested through further research). I do not know of any study on developmental programmes that directly assessed the impact of a programme on the level of mistrust and reciprocation of negative behaviour in the project intervention area. Thus, my findings will need further research to establish the factors that lead to a subject's exhibition of a reduction in mistrust and reciprocation of negative behaviour. Most studies on developmental programmes have focused on assessing citizen participation in local governance, public service delivery such as health and education, and local self-help groups such as savings groups.

As people grow older, they tend to respond in socially desirable ways (Freund and Blanchard-Fields, 2014). The positive relationship between age and the amounts sent in the Dictator and Trust (send) games confirms this. People tend to be more altruistic and trusting as they grow older, as is evident in my results.

I expected to find that females were more altruistic and more reciprocating. This was not the case, as females showed that they lacked social responsibility, and that they were not willing

to share and give. This might be attributed to the amount of time they were given to think over their decisions, and this detrimentally affected their natural altruistic behaviour.

Subjects who stated that they are unlikely to cooperate contributed more to the Public Goods game than those that stated that they are willing to cooperate did. In real life, the former group would contribute more because they want only to fix a problem that was affecting them, and could benefit if they were to contribute. People who are social often tend to look for new friends, and these people tend to have high levels of trust towards strangers. Thus, I observed from my results that a correlation existed between people who trust in general and the amount that was sent in the Trust game. People who are risk takers tend to engage in different income-generating activities that could maximise their profits. I expected these people to send more money in the Trust game because they would assume that the responder would return Rands to them, but this was not the case. This was apparent in both the amounts contributed in the Public Good and in the BRET games. To maximise income, they added more in the Public Good game and opened more cells in the BRET game.

My conclusion, then, is that the MCF Scholarship Program had a significant effect on certain aspects of social capital in the MCF group. However, in the experiments performed to test H1, these components were insufficient to produce significant effects. Some factors linked to the present conjuncture can further explain the results from the experiments. The MCF Program engages scholars to participate in different activities, such as outings, special holidays like Heritage Day, and braais. However, due to the Covid-19 pandemic, interactions were prohibited throughout the year. Due to the countrywide lockdown and restrictions imposed to control the pandemic, there was no way by which these interactions might have been fostered.

5.1 I expected the social capital of MCF scholars to be significantly higher than that of the non-MCF group, but this was not the case in the experiment conducted, although I have several points that I should kept in mind. First, apart from my emphasis on social capital, the Scholarship Program has other objectives, which I have not assessed. Secondly, my sample consisted of a diverse group of scholarship recipients, with varying lengths of time on the Program. A further research study could be conducted to assess the degree of social capital of scholars who have already progressed through the Program, from undergraduate to master's levels. I think that the results of such a study would be different from what I have found. I acknowledge causality in my research. Further research should use quasi-experimental methods like Propensity Score

Matching or an endogenous switching regression model, in my view. If the samples chosen were not random, these will easily aid in the control of selection bias. Hypotheses about the causal impacts of the projects of interest should be tested.Recommendations

The study suggests that the MCF Program should raise the awareness about cognitive social capital among MCF Scholars. This could be accomplished by engaging in improved education for its students on the value of cooperation, altruism, social responsibility, trust, and trustworthiness in the development of cognitive social capital.

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Appendix

Testing for normality of the dependant variable in the games

Outcome variable	Pr(Skewness)	Pr(Kurtosis)	p-value
Dictator amount sent	0.0249	0.5328	0.0698
Trust amount sent	0.7091	0.0000	0.0000
Trust amount sent-back	0.0000	0.0096	0.0001
Public good contribution	0.0346	0.0006	0.0012
BRET collected boxes	0.4663	0.0012	0.0082

Source: Experimental data collected by the Author

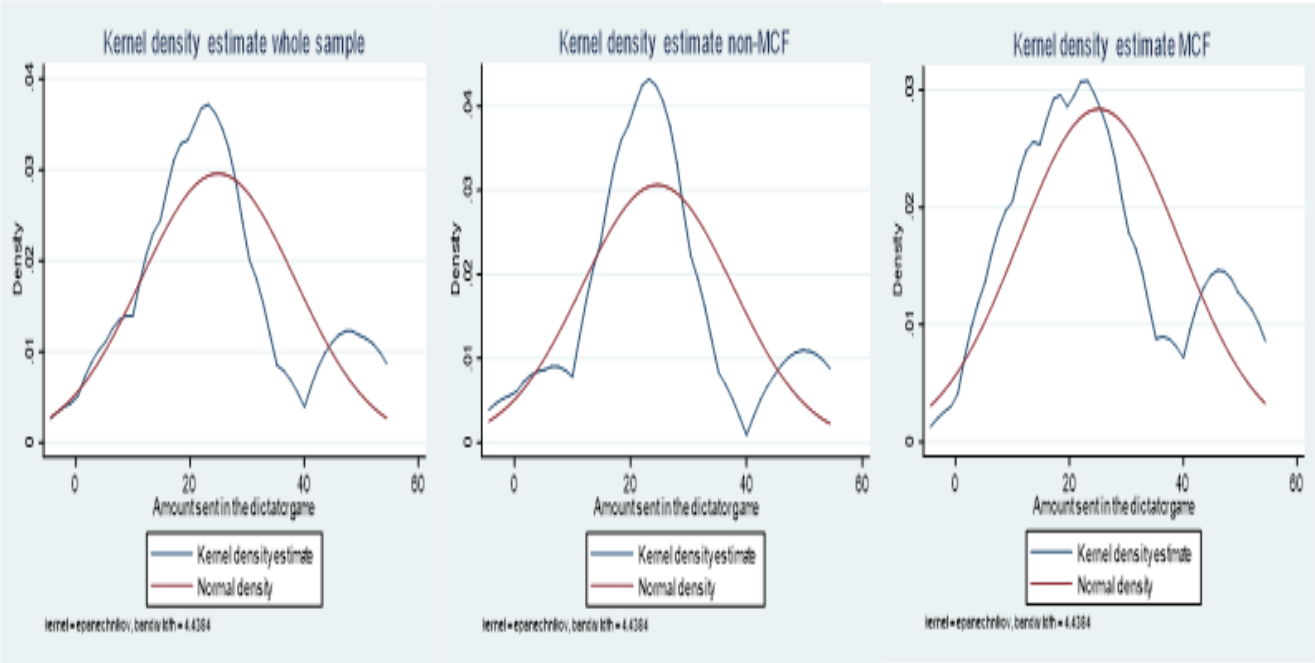
The skewness results are 0.498, -0.079, 1.073, -0.467, and 0.156 for the Dictator game amount sent, Trust game amount sent, Trust game amount sent-back, Public Good game contribution, and BRET collected boxes, respectively. The kurtosis figures for the result variables are 2.67, 1.75, 4.53, 2.09, and 2.12, respectively, in the same order. Since absolute skewness and kurtosis values less than one are classified as mild non-normality, those between 1 and 2.3 are classified as moderate non-normality, and those greater than 2.3 are classified as extreme non-normality (Blanca et al., 2013). As a result, null hypothesis that the outcome variables have a normal distribution are rejected. My research uses the Mann Whitney MW test to search for treatment effects of the Program. This test compares means and is a form of dependency test that assumes the variables can be divided into independent and dependent variables (Kanwat et al., 2012).

The MW test assumes that the differences in the mean scores of the dependent variable are caused by the independent variable. The F-test, ANOVA, and t-test are examples of tests that compare the mean scores of two or more classes. The MW test, unlike these tests, is a non-parametric level test (Kanwat et al., 2012). It makes some assumptions about the distribution of the dependent variables that are being included in the analysis. Since my dependent variables are not normally distributed, the MW test is the best test to compare mean scores in my sample. It looks for discrepancies in the two groups' media that are induced by the explanatory variables. The MW value reflects the number of times in the ranking that findings from one party precede those from the other.

Graphical testing of non-normality

Kernel plots for the Dictator game for the whole sample, the two treatments, and the four groups are shown in the graphs below. The plots depict the non-normality of the distributions derived from the Dictator game's sample of amounts sent. Figure 1 below shows that, when compared with the average, the distributions of my outcome variables in the three groups do not generate a smooth line. The kernel plots of my outcome variables show that the distributions are distinctly skewed to the right for all three group categories, and are not normal.

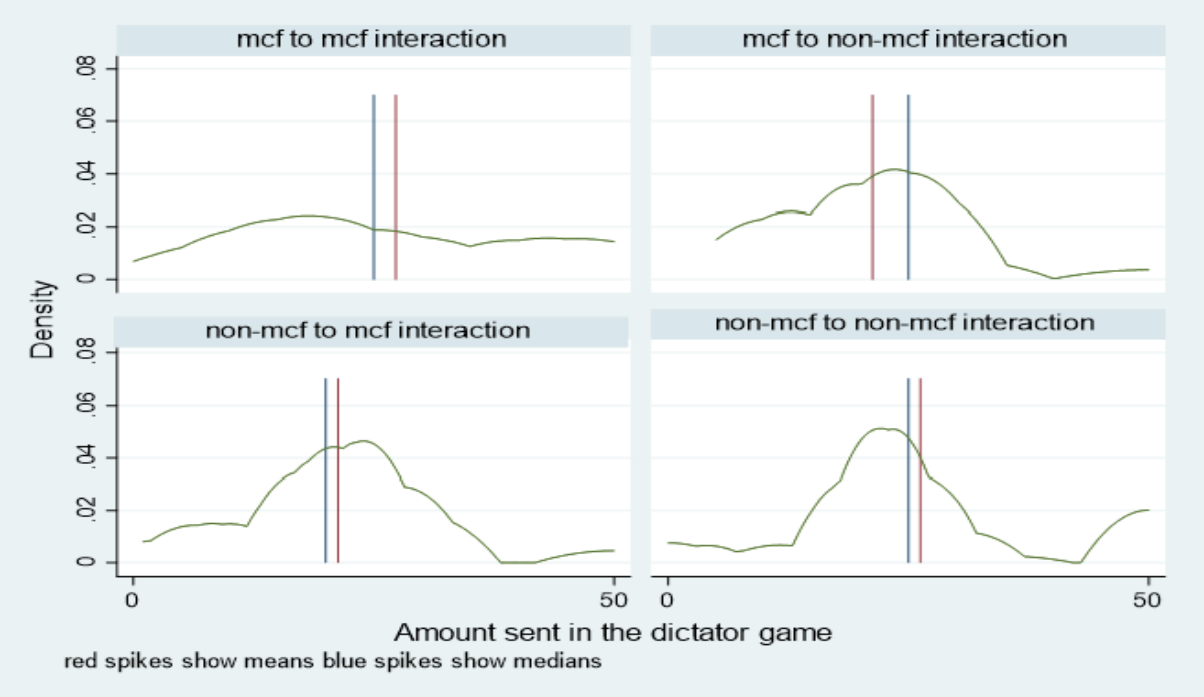
Figure 1: Amounts sent in the Dictator game for the MCF, non-MCF and whole sample



Source: Experimental data collected by the Author

Figure 2 below displays kernel density plots for the relationships of the four treatment groups on interactions that comprise: mcf to mcf, mcf to non-mcf, non-mcf to mcf, and non-mcf to non-mcf. The outcome variables for the four relationships in my study are shown in all four graphs. The distributions for mcf to mcf, non-mcf to mcf, and non-mcf to non-mcf interactions are skewed to the left, while the distribution for mcf to non-mcf interactions is skewed to the right. This demonstrates that my outcome variables in the interaction categories are non-normal.

Figure 2: Four treatment groups on Interactions



Source: Experimental data collected by the Author

Survey tool

Participant consent

You are invited to participate in a web-based online survey about decision making. This is a research project being conducted by **Eric Muhulu Chikwalila**, a MSc. student from the department of Agricultural Economics, Extension and Rural Development, faculty of Natural and Agricultural Sciences, University of Pretoria.

Participation

The survey should take approximately 45 minutes to complete. Your participation in this survey is voluntary. You may refuse to take part in the research or exit the survey at any time without penalty. You are free to decline to answer any question you do not wish to answer for any reason.

Benefits

You will receive a show up fee of 50 Rands worth of airtime plus additional Rands that you are can win from participating in the games in this survey.

Risks

The possible risks or discomforts of the study are minimal. You may express your discomfort at any time as you answer the survey questions.

Confidentiality

Your survey answers will be sent to a link on Heroku Hub where data will be stored in a password protected electronic format. We will ask for your South African cell number for sending the rewards via e-wallet after the survey. The survey will not collect identifying information such as your name, email address, or IP address. Therefore, your responses will remain anonymous. No one will be able to identify you or your answers, and no one will know whether you participated in the study or not. No identifying information would be included in any publications or presentations based on these data, and your responses to this survey will remain confidential.

Contact Information

If you have questions at any time about the study or the procedures, you may contact the research supervisors:

- **Prof Eric Mungatana via phone at 0785238127, Email at eric.mungatana@up.ac.za**
- Dr Damien Jourdain via phone at 0798000163, Email at damien.jourdain@cirad.fr
- Prof Stefano Farolfi Email at stefano.farolfi@cirad.fr
- Prof Marc Willinger Email at marc.willinger@umontpellier.fr

If you feel you have not been treated according to the descriptions in this form, or that your rights as a participant in research have not been honoured during the course of this survey, or you have any questions, concerns, or complaints that you wish to address to someone other than the investigator, you may contact the Head of the Department of Agricultural Economics, Extension and Rural Development, faculty of Natural and Agricultural Sciences, **Prof Sheryl Hendriks , Email: sheryl.hendriks@up.ac.za**.

Electronic consent:

Please select your choice below. You may print a copy of this consent form for your records. Clicking on the "Yes" button indicates that you have read the above information and you voluntarily agree to participate.

Do you accept to participate in this study?

1. Yes
2. No

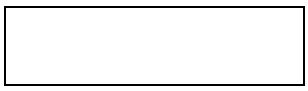
Consent Feedback

Thank you for consenting to participate in this study. Before proceeding to the experiments, please give us a valid South African cell number where we will send your rewards in the form of e-wallet at the end of this survey. Please carefully check the number you are keying in (We expect 10 digits cell phone number)

Which South African network provider do you use?

1. Telkom
2. Vodacom

3. MTN



Part 1: The Experiments

Welcome

Dear participant, thank you for agreeing to take part in this online survey. Upon completion of this survey, you will receive a show up fee of 50 Rands. The survey will be divided into three parts. During the first part, you will participate in 4 experiments in which you will have to answer simple questions and that will give you the opportunity to earn extra Rands depending on the choices you will make. There is no right or wrong answer, just choose what you prefer. In experiment 1 to 3, you will play a game with other persons, while in experiment 4 you will play alone. You play anonymously, which means that when you play with other persons, you will never know their identities. Similarly, your identity will not be revealed to the persons with whom you play. In experiment 1 to 3, your gain will depend on the choices you will make and the choices of other players. At the end of the session, one of the four experiments will be randomly selected to be rewarded. You will get the amount of Rands that you won for the selected game only, not for the other ones. However, you cannot know before the end of the session which one of the four experiments will be the one for which you will be rewarded. The system will randomly select the game that will be paid for real Rands. For this reason, to maximise your satisfaction with your reward, you should make each choice as if it is the one to be paid for real Rands. The cash will be sent to the mobile number that you will share with us via an e-wallet. During the second part, you will be requested to answer questions about you and your relations with others. During the third part, we will ask you more details about your socio-demographic profile. We anticipate the survey to last 45 minutes.

Part 1 Experiments

Experiment 1

MCF to MCF

You were matched online randomly and anonymously with another person to form a pair. Like you, this person is a member of the group of students who received a Master Card Foundation Scholarship. In each pair, there are two roles: sender and receiver. Before the game starts, each player will learn whether he/she is sender or receiver. The sender initially receives 50 Rands and the receiver initially receives nothing. Sender must decide how many Rands to send to the receiver. He/she can choose any amount from 0 to 50 Rands. The gain of sender is equal to the number of Rands that he/she keeps. The gain of the receiver is equal to the number of Rands that he/she receives from the sender.

You are the sender in your pair. Like you, this person is a member of a group of students who received a Mastercard Foundation scholarship. Please select how much of the R50.00 you would like to send to the receiver?

MCF to NON-MCF

You were matched online randomly and anonymously with another person to form a pair. Unlike you, this person is not a member of the group of students who received a Master Card Foundation Scholarship. In each pair, there are two roles: sender and receiver. Before the game starts, each player will learn whether he/she is sender or receiver. The sender initially receives 50 Rands and the receiver initially receives nothing. Sender must decide how many Rands to send to the receiver. He/she can choose any amount from 0 to 50 Rands. The gain of sender is equal to the number of Rands that he/she keeps. The gain of the receiver is equal to the number of Rands that he/she receives from the sender.

You are the sender in your pair. Unlike you, the receiver is not a member of a group of students who received a Mastercard Foundation scholarship. Please select how much of the R50.00 you would like to send to the receiver?

NON-MCF to MCF

You were matched online randomly and anonymously with another person to form a pair. Unlike you, this person is a member of the group of students who received a Master Card Foundation Scholarship. In each pair, there are two roles: sender and receiver. Before the game starts, each player will learn whether he/she is sender or receiver. The sender initially receives 50 Rands and the receiver initially receives nothing. Sender must decide how many Rands to

send to the receiver. He/she can choose any amount from 0 to 50 Rands. The gain of sender is equal to the number of Rands that he/she keeps. The gain of the receiver is equal to the number of Rands that he/she receives from the sender.

You are the sender in your pair. Unlike you, the receiver is a member of a group of students who received a Mastercard Foundation scholarship. Please select how much of the R50.00 you would like to send to the receiver?

NON-MCF to NON-MCF

You were matched online randomly and anonymously with another person to form a pair. Like you, this person is not a member of the group of students who received a Master Card Foundation Scholarship. In each pair, there are two roles: sender and receiver. Before the game starts, each player will learn whether he/she is sender or receiver. The sender initially receives 50 Rands and the receiver initially receives nothing. Sender must decide how many Rands to send to the receiver. He/she can choose any amount from 0 to 50 Rands. The gain of sender is equal to the number of Rands that he/she keeps. The gain of the receiver is equal to the number of Rands that he/she receives from the sender.

You are the sender in your pair. Like you, this person is not a member of a group of students who received a Mastercard Foundation scholarship. Please select how much of the R50.00 you would like to send to the receiver?

Experiment 2

For this experiment, you are matched randomly and anonymously with another participant on this online platform to form a pair. One of you will be selected at random to be sender; the other will be receiver. You will learn whether you are the sender or receiver prior to making any decision. To start, both the sender and the receiver receive **R50.00**. This game has two steps:

Step 1: The sender must decide how many Rands to send to the receiver. He/she can choose to send any amount between **0** and **50** Rands. The amount sent by the sender will be multiplied by **3** so that the receiver will receive triple the amount.

Example 1: The sender sends **0** Rands, the receiver receives **0** Rands.

Example 2: The sender sends **5** Rands, the receiver receives **15** Rands.

Example 3: The sender sends **50** Rands, the receiver receives **150** Rands, and so on.

Step 2: If the receiver receives Rands from the sender, the receiver must decide how many Rands to return to the sender. He can choose any amount between zero and the amount that he/she received from the sender after been multiplied by **3**.

Example 1: The sender sent 5 Rands and the receiver received **15** Rands. How much does the receiver return from the **15** Rands received?

Example 2: The sender sent 15 Rands and the receiver received **45** Rands. How much does the receiver return from the **45** Rands received?

Example 3: The sender sent 45 Rands and the receiver received **135** Rands. How much does the receiver return from the **135** Rands received and so on.

Once paired with another participant, you will play both roles. You will be first asked how much you want to send to the receiver. You will then know how much the other participant had sent to you and will need to choose how much you want to send back. The computer will then select which of the scenario will be used for the payment if this experiment is used for the final payment. You will then be asked to fill a table with hypothetical scenarios of people sending you money, and you will be asked to state how much you want to send back for each of the scenarios.

MCF to MCF

Senders decision

In this task 1, you have been selected as the sender. You have R50.00 Rands. Like you, the receiver is a member of the group of students who received a Master Card Foundation scholarship. How much will you send to the receiver, knowing that he will receive 3 times the amount you sent and will eventually sent back some money to you after that? Please select the amount (between 0 and R50.00 Rands) that you would like to send:

MCF to NON-MCF

Senders decision

In this task 1, you have been selected as the sender. You have R50.00 Rands. Unlike you, the receiver is not a member of the group of students who received a Master Card Foundation scholarship. How much will you send to the receiver, knowing that he will receive 3 times the amount you sent and will eventually sent back some money to you after that? Please select the amount (between 0 and R50.00 Rands) that you would like to send:

NON-MCF to MCF

Senders decision

In this task 1, you have been selected as the sender. You have R50.00 Rands. Unlike you, the receiver is a member of the group of students who received a Master Card Foundation scholarship. How much will you send to the receiver, knowing that he will receive 3 times the amount you sent and will eventually sent back some money to you after that? Please select the amount (between 0 and R50.00 Rands) that you would like to send:

NON-MCF to NON-MCF

Senders decision

In this task 1, you have been selected as the sender. You have R50.00 Rands. Like you, the receiver is not a member of the group of students who received a Master Card Foundation scholarship. How much will you send to the receiver, knowing that he will receive 3 times the amount you sent and will eventually sent back some money to you after that? Please select the amount (between 0 and R50.00 Rands) that you would like to send:

Task 3

MCF TO MCF

Receivers decision

In this task you are the receiver, and you will be proposed scenarios where senders sent you money. Like you, the sender is a member of the group of students who received a Master Card Foundation scholarship. In each case, state the among you want to send back to the sender.

MCF TO NON-MCF

Receivers decision

In this task you are the receiver, and you will be proposed scenarios where senders sent you money. Unlike you, the sender is not a member of the group of students who received a Master Card Foundation scholarship. In each case, state the among you want to send back to the sender.

NON-MCF TO MCF

Receivers decision

In this task you are the receiver, and you will be proposed scenarios where senders sent you money. Unlike you, the sender is a member of the group of students who received a Master Card Foundation scholarship. In each case, state the among you want to send back to the sender.

NON-MCF TO NON-MCF

Receivers decision

In this task you are the receiver, and you will be proposed scenarios where senders sent you money. Like you, the sender is not a member of the group of students who received a Master Card Foundation scholarship. In each case, state the among you want to send back to the sender.

Sender sent	**10**	**20**	**30**	**40**	**50**
You received	**30**	**60**	**90**	**120**	**150**
You decide to send back					

Experiment 3

Instruction

All MCF SCHOLARS

For this task, you are a member of a group of four players. Each member has 50 Rands. All players of this group received a MCF Scholarship. Each member of the group must decide how much to contribute to a group project. You can decide to contribute any amount between 0 and 50 Rands. What you do not contribute to the project is yours to keep. After all members of your group have contributed, we will double the total amount that the group contributed and divide the amount equally between the four members of the group, so that each member gets the same payoff from the project regardless of how much they contributed.

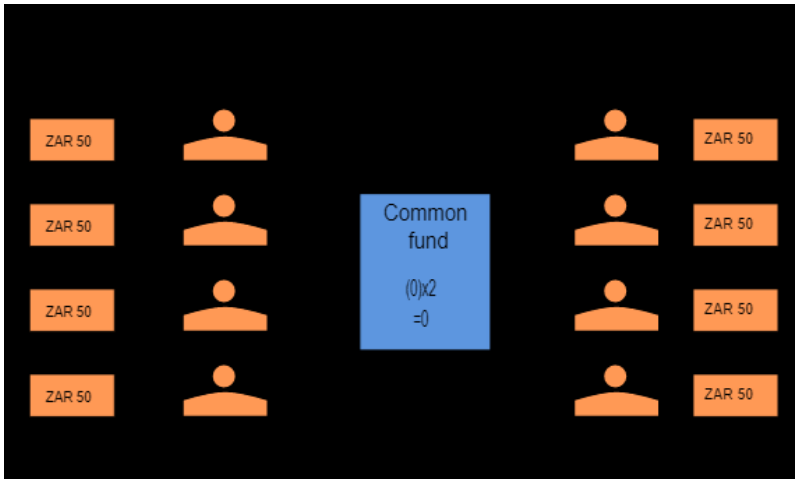
MIXED GROUP

For this task, you are a member of a group of four players. Each member has 50 Rands. In this group, some players received an MCF scholarship and some did not. Each member of the group must decide how much to contribute to a group project. You can decide to contribute any amount between 0 and 50 Rands. What you do not contribute to the project is yours to keep. After all members of your group have contributed, we will double the total amount that the group contributed and divide the amount equally between the four members of the group, so that each member gets the same payoff from the project regardless of how much they contributed.

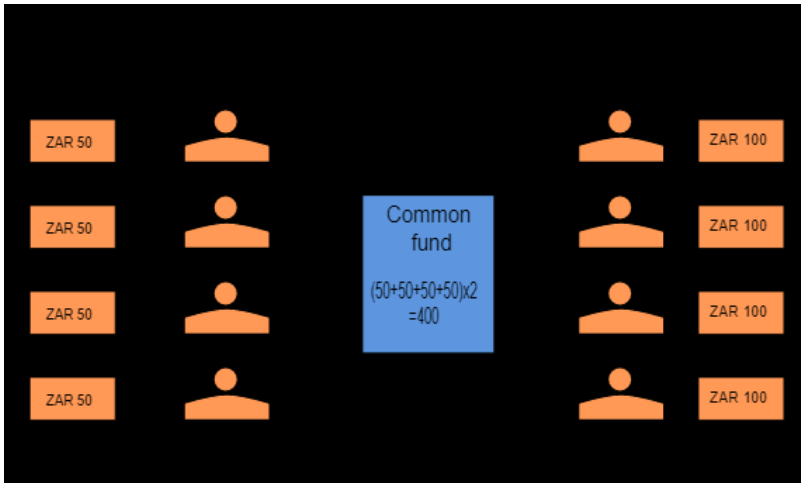
ALL NON-MCF SCHOLARS

For this task, you are a member of a group of four players. Each member has 50 Rands. All players of this group did not receive a MCF Scholarship. Each member of the group must decide how much to contribute to a group project. You can decide to contribute any amount between 0 and 50 Rands. What you do not contribute to the project is yours to keep. After all members of your group have contributed, we will double the total amount that the group contributed and divide the amount equally between the four members of the group, so that each member gets the same payoff from the project regardless of how much they contributed.

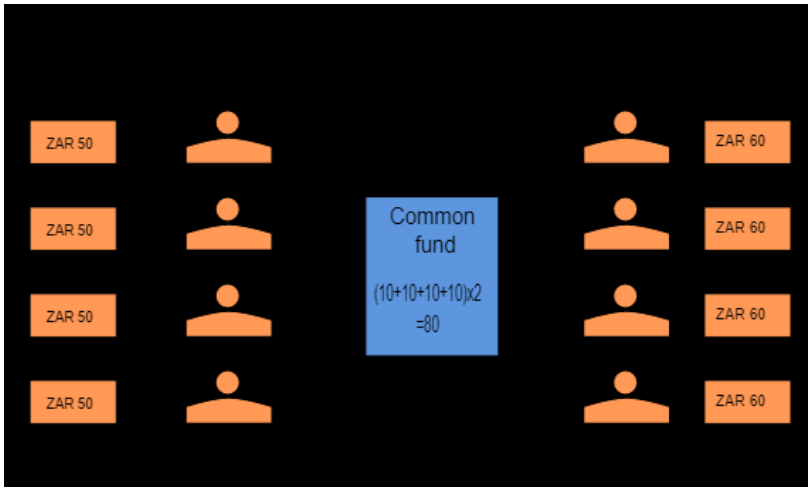
- ***Example 1:*** Nobody contributes to the project. There is nothing to be doubled. Each member of the group gets zero from the project and keeps his 50 Rands.



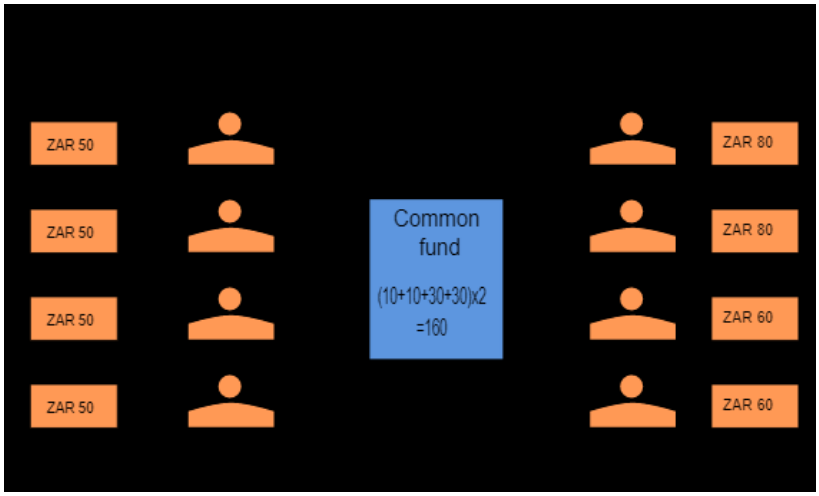
Example 2: Everybody contributes all his 50 Rands to the project. Therefore, the total amount in the project is 200 Rands worth of airtime. We multiply this amount by 2 so that 400 Rands is available for the group. After sharing equally this amount everybody in the group ends up with a payoff of 100 Rands.



Example 3: Everybody contributes 10 Rands to the project. Therefore, the total amount in the project is 40. We multiply this amount by 2 so that 80 Rands is available for the group. After sharing equally this amount everybody in the group gets 20 Rands from the project. In addition to that, you have the 40 Rands that you did not put in the project. Your total payoff of the game is therefore 60 Rands.



Example 4: 2 People contribute 10 Rands and 2 people contribute 30 Rands. The total amount in the project is 80 Rands, which is doubled to give 160 Rands. This is shared equally among the people in the group, such that each gets 40 Rands from the project. The total payoff is therefore 80 Rands (the 40 Rands not contributed + the 40 Rands from the project) for those who contributed 10 Rands and 60 Rands (the 20 Rands not contributed + the 40 Rands from the project) for those who contributed 30 Rands.



All MCF SCHOLARS

You are a member of a group of 4 players. Each member has **50** Rands. All members of this group received an MCF scholarship. When all members have made their contribution, the total

amount contributed will be doubled. The doubled amount will be divided equally between the group members regardless on how much each contributed. How much do you want to contribute?

MIXED GROUP

You are a member of a group of 4 players. Each member has **50** Rands. In this group, some players received an MCF scholarship and some did not. When all members have made their contribution, the total amount contributed will be doubled. The doubled amount will be divided equally between the group members regardless of how much each contributed. How much do you want to contribute?

ALL NON-MCF SCHOLARS

You are a member of a group of 4 players. Each member has **50** Rands. All members of this group did not receive an MCF scholarship. When all members have made their contribution, the total amount contributed will be doubled. The doubled amount will be divided equally between the group members regardless of how much each contributed. How much do you want to contribute?

Experiment 4

In the following, you will see a 10x10-matrix containing 100 boxes on your screen. You can choose the number of boxes you want to open. To do this, you can directly type the number of box you want to collect or use the arrows (up and down) to increase/decrease the number of boxes you want to open. Once opened, the box marked by a tick symbol. For each box collected you earn R1.00.

Behind one of the boxes hides a bomb that destroys everything that has been opened. The remaining 99 boxes are worth R1.00 each. The Bomb has been planted randomly by the

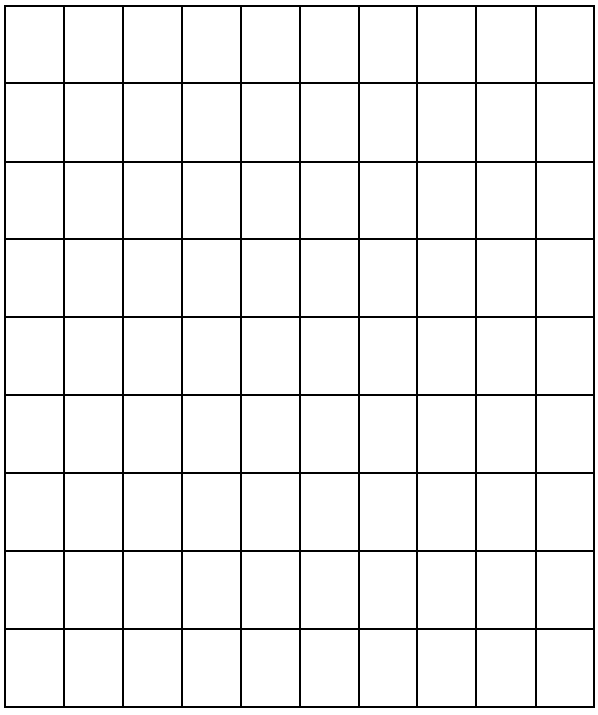
computer and you do not know where the bomb is located. You only know that the bomb can be in any place with equal probability. Your task is to choose the number of boxes you want to open. When you are satisfied with your choice, you hit the 'Stop' button. The content of the boxes will be revealed when you hit the 'Solve' button. A dollar sign or a fire symbol (for the bomb) will be shown on each of your opened boxes.

- If you opened the box where the bomb is located, the bomb will explode. All your earnings in this task will be destroyed and your payoff will be R0.00.
- If your opened boxes did not contain the bomb, you will receive R1.00 for each of the boxes you collected.

Example 1: You choose to open 30 cells. The bomb is not in the 30 cells opened by the computer. You will win 30 Rands worth of airtime.

Example 2: you choose to open 10 cells. If the bomb is among the 10 cells opened by the computer. You will win 0 Rands worth of airtime.

How many cells do you want to open? ☐



Part 2 Questions on you and your relations

1. (For MCF Scholar only) Before joining MCF, were you a member of another scholarship program or group that engaged its members to participate in different activities?
   - ☐ Yes
   - ☐ No
2. a. On campus, do you belong to any formal or informal group? Group can be e.g. Academic and educational, Political & culture, Recreation & sports, Religious, Student government, Community service etc.
   - ☐ Yes
   - ☐ No

2b. Please choose the type of group you feel most associated with

- ☐ Academic and educational
- ☐ Political
- ☐ Recreation & sports
- ☐ Student government
- ☐ Community service
- ☐ Cultural
- ☐ Ethnic or linguistic
- ☐ Religious
- ☐ Other specify

3. Thinking about the group you most identify with:
   Does your group work with or interact with other groups within the campus?
   - ☐ No
   - ☐ Yes, Occasionally
   - ☐ Yes, Frequently
4. Thinking about the group you most identify with:
   Can you easily make new friends in your group?

- ☐ Yes
- ☐ No

5. Thinking about the group you most identify with:

   About how many close friends do you have in your group? These are people you feel at ease with, can talk to about private matters, or call on for help.

   - ☐ 0
   - ☐ 1
   - ☐ 2
   - ☐ 3
   - ☐ 4
   - ☐ 5
   - ☐ More than 5

6. Thinking about the group you most identify with:

   If you suddenly needed to borrow a small amount of money, are there people in your group to whom you could turn and who would be willing and able to provide this money?

   - ☐ Yes
   - ☐ No

7. There are often differences in characteristics between students on campus in different groups. For example, differences in wealth, income, social status, ethnic or linguistic background/race/caste/tribe. There can also be differences in religious or political beliefs, or there can be differences due to age or sex. To what extent do such differences characterize your group? Answer using the five-point scale below where.

   1. Very few such differences exist in my group
   2. Few such differences exist in my group
   3. Neither many nor few differences exist in my group
   4. Many such differences exist in my group
   5. Very many such differences exist in my group.

8. Do any of these differences' hinder interactions with one another in your group?

   - ☐ Yes
   - ☐ No

9. Which differences hinder interactions within your group? (two answers possible)

   1. Differences in the level of education

2. Differences in wealth/material possessions
3. Differences in social status
4. Differences between genders.
5. Differences between younger and older scholars
6. Differences in political party affiliations
7. Differences in religious beliefs
8. Differences in ethnic or linguistic background/ race/caste/tribe

10. Thinking about the group you most identify with:

    How often have you communicated in the past month with people in your group via online platform e.g. zoom, google meet, WhatsApp call/video call and other related mediums?

    1. 0 times
    2. Once
    3. Twice
    4. 3-5 times
    5. More than 5 times

11. How do you see yourself? Are you generally a person who is fully willing to take risks or do you try to avoid taking risks? Please tick a box on the scale below, where 0 means 'risk averse/try to avoid taking risks' and 10 means 'fully prepared to take risks':

    0 1 2 3 4 5 6 7 8 9 10

12. People can behave differently in different situations. How would you rate your willingness to take risks in the following areas? How is it ... Rate on a scale from 0 to 10

    a. While driving
    b. In financial matters
    c. During leisure and sport
    d. In your occupation
    e. With other people
    f. Your faith in other people

13. As a general rule, would you say that most people can be trusted, or that you can never be too careful in your dealings with people? Could you rank yourself on a scale from 0 to 10, where 0 means "You can't be too careful" and 10 means "Most people can be trusted".

    0 1 2 3 4 5 6 7 8 9 10

14. Could you rank yourself on a scale from 0 to 10, where 0 means "being very careful in your relationships with other people" and 10 means "being very confident in relationships with others".
    a. In general
    b. With family
    c. With other students

15. Thinking about the group you most identify with, please rate the following statements.

1. Disagree strongly
2. Disagree somewhat
3. Neither agree nor disagree
4. Agree somewhat
5. Agree strongly
    a. "Most people who are in your group can be generally trusted".
    b. "In this group, one must be alert, or someone is likely to take advantage of you".
    c. "Most people in this group are willing to help if you need it".
    d. "In this group, people generally do not trust each other in matters of lending and borrowing money".

16. How much do you trust people in your group?
    1. I do not trust them.
    2. I have minimal trust for them
    3. I have moderate trust for them
    4. I have high trust for them
    5. I have very high trust for them

17. Thinking about yourself, please rate the following statements.

1. Disagree strongly
2. Disagree somewhat
3. Neither agree nor disagree
4. Agree somewhat
5. Agree strongly
    a. “If someone does me a favour, I am prepared to return it;”
    b. “If somebody puts me in a difficult position, I will do the same to him/her”.
    c. “I go out of my way to help somebody who has been kind to me before”.
    d. “I am ready to undergo personal costs to help somebody who helped me before”

18. How well do people in your group help each other out during these days, under the covid-19 pandemic?

1. People are never helping
2. People rarely helping
3. People help sometimes
4. People help most of time
5. People are always helping

19. In the past 5 months did you voluntarily participate in any activity within or outside your group, in which you assisted with something for the benefit of others? E.g. mentoring, tutoring, counselling, or donations.

- ☐ 0 times
- ☐ Once
- ☐ Twice
- ☐ 3-5 times
- ☐ More than 5 times

20. Thinking about the group you most identify with:

Are people in your group willing to cooperate and come together to work for a common purpose? For example, working voluntarily for a community orphanage or when there is a problem in your group.

1. People are very unlikely to cooperate
2. People are somewhat unlikely to cooperate
3. People neither likely nor unlikely to cooperate
4. People are somewhat likely to cooperate
5. People are very likely to cooperate

21. If a campus project does not directly benefit you but has benefits for many others on campus, would you contribute time to the project?
    1. Will not contribute time
    2. Will contribute time
22. If a campus project does not directly benefit you but has benefits for many others on campus, would you contribute money/material things to the project?
    1. Will not contribute money/material things
    2. Will contribute money/material things

Part 3 socio-demographics

23. What is your age?

    ☐

24. What gender do you identify as?
    - ☐ Male
    - ☐ Female
    - ☐ Other
    - ☐ Prefer not to answer
25. Please specify your ethnicity.
    - ☐ Black
    - ☐ Coloured
    - ☐ White
    - ☐ Indian/Asian

- ☐ Other
- ☐ Prefer not to say

26. What is your country of origin?

27. Please specify the description of the society you come from in your country of origin.

- ☐ Rural
- ☐ Semi-urban
- ☐ Urban

28. What is the size of your parental family?

29. What is your level of study?

- ☐ Undergraduate
- ☐ Honours
- ☐ Masters
- ☐ PhD or higher

30. What is your marital status?

- ☐ single
- ☐ married
- ☐ divorced
- ☐ widowed/widower
- ☐ separate/entanglement
- ☐ cohabiting
- ☐ Prefer not to say

31. Do you participate in the national elections of your country? E.g. taking part in voting for new leaders.

- ☐ Yes

☐ No

32. How would you describe your political view?

- ☐ Very conservative
- ☐ Slightly conservative
- ☐ Slightly liberal
- ☐ Very liberal
- ☐ Prefer not to say

33. If applicable, please specify your religion.

- ☐ Christianity
- ☐ Judaism
- ☐ Islam
- ☐ Buddhism,
- ☐ Hinduism
- ☐ Other
- ☐ None
- ☐ Prefer not to say

Thank you for taking the time to participate. We will now proceed to the selection of the game that will be used to calculate your reward.