Experiments on Identity, Theft and Mitigation Strategies

A DISSERTATION
SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL
OF THE UNIVERSITY OF MINNESOTA
BY

Clinton Joseph Pecenka

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

Paul Glewwe and Terrance Hurley, Advisers

June 2011

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

To simplify and structure arguments, economists have developed effective strategies to explain the actions of agents within an economy. As with any representation, simplifications ensure practicality. They guarantee a model is widely relevant but can also trivialize essential components in specific applications. A key component of economic analyses is the assumption that individuals use their resources to maximize their own utility. Too often, material consumption becomes utility's singular component rather than one, albeit important, factor. A view of utility as material consumption is an important and useful simplification. It can, however, obfuscate solutions to policy problems. In addition to material consumption, there are other factors that influence utility. Of particular interest in this work are the roles played by racial identity, inequality, the welfare of one's neighbors and the relationship one has with the members of one's community. Some of these factors help explain why individuals contribute to public goods at their own material expense, maintain common resources, reciprocate kindness and act altruistically or spitefully. In essence, this work examines how identity and concern for others influence decision making. These factors are rarely included in economic models of decision making, but are shown to be important in the experiments discussed in this work.

Identity can be examined from a variety of angles. In this work the focus is on how an individual's identity influences how others respond to this person. This work

also examines a specific policy challenge in a particular cultural and geographic context. Although this context is specific, the factors that are shown to influence decision making in this work are applicable to a wide range of additional policy challenges. The public goods and common resources examples mentioned above are just two separate challenges that have received broad attention. Other areas where identity potentially influences outcomes includes corruption, charitable contributions, labor relationships and tax policy, to name just a few.

The policy challenge that motivates this work is theft. In particular, this work is inspired by a South African university administrator's efforts to mitigate theft from agricultural research lands. Theft was so severe that the land had become effectively unusable for research purposes. Selling the land would have been difficult as any new owner would face similar obstacles. To confront this challenge, the administrator was able to build relationships with individuals in the communities surrounding these research lands. A key component in building these relationships was offering communities a stake in the success of the research farm. As an incentive to limit theft, communities were offered agricultural training and production. These "gifts" not only provided a material benefit to communities, they also facilitated improved relationships with the university and revived an unproductive university asset. This anecdote suggests that establishing relationships between competing individuals can improve economic efficiency. The experiments inspired by this situation delve deeper into factors that exacerbate theft in South Africa and examine several strategies for mitigation, including relationship building through gift-giving. From a North American perspective, theft, and more

specifically livestock theft, may not be cited as major policy challenges. In South Africa, however, theft and crime more generally are viewed as major obstacles to economic growth and development. Due to its apartheid history, South Africa also provides an ideal setting to understand how race, ethnicity, inequality and a regard for others influence decision making.

This work discusses a set of experiments conducted with university students in South Africa. Although the design, implementation and objectives of each of the experiments differ, as discussed in detail in the following chapters, a general overview of how the experiments were conducted is provided below. The experiments were implemented in July and August of 2010 at the University of the Free State. Approximately 360 students participated. Students were recruited from two distinct campuses of the University of the Free State. The primary role of the students from the Bloemfontein campus was to serve as a receiver in a reframed dictator game. In effect, these students received an endowment and were then paired with students from the Qwaqwa campus. The participants from the Qwaqwa campus then had the opportunity to take from the endowment of the Bloemfontein participants under a series of different scenarios. These scenarios varied slightly with the objective of each experiment. One experiment focuses on the racial identity of a theft victim and an individual's willingness to take. A second experiment seeks to determine how individuals respond when taking is more detrimental to the individual losing resources. The third experiment determines how individuals alter taking behavior after receiving a resource transfer from the

potential victim. A brief description of the questions each experiment seeks to answer

and its results are below.

Experiment 1 – Theft, Racial Identity and Inequality

The objective of this experiment is to determine whether the racial identity of a theft

victim or the level of inequality between the thief and the victim influences theft

decisions. In this experiment, a dictator (or taker) can take money from the endowment a

receiver (or victim) earned. The money vulnerable to theft is constant across groups, and

there is no threat of punishment. Any differential in the amount taken is due to

considerations of the racial identity of the potential victim or to variation in receiver

endowments. The results provide only weak evidence that theft is impacted by

inequality. However, racial identity significantly influences theft decisions. Contrary to

expectations, black participants on average take 15 percent more from other black

participants. Black participants with a high endowment were most vulnerable to theft,

while white participants with a low endowment were least vulnerable.

Experiment 2 – Theft and Other Regarding Preferences

The objective of this experiment is to determine how individuals respond to variation in

how "stealing" influences a theft victim. In a taking game, individuals are first able to

take resources from another player when the gain to the taker is accompanied by an

equivalent loss to the victim. A second treatment increases the cost of taking so that the

victim loses double the resources gained by the taker. In response to the increased cost of

4

taking, takers choose to reduce the amount they take by approximately 10 percent. Although the increased costs are borne only by the victim, takers respond to this social information by reducing the amount they choose to appropriate. This result suggests that selfish actions in the lab can be mitigated by providing decision makers with information concerning how these actions impact others.

Experiment 3 – Theft Mitigation through Gift-Giving

The objectives of this experiment are multiple. This experiment seeks to determine whether: (1) individuals alter taking behavior in response to a resource transfer from the potential victim; (2) the size of the resource transfer influences behavior; and (3) the framing of the resource transfer alters decision making. In the taking game, individuals are first given the opportunity to take resources from another player in a baseline game. Players are then re-matched and given the opportunity to take *after* a resource transfer from the potential victim. Any positive transfer significantly reduces the amount taken. "Small" transfers reduce a victim's total losses including the transfer and the subsequent "theft". Larger transfers increase a victim's total losses. In contrast, this study failed to find that differences in the frame of a transfer (i.e. whether framed as a gift, as a bribe or as a payment) influenced a taker's response to the transfer.

The results of these experiments provide further evidence that identity, the welfare of others, and one's relationship with other individuals influence behavior. Material payoffs certainly remain an important factor in decision making, but they are not the only influence. The rest of this dissertation is structured as follows. Chapters two

through four each discuss one of the three experiments outlined above. Chapter five

provides a summary, conclusion and presents recommendations for future research.

CHAPTER 2

THEFT, RACIAL IDENTITY AND INEQUALITY

2.1   INTRODUCTION

The interaction of social and economic factors has received considerable attention in

economics (e.g. Akerlof and Kranton, 2000). Identity, and how it commonly impacts

decision making and economic outcomes, is an important strand of this research.

Experimental work has demonstrated that race and ethnicity can lead to differential

treatment both in labor markets and laboratory environments (e.g. Bertrand and

Mullainathan, 2004; Fershtam and Gneezy, 2001). In a similar vein of research, Knack

and Keefer (1997) found that trust and civic norms are more prevalent in ethnically

homogenous nations with high and relatively equal incomes. Diverse study locations and

cross-country analyses suggest that the interaction of identity and social capital is a

worldwide phenomenon rather than an issue restricted to any one region. Although

identity and social capital are influential worldwide, Alesina and La Ferrara (2002)

demonstrated that low trust is associated with previous discrimination, lack of economic

success, as well as inequality and racial heterogeneity. In South Africa, the location of

this study, these issues remain salient.

South Africa is a land of contrasts, often promoted as "the world in one country".

This slogan fits well due to the variety of its landscapes and wildlife, diverse people and

cultures, extreme income inequality as well as the significance of apartheid and the

transition to the post-apartheid era. Despite the progress being made to address the racial

and economic inequities of the past, South Africa remains one of the most economically divided countries in the world, with poverty historically concentrated among the black population.[1] In addition, crime is widely viewed as one of the most difficult challenges facing the country. These characteristics make South Africa an ideal place to investigate the role of identity and economic decision making related to theft.

Previous research has examined the interactions of social distance and economic decision making. The work most similar to this research utilized the dictator game developed by Forsythe et al. (1994) or the trust game developed by Berg, Dickhaut and McCabe (1995).[2] In the dictator game, a player proposes a division of a resource between himself or herself and another player. The second player only acts as a receiver and accepts whatever division is allotted by the proposer. A non-selfish division is often interpreted as evidence of preferences for fairness or altruism. In the trust game, an investor has the opportunity to invest money with another player, the trustee. If an investment is made, the investment is typically tripled and then given to the trustee. The trustee then decides how much of the tripled investment to return to the investor. Trust is measured by the amount of money that an investor is willing to pass to the trustee. Trustworthiness is measured by how much of the investment is returned to the investor.

Van Der Merwe and Burns (2008) used a dictator game with university students in South Africa where the race of the partner was conveyed via surname. They found that white proposers made significantly lower offers to black partners than to whites;

---

[1] According to the World Bank, South Africa's 2000 Gini Index was 0.58. A 2005-2006 estimate by Statistics South Africa estimates a Gini coefficient of 0.73. According to the South African Regional Poverty Network, Gini coefficients are rising over time within racial groups.
[2] Kahneman, Knetsch and Thaler (1986) were the first to publish a hypothetical dictator game experiment.

however, black proposers did not display significant differential treatment based on the race of the partner. In similar work, Burns (2004) conducted a dictator game with South African high school students where a partner's race was conveyed via a photograph. Interestingly, the author noted that these subjects were part of the more integrated schooling environment instituted after the end of apartheid. In this study, although both black and white proposers on average offered more to their own racial group, differences were both small and insignificant.

Trust games offer similar insights regarding social distance and decision making in South Africa. Burns (2006) used high school students as subjects and conveyed identity with photographs. Burns found that blacks are trusted less as trustees, even by black proposers. However, once trust was given, there was no significant difference in the amount returned to proposers by black trustees. In recognition of the potential confounding influence of income inequality, Haile, Sadrieh and Verbon (2008) conducted a trust game with university students. To determine the impact of both inequality and race, they provided information on both the partner's race and perceived income level to each subject. Although no significant differential treatment was detected based solely on race or solely on inequality, low-income participants invested significantly less when paired with a partner that differed in both the income and racial dimension.

The results of these studies paint a complicated but uncertain picture of social and economic conditions in South Africa.[3] While some research indicates that discrimination could be a factor in economic decision making, other work suggests the existence of only

___

[3] For additional work on social capital and trust in South Africa see Carter and Castillo (2003) and Ashraf, Bohnet and Piankov (2003).

small and insignificant treatment differentials based on racial and/or inequality considerations. An additional possibility is that differential treatment based on race or income is context specific. Due to significant concern over crime in South Africa and questions about the role that race and inequality play in competing theories on the causes of crime, it is important to understand the potential for differential treatment in the context of theft.

Demombynes and Özler (2005) investigated the relationship between crime and local inequality in the South African context.[4] They found evidence to support both economic theories (based on expected returns) and sociological theories (based on the lack of social capital, upward mobility, etc.) on the relationship between crime and inequality. They also found racial heterogeneity to be highly correlated with crime. As interesting and important as these results are, obtaining observational data to determine the relationship between race, crime and inequality is a serious challenge. As the authors note, measurement error is a difficult issue in crime research. In their work, they estimated that some crimes were reported in approximately only half of the cases. Moreover, in the crime and inequality literature, social factors are difficult to measure and there is often little choice regarding the geographic unit of analysis. In many cases race is highly correlated with poverty and inequality which decreases the precision of the estimates. Economic experiments, on the other hand, provide researchers more control over the environment and are an especially effective tool when work with observational data is difficult.

---

[4] See Demombynes and Özler (2005) and the references therein for reviews of economic and sociological theories on crime as well as the international literature on the links between inequality and crime.

In the current chapter a reframed dictator game is used to determine the impact of racial identity and inequality on theft. An interesting feature that distinguishes this work from other dictator experiments on race and inequality is that property rights are assigned to the receiving player. The dictator then has the opportunity to take or "steal" money from the receiver.[5] In this design a dictator always has the opportunity to take the same amount of money from another player without risk of punishment. This is important to remove the influences of expected return and risk aversion so that average differences in decision making are caused solely by variation in social information.

The principal result of this work is that the racial identity of the receiver does influence the amount that subjects choose to take from one another. Black proposers are willing to take 15 percent more when paired with a black receiver relative to a white receiver. On the other hand, variation in receiver endowments does not have a significant impact on the amount that dictators choose to take, although high-endowment receivers did suffer more from taking than did their low-endowment peers. Ethnic identity also appears to play a role in decision making, although this result is not statistically significant. If the results related to race, ethnicity and decision making are valid in other contexts; this finding could have substantial implications for economic development in South Africa.

The next section of this chapter discusses the design of the experiment, and the following section presents the results. Section 2.4 provides an analysis of the results, and section 2.5 concludes.

---

[5] Bardsley (2008) uses a dictator game and allows dictators to take rather than give while List (2007) allows both taking and giving. Falk and Fischbacher (2002) and Kimbrough, Smith and Wilson (2010) also explore theft through experiments.

2.2   EXPERIMENT DESIGN

The experimental subjects in the reframed dictator game were 354 students from the

University of the Free State. The University of the Free State is a multi-campus

institution, and the subjects were drawn from two distinct campuses.[6] The main campus

in Bloemfontein is home to a diverse student body, while the Qwaqwa campus is home

almost exclusively to black students. In Bloemfontein, 92 white and 85 black students

were recruited via email to play the role of a receiver. These participants completed their

portion of the experiment online. In Qwaqwa, students were recruited via email,

classroom announcements, signs on campus and student-to-student recruiting. The 177

recruits from the Qwaqwa campus were black students by nature of Qwaqwa's

demographics. These students played the role of the dictator in a classroom or

"laboratory" experiment setting. Each subject was promised a 20 Rand participation

payment and the potential to earn additional money. At the time of the experiment

(August 2010), the exchange rate was approximately 7.3 ZAR = 1 USD. Lunch in the

Qwaqwa campus cafeteria was priced between 13 and 20 Rand.

The purpose of this experiment is to determine the impact of racial identity and

inequality on theft. In order to determine the impact of the "victim's" race in the

reframed dictator game, Bloemfontein players of both races were randomly paired with

Qwaqwa players who were able to take from the Bloemfontein player's endowment. To

create inequality between players in the game, Bloemfontein subjects completed a word

scramble exercise and thus earned an additional payment. They randomly earned either

---

[6] Two distinct campuses were chosen to ensure a substantial Sotho speaking population for a later
experiment. The Qwaqwa campus is located in a region that was designated as the Sotho homeland during
the apartheid era.

30 or 50 Rand for completing this task. The additional payment was described to Qwaqwa participants as earnings to create the sense that the Bloemfontein participants gained the additional payment by completing a task, and so this additional payment was justly their property.[7] Conversely, participants in Qwaqwa did not have the opportunity to earn an additional payment. The intention was to create a sense of inequality of opportunity or perhaps unfairness and entitlement.[8] This randomly assigned additional payment created two levels of inequality (termed high and low) between the Qwaqwa subjects (who began the experiment with a 20 Rand participation payment) and the Bloemfontein subjects (who began the game with a 20 Rand participation payment and an additional payment of 30 or 50 Rand). Table 2.1 summarizes the four distinct groups created to examine the impact of racial identity and inequality on taking.

The experiment began via the online instrument in Bloemfontein. Although Bloemfontein participants played the passive role of the receiver in this game, they participated in the experiment by completing the word scramble task and providing a surname that was then used to convey their racial identity to their partner in Qwaqwa.[9] They also participated in decision-making exercises for use in other associated experiments not discussed here. The decisions of interest in this paper took place during 10 sessions in a classroom reserved for the experiment on the Qwaqwa campus. Qwaqwa

---

[7] Oxoby and Spraggon (2008) varied whether the dictator or receiver earned the resource to be allocated. In cases where the receiver earned wealth, dictators allocated far more resources to the receiver highlighting the importance of property rights. See Hoffman et al. (1994) and Cherry, Frykblom and Shogren (2002) for similar work.
[8] Zitek et al. (2010) used three experiments to show that feeling wronged leads to a sense of entitlement and thus more selfish behavior. This finding supports the hypothesis that racial identity and income inequality exacerbate theft due to South Africa's apartheid past.
[9] See Van Der Merwe and Burns (2008) for a discussion of using surnames to signal racial identity. Their examples of black and white sounding South African names are included in Appendix A.

participants began each session by learning that they had already been randomly paired with another student at a different university campus. They also learned that their decisions involved real money, could impact the player with whom they were paired and would not be known to others.[10] The Qwaqwa players were then reminded of their own participation payment and learned the surname, participation payment and the additional payment of the player with whom they were paired. The exact text presented to participants in the high-inequality treatment is shown in Table 2.2.[11] The low-inequality treatment is identical except for the additional payment paid to student A. After making this decision, the Qwaqwa participants continued to other decisions not relevant to this chapter and then completed a demographic questionnaire.

2.3   RESULTS

This section begins with a brief overview of taking behavior in the experiment. Results are then described by treatment group, and comparisons are made between groups using non-parametric methods. Finally, regression analysis is used to examine additional variables of interest.

In the experiment, the mean amount taken from the receiving player was 10.4 Rand, or 69 percent of the money vulnerable to theft. Similar to most reported results from dictator experiments, subjects in the role of proposers did not act completely selfishly. Nearly 17 percent of participants took less than 5 Rand while 37 percent took

---

[10] Qwaqwa participants played several variations of a dictator-like game. Only the first of these variations is discussed here. Only one randomly selected decision would ultimately impact payments.
[11] See Appendix B for the demographic questions presented to Qwaqwa players.

between 5 and 10 Rand and 46 percent took at least 11 Rand. This information is summarized in Figure 2.1.

Although each of the treatment groups largely followed the same pattern, there are differences when subjects are divided by the race of the receiving player and into high- and low-inequality treatments. There are also differences between groups when both of these factors are considered jointly. These treatments are considered in order below.

In contrast to prior evidence that increased social distance would lead to additional taking, examining the taking data based on the race of the receiver yields a contradictory, or perhaps more nuanced, result. When the receiver was a black student (and thus the same race as the proposer, which is believed to reduce social distance), proposers were less willing to abstain from taking and more willing to take all 15 Rand from the receiver. Figure 2.2 highlights this discrepancy.

Although the amount taken at the intermediate values of [1, 14] are similar regardless of the race of the receiver, 13 percent of dictators were willing to abstain from taking anything when paired with a white receiver compared to only 5 percent who abstained from taking anything when paired with a black receiver. Accordingly, when paired with a black receiver, almost 45 percent of dictators took all 15 vulnerable Rand while less than 37 percent of dictators paired with white receivers acted as selfishly.

Examining the taking data by level of inequality as in Figure 2.3 supports the notion that it is perhaps more palatable to take from one who has more rather than one who has less. When paired with a receiver with a total endowment of 50 Rand, dictators

took one-third or less of the vulnerable endowment in approximately 30 percent of the cases. When other participants were paired with a receiver with a total endowment of 70 Rand, dictators were satisfied with a one-third share of the vulnerable endowment only 13 percent of the time. Viewing this discrepancy at the higher end of the distribution, the high-inequality treatment dictators took at least two-thirds of vulnerable endowment 80 percent of the time. In the low-endowment treatment, this number fell to 70 percent. Although the impact of this treatment is not pronounced, its effect is in the expected direction, meaning that some dictators, whether implicitly or explicitly, likely considered the other players endowment when taking resources from the receiver.

The final figure of this type displays the impact of both treatments. Little new information is contained in this figure, but it affirms the single factor results discussed above. Figure 2.4 shows that it was preferable to take the least from white receivers with low endowments, followed by white receivers with high endowments, black receivers with low endowments and finally black receivers with high endowments. At the other end of the spectrum, this preference was largely maintained.

These figures are useful to understand the basic trends in the data. They do not, however, provide firm evidence that taking is influenced by social considerations such as the race of one's victim or the level of wealth this person possesses. More precise descriptions of the data and formal statistical tests provide stronger evidence. Table 2.3 provides a summary of the data and is discussed in the following paragraphs.

Previous work suggested that increased social distance would lead to additional taking. Examining the taking data based on the race of the receiver yields the opposite

16

result. When the receiver was a black student (and thus the same race as the dictator), proposers took nearly 15 percent more relative to a pairing in which the receiver was a white student (11.1 to 9.7 Rand). A Mann-Whitney U test comparing these distributions yields a p-value of 0.09.[12] Although this value is only marginally significant, it does suggest that race influences participant taking behavior. Interestingly, the impact of race is the opposite of what was hypothesized prior to the experiment.

Examining the inequality factor alone, it appears that proposers were more willing to take from the endowment of receivers who possessed a larger endowment. Proposers were willing to take 11 percent more in the high-inequality treatment (10.9 to 9.8 Rand). However, testing for a difference in distributions between the high- and low-inequality groups using the Mann-Whitney U test yields a p-value of 0.42 meaning the null hypothesis (that the data are from the same distribution) cannot be rejected. Although the visualized data appear to support the notion that it is perhaps more palatable to take from one who has more relative to one who has less, the evidence in support of this idea is not statistically significant.

Patterns in the data remain when both the race and inequality factors are considered jointly. Of the four treatment groups, white recipients in the low-inequality treatment were the least vulnerable to theft. On average, members of this group lost approximately 9.1 Rand, or 61 percent of their vulnerable endowment. The next least vulnerable victims were white recipients in the high-inequality treatment. On average, this group lost 10.4 Rand or 69 percent of their vulnerable endowment. Black recipients

---

[12] The Mann-Whitney U test is commonly used to test for differences between independent samples. It does not assume normality and is often used as an alternative to a two-sample t-test.

in the low-inequality treatment faired similarly, losing on average 10.7 Rand or 71

percent of their vulnerable assets. Finally, the group most susceptible to theft, black

recipients in the high-inequality treatment, lost 11.6 Rand or 77 percent of their

vulnerable assets to theft. The Kruskal-Wallis test was used to test for differences among

these four groups.[13] A p-value of 0.31 was obtained, meaning that any difference

between all four groups is insignificant at conventional thresholds. However, a Mann-

Whitney U test was used to test for a difference between the two most distant groups.

The difference between the white recipients in the low-inequality treatment and black

recipients in the high-inequality treatment was found to be marginally statistically

significant with a p-value of 0.08. This result suggests that social factors do play a role in

taking decisions. In this case, proposers were willing to take over 27% more from black

subjects in the high-endowment treatment relative to white subjects in the low-

endowment treatment. Table 2.4 outlines the results of the statistical tests used in the

non-parametric analysis.

The non-parametric methods suggest that the race of the receiving individual has

some impact on decision making in the experiment. On the other hand, there is little

evidence that inequality between the groups influenced decision making. In the

following paragraphs, regression analysis is used to examine additional factors that can

alter decision making.

Recall that decision makers were asked to decide how much they would like to

take from the receiver on the [0, 15] interval. Because decisions were restricted to this

---

[13] The Kruskal-Wallis test extends the Mann-Whitney U test to three or more independent groups. It does not assume normality and is often used as an alternative to one-way ANOVA.

interval and many outcomes were at the endpoints, tobit models were used to account for both upper and lower censoring. In addition to the treatment variables of primary interest (receiver race and inequality treatment dummies), other variables were included. In order to determine if there is a joint effect related to the race and inequality treatments, a dummy variable was created to capture the joint effect of being paired with a white receiver in the high-inequality treatment. Following previous work (e.g. Van Der Merwe and Burns, 2008; Burns, 2006), variables such as perceived opportunities for one's racial group in the future, the racial composition of one's closest friends, and one's perceived economic well-being relative to others were included. In addition, standard controls such as gender, age and the number of economics courses were utilized as was the level of education achieved by one's parents. As can be seen from the results of regression (1) in Table 2.5, the race and inequality variables are in the direction indicated by the statistics outlined above. In model (1), the *Receiver is white* variable is marginally significant, and the *High-inequality* variable is insignificant.[14] The other variables, with the exception of *Own racial group has fewer opportunities* and *Parent education* are not significant. It is interesting to note that when a dictator believes that his or her racial group has *fewer* opportunities to get ahead, the amount stolen decreases by over two Rand. Higher educational achievement by one's parents also reduces the amount taken. In regression (2), the interaction between a white receiver and high-inequality treatment was eliminated. Dropping the interaction variable, which was highly collinear with the main effects, changed the results little with the exception of lowering the p-value on the *Receiver is white* variable to within standard significance thresholds and moderately

---

[14] Potential reasons the inequality variable is insignificant are presented in the discussion.

reducing its impact on taking. A likelihood ratio test failed to detect a significant

difference in the fit of model (1) and model (2). Thus, model (2) provides stronger

evidence that racial identity does influence taking decisions. Finally, model (3) includes

only the treatment variables, standard controls with some predictive power and highly

significant covariates. The results of model (3) do not markedly differ from the others,

though a likelihood ratio test indicates that the fit of model (2) is significantly better. It

remains curious that black dictators prefer taking from black receivers even though the

social distance between them is likely smaller than between black dictators and white

receivers. In an effort to explain this finding, additional analysis was undertaken to

account for the role of ethnic identity.

In addition to racial diversity within South Africa, ethnic diversity might also play

a role in decision making. Although less known to outsiders, South Africa is home to

many different ethnic groups.[15] Surnames convey information about ethnic identity,

although not as clearly as racial identity. Table 2.6 describes additional models that

include variables to examine the role of the ethnic affiliation of receiver. Model (2) is the

baseline scenario and is again represented in Table 2.6.[16] Model (4) then includes

dummy variables to determine whether the ethnicity of the receiver impacts decision

making for both black and white ethnic groups commonly represented in the experiment.

Model (5) is included to examine the impact of a dictator and receiver sharing a common

ethnicity.

---

[15] South Africa has 11 official languages and additional unofficial languages spoken by different ethnic groups. Study participants represented at least 9 different ethnic groups.
[16] Likelihood ratio tests were unable to detect a significant difference between model (2) and model (4) or model (5).

In model (4), the addition of the major ethnicity dummies provides some evidence that ethnicity does impact decision making. However, these dummy variables are not significant. Their inclusion increases the negative coefficient on *Receiver is white* to nearly negative six, and the p-value slightly increases. Although the evidence is only suggestive, it is interesting to note that black dictators (who favor white receivers overall) favor white, non-Afrikaner receivers even more than white receivers of Afrikaner descent. This is evidenced by the coefficient on *Receiver is Afrikaner* which shows that an Afrikaner receiver should expect to lose nearly four additional Rand of his or her endowment relative to a white, non-Afrikaner peer. Ethnicity also seems to influence decision making when dictators are paired with black receivers. An ethnic Zulu receiver can expect to lose an additional two Rand relative to another black receiver while a Xhosa receiver can expect to lose more than three additional Rand. Conversely, a Sotho receiver can expect to lose approximately one Rand less than other black receivers. This result is not altogether surprising because the experiment takes place in a Sotho speaking region of South Africa. Thus, the role of shared ethnicity is explored in model (5).

In model (5), the ethnicity dummies were removed and a single dummy variable was added to denote that the dictator and receiver are members of the same ethnic group. Although not significant, this coefficient indicates that shared ethnic affiliation reduces taking by more than one and a half Rand. It should be noted that many participants identify themselves as members of multiple ethnic groups. Yet in the experiment, only one last name (presumably indicating one ethnicity) was provided to dictators. This means that some shared ethnic pairings were likely "hidden" from dictators and could not

21

have played a role in their decisions.[17]   However, these ethnic pairings are denoted in the

data. Thus, the effect of adding the shared ethnicity dummy is potentially larger and

more significant than it appears in model (5).[18]   In this model, the coefficient on the

dummy variable indicating the receiver is white becomes more negative and the p-value

falls to 0.03. Beyond the role of race, there is evidence that ethnicity does play a role in

decision making. Ordering the major ethnic groups who participated in the experiment

by vulnerability to theft preserves the result that white receivers are least vulnerable

followed by black receivers. Namely, Non-Afrikaner, white receivers are least

vulnerable followed by Afrikaner receivers. Sotho receivers are the least vulnerable of

the black ethnic groups followed by Zulu receivers and then Xhosa receivers. The role of

ethnicity as well as race and inequality are discussed further below.

4.   DISCUSSION

There are two primary results of this research and a secondary result that deserve

additional discussion. The first is that the race of a receiver plays a role in the reframed

dictator game. Contrary to initial expectations, black dictators were more willing to take

from black receivers. Second, inequality appears to play at most a small role when

dictators decide how much to take. Finally, although evidence is only suggestive, a

receiver's ethnicity appears to influence decision making in the game. In the following

paragraphs, several hypotheses are proposed to explain why black dictators may be more

---

[17] For example, if a receiver in the game identifies themselves as both Sotho and Zulu yet has a Zulu
sounding surname, a Sotho dictator will fail to recognize their shared Sotho identity. These hidden
identities might also have impacted model (4).
[18] Dropping data associated with receivers who indicated multiple ethnic identities did not appreciably
change the results of model (4) or model (5).

willing to take from black receivers and how this might relate to ethnic identity. In addition, an argument is made for why inequality might be more important than this work suggests. Rather than reaching any definitive conclusion, this discussion serves to highlight areas where interesting questions remain.

Previous research using dictator games suggests that social distance considerations would encourage dictators to take more from dissimilar receivers. This experiment suggests that additional social forces are at work, and race is not the only salient indicator of identity in South Africa. One potential explanation for why black dictators would take more from black receivers is a socialization process in which black South Africans were expected to respect and avoid challenging white South Africans, especially during the apartheid era. Another hypothesis is that increased taking from black receivers is due to accepted norms within these communities or expectations of reciprocal behavior. It may be acceptable to "borrow without asking" from other black participants with the understanding that they tacitly accept this behavior. Such norms are not perceived to exist within white communities. An additional hypothesis is that black South Africans may generally view one another as their comparison group. Accordingly, they may be more willing to act to improve their position relative to one another rather than in comparison to white South Africans. Finally, the influence of ethnic or tribal affiliation may work in concert with the explanations mentioned above. Although there is not enough evidence to differentiate among these explanations, they are outlined below along with any evidence from this experiment to support or refute the hypotheses.

The basis for the socialization hypothesis mentioned above is experience and discussions with colleagues in South Africa.[19] A social hierarchy between races once existed and still persists. Social interaction between races is far from universal, and these interactions have not been sufficient to fully erode hierarchies. Many South Africans may still adhere to former societal norms which demand deferential treatment toward whites.[20] If this is true, it may contribute to black dictators' unwillingness to take from white receivers. However, black South Africans who have developed close friendships with members of other racial groups should be less influenced by older social structures. These individuals will have had significant and repeated interactions with members of other racial groups under circumstances that differ from the norms of earlier decades. If the socialization hypothesis is the reason black dictators take less from white receivers, increased social interactions with other races should mitigate the impact of these deferential norms. That is, those with close friends of other races should be less influenced by the racial identity of the receiver. The evidence from the data, although not significant, is consistent with this hypothesis. To test the socialization hypothesis, one would want to compare the absolute difference between the amount taken from white and black receivers by black proposers with friends of a different race relative to the same differential by proposers without friends of a different race. If the difference between the amount taken from white receivers and black receivers is lower in cases where proposers

---

[19] An anonymous African born colleague attended a conference in South Africa after the end of apartheid. After asking questions of white presenters, he was approached during a break and asked to divulge his nationality. He was told that it was clear he was not South African because black South Africans would not ask questions of a white presenter.
[20] Although decisions were anonymous and participants were assured that subjects would not be identified, ingrained fear of retribution from white receivers could also form part of this socialization hypothesis.

have close friends of another race, it would suggest that increased interaction may lead to more equal treatment. Adding an interaction dummy to model (2) provides a simple test of this hypothesis. The interaction dummy indicates a proposer has friends of a different race and is paired with a white receiver. In this model, a positive and significant coefficient on the interaction dummy would indicate that those with friends of another race are less influenced by the race of the receiver. In model (6), the coefficient on this dummy variable is in the direction suggested by the socialization hypothesis but insignificant.[21] A coefficient of 0.88 suggests that the absolute difference between the amount taken from white and black receivers is nearly one Rand lower in cases where proposers are close friends with members of other racial groups. Based on this limited evidence, the data are consistent with the hypothesis that a socialization process in which whites are granted deferential treatment may be the source of less taking from white receivers.[22]

Alternatively, norms and social expectations concerning acceptable resource transfers may explain why black dictators take more from black receivers. As Falk and Fischbacher (2002) and Kimbrough, Smith and Wilson (2010) demonstrated, social interactions and norms that develop during a game can influence how much individuals choose to steal. For example, if one is in an environment where taking from others is the norm, even one predisposed to abstain may participate in taking to compensate oneself

---

[21] The p-value on the interaction dummy is high (0.78). Although approximately one-third of respondents indicated that one of their three closest friends was a member of a different racial group, demographics in the region and the lack of visible social interactions between white students and black students suggest that interracial friendships are not primarily between white students and black students. If true, this likely reduces the size and precision of the estimate and contributes to a high p-value. Full model (6) results are located in Table 2.7.

[22] This evidence is also consistent with the commonly held belief that increased integration mitigates discrimination.

for the property one expects to lose. Similarly, taking could function as a substitute for borrowing with the understanding that others will behave likewise in the future. If these norms or attitudes are more prevalent in black communities in South Africa, this result could be better explained as adhering to different standards of behavior based on the identity of the receiver rather than as a preference for taking from black receivers. It is difficult to find evidence to support or refute this hypothesis. Returning to model (2), and including a dummy variable indicating a participant's family had been a victim of theft, yields a coefficient that is positive, but small and insignificant.[23] Thus, increased prevalence of theft in one's community is not likely a major factor in the experiment. Furthermore, evidence that taking varies by receiver ethnicity for those paired with both black and white ethnic groups weakens the claim that different norms between white and black communities drives the differential treatment by race.

Another hypothesis is that black dictators more readily compare themselves to black receivers rather than white receivers. They may then be more willing to take from a black receiver, perceived to be part of their comparison group, to improve their relative position. For example, if a dictator takes from a member of another group, the dictator becomes relatively better off within his comparison group because his wealth has increased. On the other hand, if a dictator takes from a member of his own comparison group, he is relatively better off within his comparison group because his wealth has increased and another individual within this same group has suffered a decrease in wealth. Other authors with an interest in envy share the belief that envy can vary based on one's comparison group (Grolleau, Mzoughi and Sutan, 2009). Although there is no

---

[23] See Table 2.7 for full model (7) results.

apparent test to determine if envy is the motivating factor behind the differential treatment by race, perhaps envy leads black dictators to react more strongly to a larger endowment received by a black receiver. This impact could be compounded if the receiver is a member of another ethnic group.

Racial and financial disparities are perhaps the most salient divisions in South Africa from a North American or European perspective. This experiment was designed to examine the impact of these factors on taking behavior. However, variation in taking based on the ethnicity of the receiver suggests that other identity types also play a role. Other authors (e.g. Harrison, Price and Bell, 1998; Ben-Ner and Kramer, 2009) have examined multiple levels or types of identities. The results of their work shows that surface-level (demographic) identities are initially important, but over time, or when more information is available, deep-level (attitudinal) identities are more influential on decision making. Interestingly, both racial identity and ethnic group or tribal affiliation are considered demographic identities. As Ben-Ner and Kramer (2009) mention, it is important to determine if one's identity takes precedence over the others or if saliency is context specific. The question of identity and precedence is especially interesting in the South African context as questions of race and ethnicity continue to be pervasive in the post-apartheid years.

This research suggests that inequality is of limited importance for taking decisions. There are several reasons that "limited importance" is perhaps a conservative interpretation. First, other experimental research in South Africa has shown that inequality considerations can influence decisions (e.g. Haile, Sadrieh and Verbon,

2008).[24] Second, this work attempted to identify the impact of inequality of endowment in the game rather than the impact of inequality of wealth in real life. Although the author expected that inequality in the game would stimulate a response representative of real life, one's reaction to inequality in an unfamiliar game is perhaps muted relative to inequality in life. Finally, the size of the inequality used to stimulate a response in the game was possibly too small to detect the expected impact. Recall that dictators were allowed to take from receivers either in a high-inequality situation or a low-inequality situation. The difference between these two treatments was only 20 Rand. This is roughly enough to buy lunch on campus but in hindsight it is hardly enough to generate a statistically significant increase in taking behavior. Detecting an effect from the inequality treatment would have been more likely with a larger differentiation between the low- and high-inequality treatments or with an increased sample size; clearly both changes increase the cost of the experiment.

2.5 CONCLUSION

When South African university students decide how much to take from another person in a reframed dictator game, the identity of this victim influences the decision-making process. The race of this individual plays a prominent role, although in an unexpected direction. Contradicting other work that shows that people prefer to favor those most similar to them, black dictators in this experiment took more from members of their own racial group. Interestingly, there is some evidence to suggest that the ethnic affiliation of

---

[24] The importance of inequality considerations and its impact on decision making is debated. For a sampling of this literature and competing theories see: Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000; Charness and Rabin, 2002; Falk and Fischbacher, 2006 and Falk, Fehr and Fischbacher, 2008.

the receiver influences taking decisions. The impact of inequality in the experiment was

insignificant although it may be muted due to the design of the experiment.

Although few immediate policy conclusions can be drawn from this work, it is

useful to point out that increased parental education is associated with decreased taking.

Policies to promote positive educational outcomes are likely to mitigate the problem.

Importantly, the results presented here demonstrate that identity remains an important

fixture in South African life. Because identity likely influences economic decision

making beyond theft, the potential implications of these results are both far-reaching and

sizeable. Achieving a better understanding of how racial, ethnic and inequality

considerations impact decision making in South Africa is imperative to confront a diverse

set of challenges ranging from health, environmental and labor issues to government

revenue, expenditure and economic development.

Table 2.1 Treatment Groups

Group (# of pairs)	Bloemfontein Participant			Qwaqwa Participant		
	Race	Participation Payment	Additional Payment	Race	Participation Payment	Additional Payment
WRHI[25] (43)	White	20 Rand	50 Rand	Black	20 Rand	0 Rand
WRLI (49)	White	20 Rand	30 Rand	Black	20 Rand	0 Rand
BRHI (40)	Black	20 Rand	50 Rand	Black	20 Rand	0 Rand
BRLI (45)	Black	20 Rand	30 Rand	Black	20 Rand	0 Rand

---

[25] WRHI refers to the White Receiver, High-Inequality treatment. The other groups are similarly identified.

Table 2.2 Participant Question, High-Inequality Treatment

****

Your participation payment is 20 Rand. The student A with whom you are paired will receive a participation payment of 20 Rand. In addition, student A has earned an additional payment of 50 Rand for completing a task. This information is summarized in the table below.

	You	**Student A**
Participation Payment	20 Rand	20 Rand
Additional Payment	0 Rand	50 Rand
Total	**20 Rand**	**70 Rand**

Student A's last name is _____.

It is possible for you to take money from the **additional payment** student A earned for completing a task.
How many Rand do you want to take from the money student A earned?

(Circle your answer below)[26]

0   1   2   3   4   5   6   7   8   9   10   11   12   13   14   15
****

---

[26] Qwaqwa participants could take a maximum of 15 Rand from the player with whom they were paired. A uniform upper limit was imposed so that the potential returns to theft were identical across low- and high-inequality treatments. A limit of 15 Rand was necessary to ensure that at least the 20 Rand participation payment remained in the low-inequality treatment even if a dictator later took all 15 Rand when theft imposed double the penalty on the victim. This treatment is not discussed in this paper.

Table 2.3 Summary of Results by Treatment Group

Treatment Group (# of pairs)	Amount Taken		
	Mean	SD	Mean Percent Taken
All (177)	10.35	5.05	69.00
White Receiver (92)	9.67	5.40	64.47
Black Receiver (85)	11.09	4.55	73.93
Low-Inequality (94)	9.84	5.50	65.60
High-Inequality (83)	10.94	4.45	72.93
WRLI (49)	9.08	5.72	60.53
WRHI (43)	10.35	4.99	69.00
BRLI (45)	10.67	5.17	71.13
BRHI (40)	11.58	3.74	77.20

Table 2.4 Summary of Non-Parametric Tests

Test	Null Hypothesis	p-value
Mann-Whitney U	White Receiver = Black Receiver	0.09
Mann-Whitney U	Low-Inequality Receiver = High-Inequality Receiver	0.41
Kruskal-Wallis	WRLI=WRHI=BRLI=BRHI	0.31
Mann-Whitney U	WRLI=BRHI	0.08

Table 2.5 Econometric Results

Dependent Variable: Amount taken	β	p-value	β	p-value	β	p-value
	SE		SE		SE	
	(1)		(2)		(3)	
Constant	30.43	0.00	29.87	0.00	27.73	0.00
	8.48		8.33		7.11	
Receiver is white	-3.67	0.08	-3.14	0.04	-2.83	0.05
	2.11		1.52		1.44	
High-inequality	0.33	0.88	0.92	0.54	0.95	0.51
	2.19		1.50		1.42	
Receiver is white and high-inequality	1.12	0.71	-	-	-	-
	3.05		-		-	
Own racial group has fewer opportunities[27]	-2.63	0.00	-2.66	0.00	-2.27	0.01
	0.87		0.86		0.81	
Close friends w/ person of another race	-0.11	0.94	-0.10	0.95	-	-
	1.56		1.56		-	
Perceived economic situation[28]	-0.11	0.93	-0.13	0.92	-	-
	1.33		1.33		-	
Parent education[29]	-0.91	0.06	-0.87	0.06	-0.94	0.03
	0.48		0.47		0.44	
Male	-1.14	0.47	-1.14	0.46	-1.25	0.39
	1.56		1.56		1.46	
Age	-0.35	0.29	-0.34	0.30	-0.29	0.35
	0.33		0.33		0.31	
Number of economics courses	-0.05	0.94	-0.06	0.93	-	-
	0.62		0.62		-	
N	166		166		173	

---

[27] Respondents chose one of *Strongly Agree (1)*, *Agree (2)*, *Don't Know (3)*, *Disagree (4)* and *Strongly Disagree (5)*.

[28] Respondents were asked to choose between *Better off*, *About the same*, *Worse off* or *Don't know*. *Don't know* responses were coded as *About the same*.

[29] Nine respondents did not know the highest level of education achieved by their parents. These respondents were assigned the modal response of *Some general education but did not complete grade 9*. This change resulted in only a slight change to the coefficient on *Parent education* and slightly reduced the associated p-values. This change permitted the inclusion of the nine additional data points.

Table 2.6 Econometric Results with Ethnicity Dummies

Dependent Variable: Amount taken	β / SE	p-value	β / SE	p-value	β / SE	p-value
	(2)		(4)		(5)	
Constant	29.87	0.00	31.13	0.00	30.47	0.00
	8.33		8.42		8.34	
Receiver is white	-3.14	0.04	-5.75	0.06	-3.64	0.03
	1.52		2.97		1.66	
High-inequality	0.92	0.54	0.88	0.55	0.90	0.55
	1.50		1.49		1.5	
Own racial group has fewer opportunities	-2.66	0.00	-2.77	0.00	-2.64	0.00
	0.86		0.86		0.86	
Close friends w/ person of another race	-0.10	0.95	-0.37	0.81	-0.08	0.96
	1.56		1.56		1.56	
Perceived economic situation	-0.13	0.92	-0.24	0.86	-0.09	0.95
	1.33		1.32		1.32	
Parent education	-0.87	0.06	-0.87	0.06	-0.85	0.07
	0.47		0.47		0.47	
Male	-1.14	0.46	-0.99	0.53	-1.25	0.42
	1.56		1.55		1.56	
Age	-0.34	0.30	-0.41	0.22	-0.35	0.28
	0.33		0.33		0.33	
Number of economics courses	-0.06	0.93	0.08	0.90	0.01	0.99
	0.62		0.62		0.62	
Receiver is Afrikaner[30]	-	-	3.73	0.17	-	-
	-		2.70		-	
Receiver is Zulu	-	-	1.92	0.61	-	-
	-		3.71		-	
Receiver is Xhosa	-	-	3.36	0.26	-	-
	-		3.00		-	
Receiver is Sotho	-	-	-0.75	0.75	-	-
	-		2.35		-	
Dictator and receiver same ethnicity	-	-	-	-	-1.65	0.45
	-		-		2.17	
N	166		166		166	

[30] White receivers primarily identified themselves as Afrikaner (80%). Black receivers primarily identified themselves as Zulu (11%), Xhosa (19%) and Sotho (42%).

Table 2.7 Additional Econometric Results

Dependent Variable: Amount taken	β	p-value	β	p-value	β	p-value
	SE		*SE*		*SE*	
	(2)		(6)		(7)	
Constant	29.87	0.00	29.81	0.00	29.79	0.00
	8.33		*8.32*		*8.46*	
Receiver is white	-3.14	0.04	-3.47	0.07	-3.16	0.04
	1.52		*1.92*		*1.55*	
Close friends w/ person of another race	-0.10	0.95	-0.55	0.80	-0.50	0.76
	1.56		*2.25*		*1.59*	
Receiver is white *and*	-	-	0.88	0.78	-	-
Close friends w/ person of another race	-		*3.10*		-	
Theft victim	-	-	-	-	0.11	0.94
	-		-		*1.54*	
High-inequality	0.92	0.54	0.90	0.55	1.43	0.35
	1.50		*1.50*		*1.51*	
Own racial group has fewer opportunities	-2.66	0.00	-2.66	0.00	-2.78	0.00
	0.86		*0.86*		*0.89*	
Perceived economic situation	-0.13	0.92	-0.10	0.94	0.21	0.88
	1.33		*1.33*		*1.37*	
Parent education	-0.87	0.06	-0.87	0.07	-0.70	0.15
	0.47		*0.47*		*0.49*	
Male	-1.14	0.46	-1.17	0.45	-1.83	0.25
	1.56		*1.56*		*1.57*	
Age	-0.34	0.30	-0.33	0.32	-0.39	0.24
	0.33		*0.33*		*0.33*	
Number of economics courses	-0.06	0.93	0.08	0.90	0.29	0.66
	0.62		*0.63*		*0.65*	
N	166		166		157	

Figure 2.1 Amount Taken
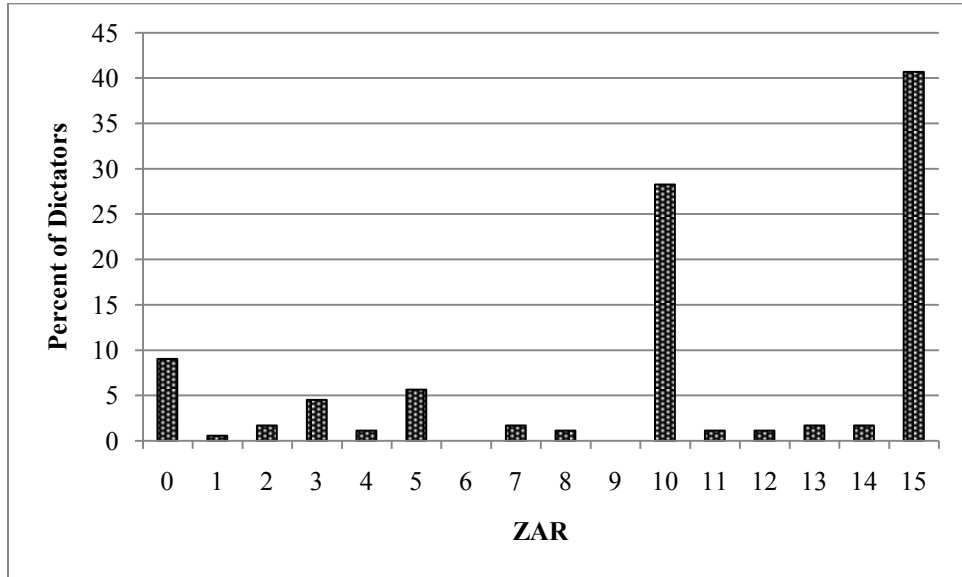
Figure 2.2 Amount Taken by Receiver Race

36
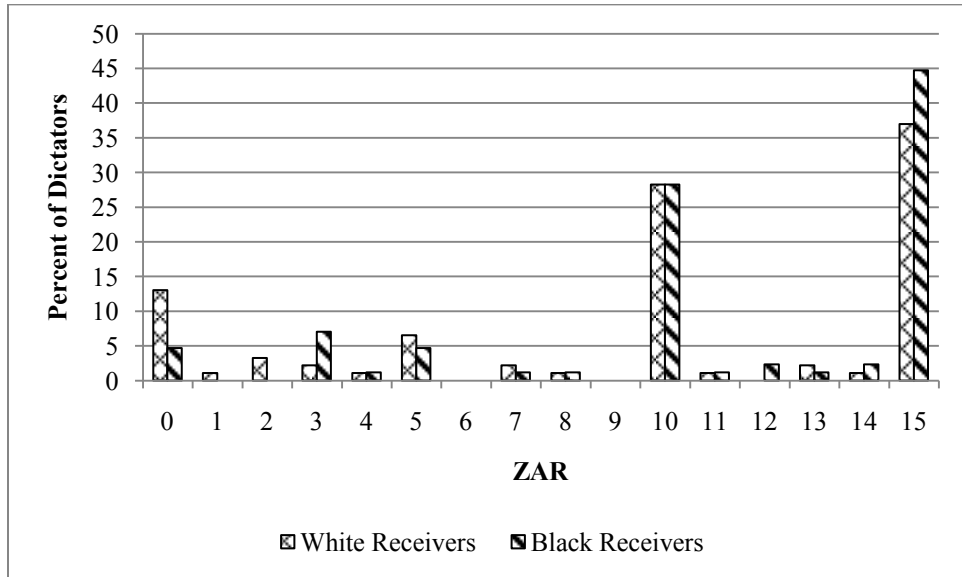
Figure 2.3 Amount Taken by Level of Inequality
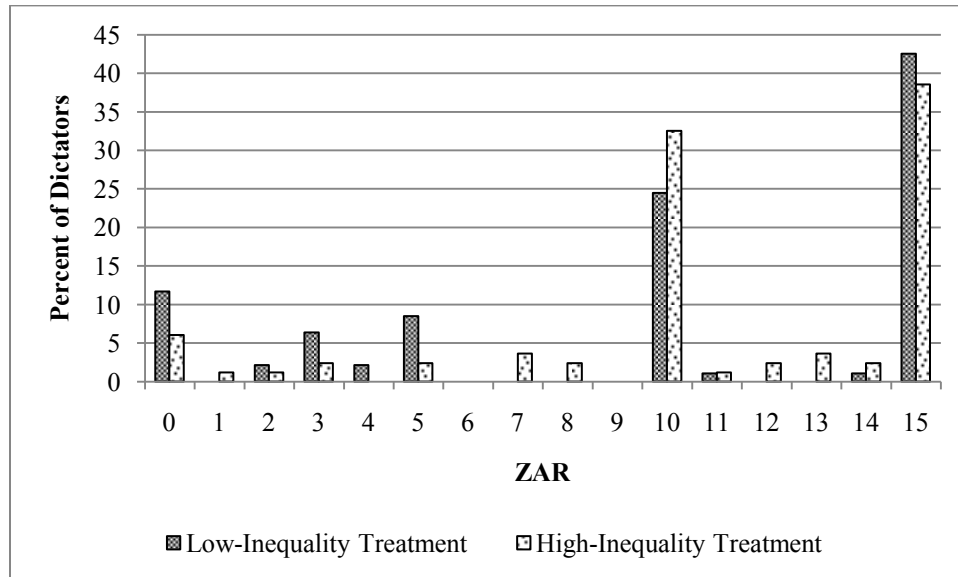
Figure 2.4 Amount Taken by Receiver Race and Level of Inequality
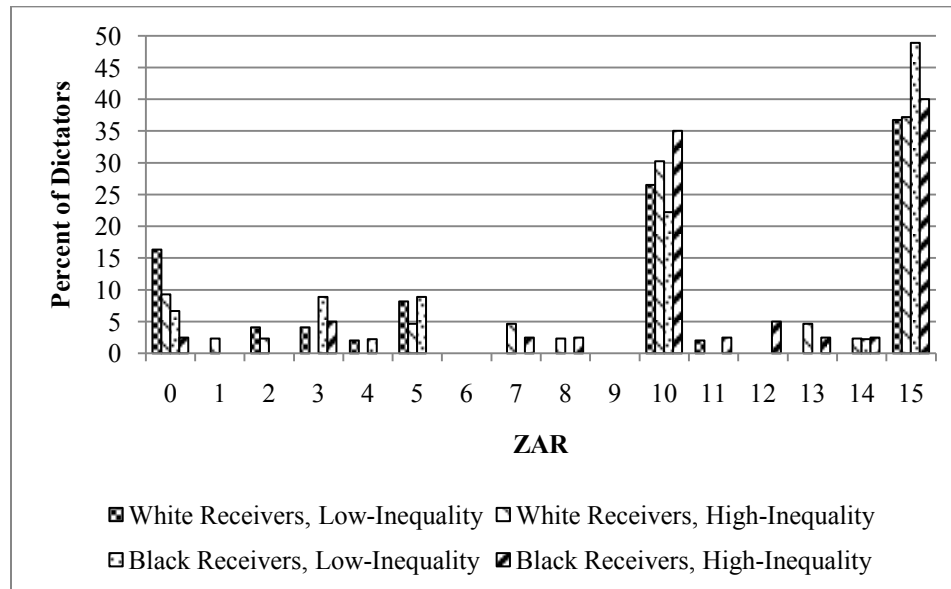
CHAPTER 3

THEFT AND OTHER REGARDING PREFERENCES

3.1   INTRODUCTION

The most basic economic models of human behavior assume that individuals seek to maximize their own welfare. This canonical decision-making model suggests that individuals care about their own well-being but give little or no weight to the welfare of others. In many cases, selfish utility maximization matches everyday behavior well. At other times, people diverge from this simplistic caricature and demonstrate that the welfare of others influences decision making. The purpose of this chapter is to describe a theft or "taking" experiment which investigates whether individuals choose to steal as much as they are able, and more importantly, to investigate whether an individual's interest in the welfare of others can be utilized to mitigate theft.

Stealing can be interpreted as a rational decision that involves the transfer of property from one individual to another. It is also easy to imagine a situation where the stolen object either depreciates because it cannot be legally transferred, is somehow damaged during the theft or is simply valued less by the final recipient of the object. In the case of productive assets, the risk of loss among asset owners lowers expected returns, which reduces investment and thus productive economic activity. Additionally, resources dedicated to theft prevention are diverted from more productive uses, causing additional societal losses. The decision to steal can often be viewed as individually rational but selfish behavior that harms another individual and reduces society's overall

welfare. Given that theft reduces societal welfare and is often viewed as immoral, it might seem a strange context to appeal to social or other regarding preferences to mitigate the problem. It is, however, a useful test of the applicability of social preferences.

Beginning early in the last decade, researchers began to develop a large literature on social preferences. This literature investigated when and why individuals choose to incorporate the welfare of others into their decision-making process (e.g. Charness and Rabin, 2002; Fehr and Fischbacher, 2002; Camerer, 2003). One finding of this work is that individuals are sometimes willing to accept a lower payoff to increase (or alternatively, decrease) the payment of another. The relative price of giving has also received attention. Not surprisingly, as the cost of giving falls, the average amount given to another individual or contributed to a public good increases (e.g. Andreoni and Miller, 2002; Goeree, Holt and Laury, 2002). The tendency for individuals to respond to price signals is also utilized in this work. Rather than varying the cost of giving, individuals respond to a change in the external cost of taking (as experienced by the victim) in a "theft" or taking game.

In this experiment, South African university students participate in a taking game where they have the opportunity to take resources from another player.[31] In the baseline treatment, the taker "steals" resources from the other player, and the theft impacts both players' payoffs on the same scale. That is, each unit taken from the victim reduces the

---

[31] The taking game is essentially a reframed dictator game. Rather than allowing the dictator (i.e. proposer) to divide a resource between oneself and another player (the receiver), the dictator has the opportunity to take resources from the endowment of the other player. To maintain language corresponding to the theft example which motivates this work, dictators will often be referred to as "takers" and receivers as "victims".

victim's payoff by one unit and increases the taker's payoff by the same amount. In a later treatment, the taker learns that the amount he or she is able to appropriate has not changed, but the victim will lose twice the amount the taker gains. For example, if the taker chooses to appropriate five units of the resource, the victim will lose 10 units. My motivation is to determine how individuals will react to the increased losses incurred by the victim and the overall societal loss imposed by selfish actions. Given South Africa's high degree of inequality and apartheid history, the impact of this social efficiency information will also be examined in light of the degree of inequality between two players in the game and the racial identity of the theft victim.[32]

In the game, participants demonstrated that concern for the welfare of others did influence decision making related to taking. That is, when the victim's cost of theft increased and thus exceeded the benefit accruing to the taker, the mean amount taken fell 0.9 Rand, or roughly 10 percent. Additionally, there is some evidence that the racial identity of the victim did influence a taker's response to social information. When both the taker and victim are black, the additional loss imposed on the victim reduces theft by 1.4 Rand or about 15 percent. In cases where the taker is black and the victim is white, this social information reduces taking by approximately 0.5 Rand or approximately five percent. Although consistent with theories and other empirical evidence of in-group preference, the differential impact of social information on taking by victim race is not statistically significant at conventional levels. There is also some evidence that takers did respond to the levels of inequality between players in conjunction with the social

---

[32] There is also evidence from other work that racial identity impacts decision making in South Africa. See Burns (2006), Van Der Merwe and Burns (2008) and Haile, Sadrieh and Verbon (2008).

efficiency information. Interestingly, players who were disadvantaged in the high-inequality treatment reacted more strongly to social efficiency information. That is, takers paired with a victim with an endowment of 70 Rand reduced the amount they took due to social efficiency information by 2.30 Rand while takers who were paired with victims with a smaller endowment of 50 Rand actually *increased* the amount they took by 0.3 Rand. Using the Mann-Whitney U test, this difference in responses is statistically significant at a p-value of 0.06.

3.2   EXPERIMENT DESIGN

The experiment reported here was implemented in conjunction with several related games, only some of which are discussed in this chapter. The first of these games was discussed in the previous chapter. Its purpose was to determine how racial identity and inequality influenced a participant's willingness to take from another individual. The experiment reported here extends this work to examine how social efficiency information influences taking decisions and how inequality and a victim's racial identity change the degree to which social information is relevant. As in the previous chapter, the taking experiments took place at two distinct campuses of the University of the Free State in South Africa. The main campus in Bloemfontein is home to a diverse student body while the Qwaqwa campus is home almost exclusively to black students. In total, 362 students participated in this experiment.[33] These 362 students played the role of either victims or takers. The victims were students at the Bloemfontein campus, and they were recruited

---

[33] As will be discussed, a number of these participants are excluded from portions of the analysis due to incomplete responses or the order in which participants responded to questions. Unless noted, the inclusion of these additional participants would strengthen these results.

and participated in the experiment via an online instrument. The takers were recruited via email, classroom announcements, signs on campus and student-to-student recruiting. Of the 181 Bloemfontein students, 92 classified themselves as white and 89 classified themselves as black. The 181 students from the Qwaqwa campus all classified themselves as black, which is consistent with campus demographics. In return for participation in the experiments, each subject was promised a 20 Rand participation payment and the opportunity to earn additional money. At the time the experiments were implemented, 20 Rand was enough to purchase lunch at the campus cafeteria.[34] As this experiment was implemented in conjunction with the experiment reported in the last chapter, players in Bloemfontein were asked to complete a word scramble task. For completing the word scramble task, Bloemfontein participants earned an additional payment. Although the Bloemfontein players were randomly assigned an additional payment of either 30 or 50 Rand, they were not informed that there were two potential payment sizes. Qwaqwa participants only learned the size of additional payment their partner received and that it was earnings for completing a task. This additional payment served as the endowment from which Qwaqwa players were able to take, and it also created two levels of inequality between the Bloemfontein and Qwaqwa participants. Table 3.1 summarizes the four treatment groups, which differ based on the level of inequality in the experiment and the racial identity of the Bloemfontein participant.

The first step of the experiment occurred in Bloemfontein. Although Bloemfontein participants were only receivers in this game, they provided demographic

---

[34] In August 2010, the exchange rate was 7.3 ZAR = 1 USD. Lunch in the Qwaqwa campus cafeteria was between 13 and 20 Rand. Lunch was slightly more expensive on the Bloemfontein campus.

information and a surname that was used to convey their racial identity to the takers on the Qwaqwa campus.[35] Decisions in Qwaqwa took place during 10 sessions in a laboratory (i.e. classroom) experimental setting. Before making any decisions, Qwaqwa participants were reminded that their decisions involved real money. Qwaqwa participants also learned the surname and the initial payment of the Bloemfontein player as well as a reminder of their own payment. The Qwaqwa players then began the decision-making portion of the experiment. The decision-making portion of the experiment in Qwaqwa consisted of up to four distinct questions, only two of which are discussed in this chapter.[36] Participants were first presented with a baseline decision followed by the social information decision on a subsequent page. Note that the questions are identical except for two distinctions. In the social efficiency information treatment, a victim will lose twice the amount appropriated by the taker. The external cost of taking has doubled. For example, if the taker decides to appropriate 10 Rand in the social information treatment, the taker will receive 10 Rand. However, the victim in this case will lose 20 Rand. This is in contrast to the baseline treatment in which a decision to take 10 Rand increases the payoff to the taker by 10 Rand and lowers the payoff to the victim by the same 10 Rand. A second distinction is that players are paired with a different individual so that each decision is a one-shot interaction. Although participants are paired with a new participant, dyads are formed so that the race and level of inequality remain constant between the baseline and social efficiency information

---

[35] See Appendix A for sample black- and white-sounding South African surnames.
[36] Note that participants are only paid based on one randomly selected decision. Participants received no feedback between questions and did not learn which decision would impact their earnings until after the experiment.

treatment. The (low-inequality) baseline condition is presented in Table 3.2. The social

information treatment is presented in Table 3.3. The ways in which the social

information treatment differs from the baseline condition are underlined. Underlining

was not present in participant materials. In addition to the questions above, participants

responded to other questions for games not discussed here and completed a demographic

survey.

3.3   RESULTS

In this section, taking behavior in the baseline treatment is briefly discussed. Taking

behavior in response to social efficiency information is then compared to the baseline

treatment. The influence of social efficiency information is also considered in the context

of inequality and racial identity. Throughout the analysis, visual and non-parametric

statistical methods are used to describe differences between treatment groups and

conditions, and then regression analysis is used to examine these and other variables of

interest.

Baseline treatment

As described in the previous chapter related to the baseline treatment, takers (or dictators)

took 10.4 Rand from receivers which accounts for approximately 69 percent of the

vulnerable endowment. The distribution of taking in the baseline condition is presented

in Figure 3.1.

The main finding of the previous chapter is that racial identity influences decision

making in the taking game. That is, black takers choose to take approximately 15 percent

44

more from black receivers than from white receivers (11.1 to 9.7 Rand).[37] Interestingly,

this finding conflicts with previous work on social distance in South Africa, which

indicates that individuals typically favor those more similar to themselves (Van Der

Merwe and Burns, 2008; Burns, 2004; Burns, 2006; Haile, Sadrieh and Verbon, 2008).

Potential explanations for this finding include the influence of social norms that

discourage black South Africans from challenging white South Africans or the influence

of ethnic considerations. Additionally, there is some evidence that inequality

considerations also influence individuals to take approximately one Rand more in the

high-inequality treatment but this finding was not statistically significant (Mann-Whitney

p-value = 0.41). These previous findings provide context for the current work, which

focuses on the impact of social efficiency information and taking behavior.

Social efficiency information

The principal difference between the baseline treatment and the social efficiency

information treatment is the greater loss suffered by the victim for a given amount of

theft. Recall that the victim suffers twice the loss in the social efficiency information

treatment, while the benefit to the taker does not change. In the complete sample, takers

took 10.4 Rand from victims in the baseline treatment and only 8.3 Rand after individuals

learn of the higher loss suffered by victims in the social efficiency information treatment.

This difference is highly statistically significant (Wilcoxon signed-rank test, $p < 0.0001$).

However, the highly significant difference between these two treatments overlooks a

relevant characteristic of the design of the experiment.

---

[37] A Mann-Whitney U test yields of p-value of 0.09. Likewise, regression analysis of taking behavior finds
that white South Africans are significantly less vulnerable to taking in the game.

In the implementation of the experiment, all of the participants answered the baseline question first, followed by multiple additional treatments. Approximately half of the participants were exposed to the baseline condition and then immediately exposed to the social efficiency information condition. Consider these participants to be members of Group A. Group B consists of the other half of the participants. Group B participants were exposed to the baseline condition followed by another unrelated condition before the social efficiency information condition. This distinction is outlined below.

Group A-Treatment Order
    Baseline → Social Efficiency Information → Unrelated Treatment

Group B-Treatment Order
    Baseline → Unrelated Treatment → Social Efficiency Information

Participants in Group A take 9.0 Rand in the social efficiency information condition while Group B participants take only 7.6 Rand in the social efficiency information condition. A Mann-Whitney U test detects a significant difference between the responses of Group A and Group B (p = 0.04). A likely explanation for this difference is Group B's exposure to the unrelated treatment which, in a separate analysis, also significantly reduces the amount a participant chooses to take. Thus, the inclusion of Group B might overstate the influence of the social efficiency information by measuring the joint effect of the unrelated treatment and the social efficiency information.[38] A more accurate measure of the impact of the social efficiency information is obtained by excluding

---

[38] Although it is possible that the order in which participants respond to questions influences results, learning effects are not believed to impact decision making in the games. The decisions participants are asked to make are exceedingly simple. They are only paid for one randomly selected decision and receive no feedback during the experiment.

Group B participants from this portion of the analysis.[39] The smaller sample of Group A

participants (n = 88) chose to take 9.9 Rand in the baseline condition and 9.0 Rand in the

social efficiency information condition. Although the impact of the social efficiency

information is smaller for the restricted sample, this difference is not subject to the

potential joint impact of multiple treatments in relation to the baseline. The Wilcoxon

signed-rank test yields a larger yet respectable p-value of 0.07, indicating that social

efficiency information reduces taking by approximately one Rand in the game. This is

also visually apparent when examining the difference in taking behavior between the two

treatments for the restricted sample. This information is presented in Figure 3.2.

There is variation in how individuals change their taking behavior in response to

social efficiency information. A quarter of the participants choose not to alter their

taking behavior in response to the social efficiency information. Interestingly, those who

choose not to alter their behavior are on average more selfish than other participants with

a mean amount taken of 10.9 Rand relative to the baseline mean of 9.6 Rand for other

participants. An additional 44 percent of participants decided to reduce the amount they

took while the remaining 31 percent actually increased the amount they chose to take.

On average individuals chose to reduce the amount they took from the victim by

approximately one Rand.

---

[39] Unless otherwise noted, visual and non-parametric results are based on the restricted sample. In the econometric analysis that follows, the entire data set is utilized. The econometric models include controls for the order in which participants were exposed to different treatments.

Race and social efficiency information

The previous chapter demonstrates that racial identity does influence taking decisions. Contrary to an "in-group bias" hypothesis, the experiment described in the last chapter found that black dictators were more willing to take from black receivers than from white receivers. Modifying Figure 3.2 to account for the victim's race also yields evidence that race influences responses to social efficiency information. In-group bias appears to play some role once social efficiency information is revealed.

Figure 3.3 demonstrates several interesting findings. On average, black takers paired with black victims reduce the amount they take by more than black takers paired with white victims. The mean reduction in taking is 0.5 Rand for those paired with white victims and 1.4 Rand for those paired with black victims. Although the responses to social efficiency information appear to differ based on the race of the victim, a Mann-Whitney U test fails to detect a significant difference in responses to social efficiency information based on victim race (p = 0.27). Additionally, the variation in responses to social efficiency information is more dispersed for those paired with white victims.

To summarize the results related to race and social efficiency information, black takers prefer to take more from black receivers (or victims) than white receivers (or victims) in the baseline treatment. However, once the external cost of taking increases in the social efficiency information treatment, black takers paired with black receivers reduce the amount they choose to take by more than black takers who are paired with white receivers. Although the differences in these reductions are not statistically significant, this result helps illustrate a curious picture. First, black takers exhibit

hesitation in taking from white receivers. Second, when theft imposes greater losses on

victims, black takers reduce taking more when paired with black victims relative to when

they are paired with white victims. Even with this larger reduction in taking when paired

with a black receiver, black receivers on average still lose more money than white

receivers in the social efficiency information condition.[40]

Inequality and social efficiency information

Differences in the response to the social efficiency information by the level of inequality

provide another interesting result. Recall that takers in the baseline treatment showed a

tendency to take less from victims in the low-inequality treatment. Although this

tendency was not statistically significant, it suggests that takers prefer to take from

someone who has more relative to another who has less. The author expected that when

takers were confronted with the increased external cost of theft in the social efficiency

information condition, they would again favor those with lower endowments. Takers

were expected to reduce the amount they took from those in the high-inequality condition

by less than from those in the low-inequality condition. Surprisingly, takers behaved

contrary to this expectation. In response to social efficiency information, takers in the

high-inequality treatment reduce the amount they choose to take *more* on average than

those in the low-inequality treatment. This is shown in Figure 3.4.

Takers in the high-inequality treatment, on average, reduce the amount they take

due to social efficiency information by 2.3 Rand. Takers in the low-inequality treatment

---

[40] The difference in the amount taken from black victims and white victims is no longer statistically significant in the social efficiency information condition. White victims on average lose 8.5 Rand relative to 9.5 for black victims. The p-value from the Mann-Whitney U test is 0.36.

actually increase the amount they choose to take from the Bloemfontein participants by 0.3 Rand after they learn of the social efficiency losses from taking. A Mann-Whitney U test yields a p-value of 0.06 indicating significance at levels near standard thresholds.[41] This finding is robust to checks of the randomization as no significant differences in demographic variables were found between the low- and high-inequality treatments. As will be shown in the following paragraphs, this finding is moderately robust to conditioning on additional controls in the econometric analysis.

Econometric results

Given the data used in the econometric analysis is panel data and the dependent variable is censored, several broad classes of models are utilized to establish the general robustness of the results. First, an ordinary least squares (OLS) specification is shown to be similar to a tobit model. Although not directly compared to these first two models, the results of an ordered probit are largely analogous. Then the OLS specification is examined to assess its suitability relative to both random effects and fixed effects models. Based on the results of the Breusch-Pagan and Hausman tests, as well as the heavy censoring of the dependent variable, several versions of a random effects tobit are discussed in more detail. Before examining each of these models in turn, the relevant independent variables are described.

---

[41] It should be noted that this finding is no longer statistically significant when Group B participants are also included in the non-parametric analysis ($p = 0.29$). For the complete sample, social efficiency information reduces taking in the high-inequality group by 2.7 Rand and 1.5 Rand for the low-inequality group.

The results of previous experiments in South Africa provide useful guidance with respect to appropriate controls (Van Der Merwe and Burns, 2008; Burns, 2004; Burns, 2006; Haile, Sadrieh and Verbon, 2008). The main model consists of the primary explanatory variables, including the race of the victim, the level of inequality between players and whether the participant is in the social efficiency information condition. Additional controls that have been found to be important in other work are also utilized. These include an individual's perception of opportunities for members of their racial group, race of close friends, perceived economic status and the level of education achieved by one's parents. A number of dummy variables to indicate a receiver's membership in main ethnic groups were included, as were standard controls such as age, sex and the number of economics courses taken. Finally, an additional dummy variable (Group B treatment order) was introduced to indicate whether the participants who were exposed to the social efficiency information treatment after both the baseline and the unrelated treatment responded differently to the social efficiency condition than participants who participated in the social efficiency information treatment immediately after the baseline. As mentioned above, the OLS model (1) and the tobit model (2) results are largely similar and displayed in Table 3.4.

In both models (1) and (2), a white receiver is less vulnerable to theft. Additionally, *fewer* perceived opportunities for one's racial group and increased levels of parental education are associated with less theft.[42] There is also some evidence that increasing age leads to less theft. Finally, the primary question of interest in this work is

---

[42] Paradoxically, taking decreased as individuals reported fewer opportunities for their racial group. One potential explanation for this finding is that those with fewer opportunities may be more concerned about potential retaliation for taking from more "powerful" individuals.

whether the social efficiency condition reduces theft. Both models provide strong

evidence that it does. Additionally, Group B participants respond more strongly to the

social efficiency condition than Group A participants, as indicated by the Group B

treatment order coefficient.

As a further check of robustness, an ordered probit model was also estimated.

The dependent variable (i.e. the taking choice on [0, 15]), was categorized into four

distinct levels. The first level is a decision to take nothing from the other player. The

second level is the decision to take a "small" amount between one and five Rand. The

third level represents taking a "medium" amount between six and ten rand. Finally, those

who chose to take more than ten Rand were categorized into the fourth level. Of more

than 350 observations, 8 percent were choices to take nothing, 22 percent chose a small

amount, and 30 percent and 40 percent took a medium and large amount respectively.

The purpose of the ordered probit is to show that the same factors that are associated with

increased taking in the OLS model (1) and the tobit model (2) remain important in the

ordered probit providing further evidence of general robustness. Although it is difficult

to draw direct comparisons between the ordered probit coefficients, or even the marginal

effects, the results are largely consistent with the previous two models. For the interested

reader, the ordered probit results and the associated marginal effects are presented in

Table 3.5.

Now that the results have been shown to be robust to various model types, the

OLS model (1) results are considered relative to fixed effects and random effects models.

Although the tobit model is later used to more thoroughly examine the results, OLS is

52

considered relative to random effects and fixed effects using a linear specification, since appropriate tests to differentiate these models are readily available. Table 3.6 contains the OLS model (1) results as well as the corresponding random effects (3) and fixed effects (4) models.

A first general finding is the close correspondence between the OLS (1) and random effects (3) models. The fixed effects model (4) differs to some extent and many of the invariant predictors are no longer represented in the model. The Breusch-Pagan test is used to determine if the random effects model (3) is preferred to OLS (1). This test yields a p-value smaller than 0.01, indicating the presence of random effects and a preference for the random effects model (3) rather than the OLS specification. The Hausman test is also used to determine whether a random effects model (3) or a fixed effects model (4) is appropriate. The Hausman test yields a p-value of 0.41. This value indicates that one can use the random effects model over the fixed effects specification. Because it is useful to have parameters estimated that do not vary over the panel and because of the censored nature of the data, several random effects tobit models are specified and discussed. These models are included in Table 3.7.

The results of the random effects tobit (5) support the hypothesis that increasing the external cost of taking reduces theft. When individuals learn that taking exacts a cost in excess of their own benefit upon the other player in the social efficiency condition, takers on average appropriate 2.1 fewer Rand (p = 0.01). Evidence that social efficiency information mitigates taking is even stronger among (Group B) participants who were exposed to another treatment prior to the social efficiency information condition. These

individuals reduced taking by an additional 2.7 Rand in this treatment ($p = 0.01$),

although at least some of this reduction is likely attributable to the transfer of resources

received in the intervening treatment. Many of the results of the previous chapter are also

corroborated.[43] When a receiver is a white participant, individuals take about 3.5 Rand

less. Additionally, inequality plays little or no role in decision making. As before, fewer

perceived economic opportunities for one's racial group and increased parental education

are associated with less taking. The remaining controls, including dummy variables to

denote the ethnic identity of victim, are insignificant at the five percent level. Another

random effects tobit model (6), in which dummy variables indicating a victim's ethnic

identity are replaced with a variable that denotes a shared ethnic affiliation between thief

and victim, conveys much of the same information. In both models (5) and (6), ethnic

identity is not a significant predictor of taking behavior. Model (7) eliminates variables

related to ethnicity. The overall results change little between models (5), (6) and (7).

Likelihood ratio tests between models (5) and (7) and models (6) and (7) indicate there is

no significant reduction in the fit for the simplified model ($p = 0.73$ and $p = 0.93$

respectively). Although model (7) is the most parsimonious, the principal finding is

nearly identical to models (5) and (6). Social efficiency information (i.e. increasing the

external cost of theft) reduces the amount individuals choose to take from others.

A secondary question is whether the influence of social efficiency information is

enhanced or diminished based on the racial identity of the victim or the level of

inequality between players. To examine this question, two additional variables are added

---

[43] Restricting the econometric analysis to Group A participants reduces the sample size by half and prevents the discussion of statistically significant results. Group B participants are thus included but controlled for in the analysis.

to model (7) to create model (8). Each new variable is an interaction of the dummy variable indicating the social efficiency information treatment and another dummy variable denoting a taker that is paired with a white victim or a taker is facing more inequality in the high-inequality treatment. Although neither coefficient is significant, the results are, nonetheless, intriguing.[44] When an individual is paired with a white victim, the impact of the social efficiency treatment is less pronounced than when an individual is paired with a black victim. When paired with a white victim in the social efficiency information condition, individuals do reduce the amount they take. However, when takers are paired with a black victim they reduce the amount they take by 0.6 Rand more than when paired with a white victim. This result lends intuitive (if not statistically significant) support to the idea that black individuals are reluctant to take from white receivers, but they are more concerned with the welfare of those with whom they share a racial identity. More curious is the result related to social efficiency information in the context of disadvantageous inequality. In cases where the thief faces *more* inequality, the thief reduces the amount taken in the social efficiency information treatment by nearly two additional Rand relative to cases in which the thief faces less inequality. This is surprising because when an individual is more disadvantaged, he or she seems to become more cognizant and/or concerned for the welfare of the advantaged individual or society as a whole. Although this result is not significant at standard thresholds (p = 0.17), it does corroborate stronger non-parametric evidence for the same finding.[45] Fear of

---

[44] Also note that the coefficient on the dummy variable denoting responses to the social efficiency information condition is no longer significant in model (8) (p = 0.26). Including the three interaction terms, this variable appears four times in model (8).

[45] Recall the p-value associated with the non-parametric test was 0.06 and the differential response to social

reprisal based on wealth (or power) differentials may help explain this finding just as

individuals appear reluctant to take from (presumably more powerful) white receivers.

This "power differential" explanation is intuitive. It should, however, be noted that

wealth differentials between groups are small, that reprisal is not part of the game, and

that inequality seems to play little to no role in taking decisions. Due to these reasons, it

remains odd that the inequality treatment seems to influence differential taking in the

social efficiency condition. An additional possibility is that this finding is simply an

anomaly. Although model (8) is thought provoking, a likelihood ratio test indicates that

including these two additional dummy variables does not significantly improve fit so

model (7) is preferred (p = 0.35).

3.4   CONCLUSION

This chapter uses a taking game to understand how individuals respond to social

efficiency information. When individuals learn that taking exacts a cost on others that

exceeds the benefit they receive, taking is reduced by approximately 10 percent. When

black participants in the role of takers are paired with an individual of the same race,

there is insignificant evidence that social efficiency information encourages them to

reduce the amount they take by more than if they were paired with a white participant.

There is also puzzling evidence that, in response to social efficiency information,

individuals reduce the amount they choose to take by a larger amount when takers are

relatively more disadvantaged. In essence, individuals appear more responsive to social

efficiency information between the low- and high-inequality treatments was 2.6 Rand. Specifically, takers
in the low-inequality treatment increased the amount they took by 0.27 Rand while takers in the high-
inequality treatment decreased the amount they took by 2.3 Rand.

efficiency information when the increased costs of theft are borne by those from whom they prefer to take (black and relatively wealthy victims). Future work should clarify the reasons why individuals respond differently to social efficiency information based on the identity of the other participant. Furthermore, it would be useful to determine how individuals in the field respond to social efficiency concerns and if this information can provide a useful tool to mitigate theft beyond the lab.

Table 3.1 Treatment Groups

Group (# of pairs)	Bloemfontein Participant			Qwaqwa Participant		
	Race	Participation Payment	Additional Payment	Race	Participation Payment	Additional Payment
WRHI[46] (43)	White	20 Rand	50 Rand	Black	20 Rand	0 Rand
WRLI (49)	White	20 Rand	30 Rand	Black	20 Rand	0 Rand
BRHI (41)	Black	20 Rand	50 Rand	Black	20 Rand	0 Rand
BRLI (48)	Black	20 Rand	30 Rand	Black	20 Rand	0 Rand

---

[46] WRHI refers to the White Receiver, High-Inequality treatment. The other groups are similarly identified.

Table 3.2 Baseline Question, Low-Inequality Treatment

****

Your participation payment is 20 Rand. The student A with whom you are paired will receive a participation payment of 20 Rand. In addition, student A has earned an additional payment of 30 Rand for completing a task. This information is summarized in the table below.

	You	Student A
Participation Payment	20 Rand	20 Rand
Additional Payment	0 Rand	30 Rand
Total	**20 Rand**	**50 Rand**

Student A's last name is _____.

It is possible for you to take money from the **additional payment** student A earned for completing a task.
How many Rand do you want to take from the money student A earned?

(Circle your answer below)

0   1   2   3   4   5   6   7   8   9   10   11   12   13   14   15[47]
****

---

[47] Because participants were promised at least 20 Rand for their time, takers were only allowed to take up to 15 Rand from the victim. This ensures that victims in the low-inequality treatment (as shown here) receive the promised 20 Rand even if the taker appropriates all 15 Rand in the social information (i.e. double penalty) condition.

Table 3.3 Social Efficiency Information Question, Low-Inequality Treatment

****

You are now paired with a different student A. Again, consider the following table.

	You	**Student A**
Participation Payment	20 Rand	20 Rand
Additional Payment	0 Rand	30 Rand
Total	**20 Rand**	**50 Rand**

Student A's last name is _____.

It is possible for you to take money from the **additional payment** student A earned for completing a task. However, **for each 1 Rand you take from student A, student A loses the Rand you take plus 1 additional Rand.**
How many Rand do you want to take from the money student A earned?

(Circle your answer below)

0   1   2   3   4   5   6   7   8   9   10   11   12   13   14   15
****

Table 3.4 Econometric Results

Dependent Variable: Amount taken	β	p-value	β	p-value
	SE		*SE*	
	OLS (1)		Tobit (2)	
Constant	19.55	0.00	26.83	0.00
	2.96		*4.68*	
Receiver is white	-2.53	0.02	-3.65	0.03
	1.06		*1.65*	
High-inequality	0.32	0.56	-0.04	0.96
	0.54		*0.83*	
Social efficiency condition	-1.56	0.02	-2.36	0.02
	0.65		*1.00*	
Group B treatment order	-1.36	0.07	-2.22	0.05
	0.75		*1.14*	
Own racial group has fewer opportunities[48]	-1.34	0.00	-2.06	0.00
	0.31		*0.48*	
Close friends w/ person of another race	0.77	0.17	1.28	0.15
	0.56		*0.87*	
Perceived economic situation[49]	-0.09	0.84	-0.20	0.79
	0.47		*0.73*	
Parent education[50]	-0.41	0.01	-0.62	0.02
	0.16		*0.26*	
Male	0.09	0.87	-0.04	0.96
	0.56		*0.87*	
Age	-0.22	0.06	-0.36	0.05
	0.12		*0.18*	
Number of economics courses	-0.05	0.83	-0.01	0.99
	0.22		*0.34*	
Receiver is Afrikaner	1.08	0.26	1.58	0.29
	0.96		*1.50*	
Receiver is Zulu	-0.30	0.81	0.12	0.95
	1.24		*1.96*	
Receiver is Xhosa	-0.30	0.77	0.38	0.81
	1.01		*1.60*	
Receiver is Sotho	-0.21	0.80	-0.12	0.93
	0.83		*1.29*	
N	335		335	

---

[48] Respondents chose from *Strongly Agree (1)*, *Agree (2)*, *Don't Know (3)*, *Disagree (4)* and *Strongly Disagree (5)*.
[49] Respondents were asked to choose between *Better off (1)*, *About the same (2)*, *Worse off (3)* or *Don't Know*. *Don't Know* responses were coded as *About the same*.
[50] Nine respondents did not know the highest level of education achieved by their parents. These respondents were assigned the modal response of *Some general education but did not complete grade 9*.

Table 3.5 Econometric Results, Ordered Probit and Marginal Effects

Dependent Variable: Amount taken	β	p-value	dy/dx	p-value	dy/dx	p-value	dy/dx	p-value	dy/dx	p-value
	SE		*SE*		*SE*		*SE*		*SE*	
	Ordered Probit		Pr(depvar = 0)		Pr(depvar ∈ [1,5])		Pr(depvar ∈ [6,10])		Pr(depvar ∈ [11,15])	
Receiver is white	-0.50	0.04	-0.06	0.05	0.11	0.04	0.02	0.17	-0.19	0.04
	0.24		*0.03*		*0.05*		*0.01*		*0.09*	
High-inequality	0.03	0.78	0.00	0.78	-0.01	0.78	-0.00	0.78	0.01	0.78
	0.12		*0.02*		*0.03*		*0.00*		*0.05*	
Social efficiency condition	-0.26	0.08	0.03	0.09	0.06	0.08	0.01	0.21	-0.10	0.07
	0.15		*0.02*		*0.03*		*0.01*		*0.06*	
Group B treatment order	-0.29	0.08	0.04	0.13	0.06	0.08	0.00	0.57	-0.11	0.07
	0.17		*0.03*		*0.04*		*0.01*		*0.06*	
Own racial group has fewer opportunities	-0.30	0.00	0.04	0.00	0.07	0.00	0.01	0.10	-0.11	0.00
	0.07		*0.01*		*0.02*		*0.01*		*0.03*	
Close friends w/ person of another race	0.23	0.07	-0.03	0.07	-0.05	0.08	-0.01	0.22	0.09	0.08
	0.13		*0.15*		*0.03*		*0.01*		*0.05*	
Perceived economic situation	-0.03	0.80	0.00	0.80	0.01	0.80	0.00	0.80	-0.01	0.80
	0.11		*0.01*		*0.02*		*0.00*		*0.04*	
Parent education	-0.08	0.03	0.01	0.03	0.02	0.03	0.00	0.17	-0.03	0.03
	0.04		*0.00*		*0.01*		*0.00*		*0.01*	
Male	-0.05	0.72	0.01	0.72	0.01	0.72	0.00	0.73	-0.02	0.72
	0.13		*0.02*		*0.03*		*0.00*		*0.05*	
Age	-0.04	0.13	0.01	0.13	0.01	0.13	0.00	0.25	-0.02	0.13
	0.03		*0.00*		*0.01*		*0.00*		*0.01*	
Number of economics courses	0.01	0.92	-0.00	0.92	-0.00	0.92	-0.00	0.92	0.00	0.92
	0.05		*0.01*		*0.01*		*0.00*		*0.02*	
Receiver is Afrikaner	0.18	0.43	-0.02	0.42	-0.04	0.43	-0.01	0.50	0.07	0.43
	0.22		*0.03*		*0.05*		*0.01*		*0.08*	
Receiver is Zulu	-0.08	0.78	0.01	0.79	0.02	0.78	0.00	0.62	-0.03	0.78
	0.29		*0.04*		*0.06*		*0.00*		*0.11*	
Receiver is Xhosa	0.02	0.95	-0.00	0.95	-0.00	0.95	-0.00	0.95	0.01	0.95
	0.24		*0.03*		*0.05*		*0.01*		*0.09*	
Receiver is Sotho	0.15	0.43	0.02	0.41	-0.03	0.43	-0.01	0.56	0.06	0.44
	0.19		*0.02*		*0.04*		*0.01*		*0.07*	
N	340									

Table 3.6 Econometric Results, Random Effects and Fixed Effects

Dependent Variable: Amount taken	β	p-value	β	p-value	β	p-value
	SE		*SE*		*SE*	
	OLS (1)		RE (3)		FE (4)	
Constant	19.55	0.00	19.41	0.00	9.34	0.00
	2.96		*3.46*		*0.58*	
Receiver is white	-2.53	0.02	-2.55	0.02	-	-
	1.06		*1.05*		*-*	
High-inequality	0.32	0.56	0.30	0.64	-	-
	0.54		*0.63*		*-*	
Social efficiency condition	-1.56	0.02	-1.37	0.01	-1.14	0.05
	0.65		*0.54*		*0.59*	
Group B treatment order	-1.36	0.07	-1.75	0.01	-2.25	0.01
	0.75		*0.69*		*0.84*	
Own racial group has fewer opportunities	-1.34	0.00	-1.32	0.00	-	-
	0.31		*0.36*		*-*	
Close friends w/ person of another race	0.77	0.17	0.76	0.25	-	-
	0.56		*0.66*		*-*	
Perceived economic situation	-0.09	0.84	-0.08	0.88	-	-
	0.47		*0.55*		*-*	
Parent education	-0.41	0.01	-0.42	0.03	-	-
	0.16		*0.20*		*-*	
Male	0.09	0.87	0.11	0.87	-	-
	0.56		*0.66*		*-*	
Age	-0.22	0.06	-0.22	0.10	-	-
	0.12		*0.14*		*-*	
Number of economics courses	-0.05	0.83	-0.03	0.90	-	-
	0.22		*0.26*		*-*	
Receiver is Afrikaner	1.08	0.26	1.41	0.11	1.87	0.07
	0.96		*0.88*		*1.03*	
Receiver is Zulu	-0.30	0.81	-0.20	0.86	-0.14	0.91
	1.24		*1.11*		*1.28*	
Receiver is Xhosa	-0.30	0.77	-0.26	0.78	0.04	0.97
	1.01		*0.93*		*1.11*	
Receiver is Sotho	-0.21	0.80	0.40	0.61	1.44	0.15
	0.83		*0.78*		*0.99*	
N	335		335		335	

Table 3.7 Econometric Results, Random Effects Tobit Models

Dependent Variable: Amount taken	β SE	p-value	β SE	p-value	β SE	p-value	β SE	p-value
	RE Tobit (5)		RE Tobit (6)		RE Tobit (7)		RE Tobit (8)	
Constant	26.45 *5.24*	0.00	26.62 *5.20*	0.00	26.59 *5.19*	0.00	26.31 *5.20*	0.00
Receiver is white	-3.48 *1.61*	0.03	-2.40 *1.00*	0.02	-2.37 *0.94*	0.01	-2.68 *1.18*	0.02
High-inequality	-0.11 *0.94*	0.90	-0.13 *0.94*	0.89	-0.14 *0.94*	0.88	0.85 *1.18*	0.47
Social efficiency condition	-2.11 *0.86*	0.01	-2.12 *0.87*	0.02	-2.12 *0.87*	0.01	-1.47 *1.31*	0.26
Group B treatment order	-2.66 *1.08*	0.01	-2.67 *1.08*	0.01	-2.67 *1.08*	0.01	-2.73 *1.08*	0.01
Own racial group has fewer opportunities	-2.01 *0.54*	0.00	-2.01 *0.54*	0.00	-2.01 *0.54*	0.00	-2.00 *0.54*	0.00
Close friends w/ person of another race	1.43 *0.99*	0.15	1.48 *0.98*	0.13	1.48 *0.99*	0.13	1.46 *0.98*	0.14
Perceived economic situation	-0.20 *0.83*	0.81	-0.22 *0.82*	0.79	-0.22 *0.82*	0.79	-0.22 *0.82*	0.79
Parent education	-0.61 *0.29*	0.04	-0.60 *0.29*	0.04	-0.61 *0.29*	0.04	-0.61 *0.29*	0.04
Male	0.06 *0.98*	0.95	-0.01 *0.98*	0.99	-0.00 *0.98*	1.00	-0.02 *0.97*	0.99
Age	-0.37 *0.21*	0.07	-0.36 *0.21*	0.08	-0.36 *0.21*	0.08	-0.36 *0.21*	0.08
Number of economics courses	0.03 *0.38*	0.95	0.03 *0.38*	0.93	0.03 *0.38*	0.93	0.03 *0.38*	0.94
Receiver is Afrikaner	1.81 *1.38*	0.19	- -	-	- -	-	- -	-
Receiver is Zulu	0.42 *1.80*	0.82	- -	-	- -	-	- -	-
Receiver is Xhosa	0.43 *1.47*	0.77	- -	-	- -	-	- -	-
Receiver is Sotho	0.68 *1.23*	0.58	- -	-	- -	-	- -	-
Taker and receiver same ethnicity	- -	-	-0.09 *1.14*	0.93	- -	-	- -	-
White receiver-efficiency interaction	- -	-	- -	-	- -	-	0.57 *1.34*	0.67
High inequality-efficiency interaction	- -	-	- -	-	- -	-	-1.85 *1.34*	0.17
N	335		335		335		335	

Figure 3.1 Amount Taken in Baseline
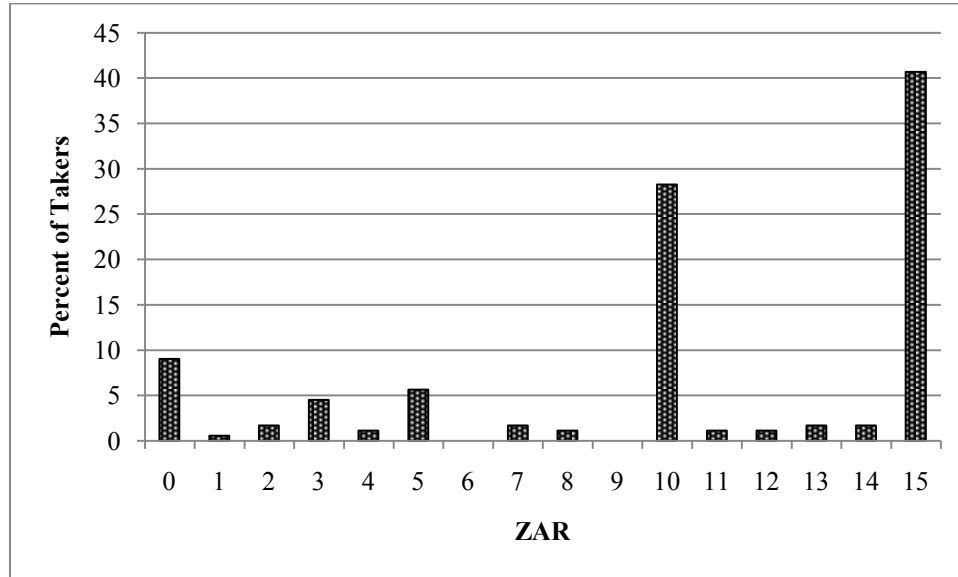
Figure 3.2 Change in Taking due to Social Efficiency Information
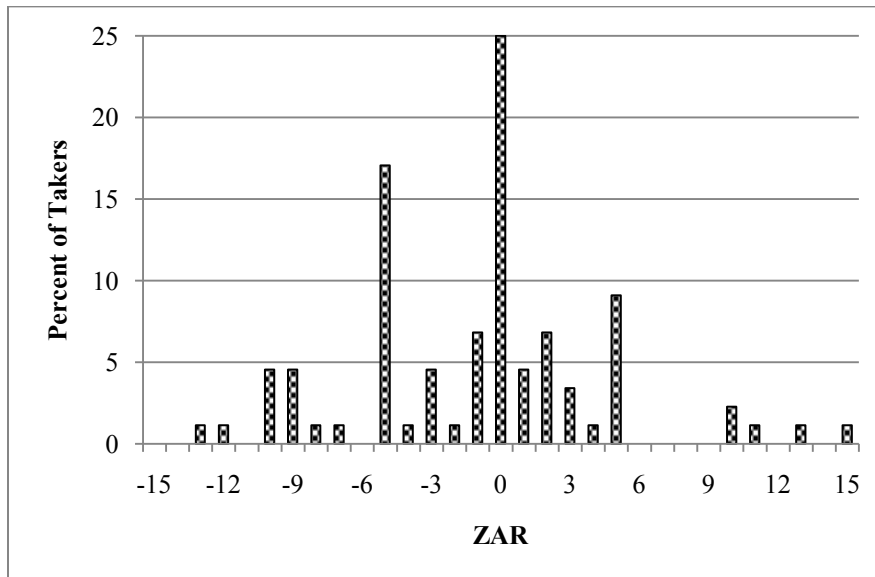
Figure 3.3 Change in Taking due to Social Efficiency Information by Race
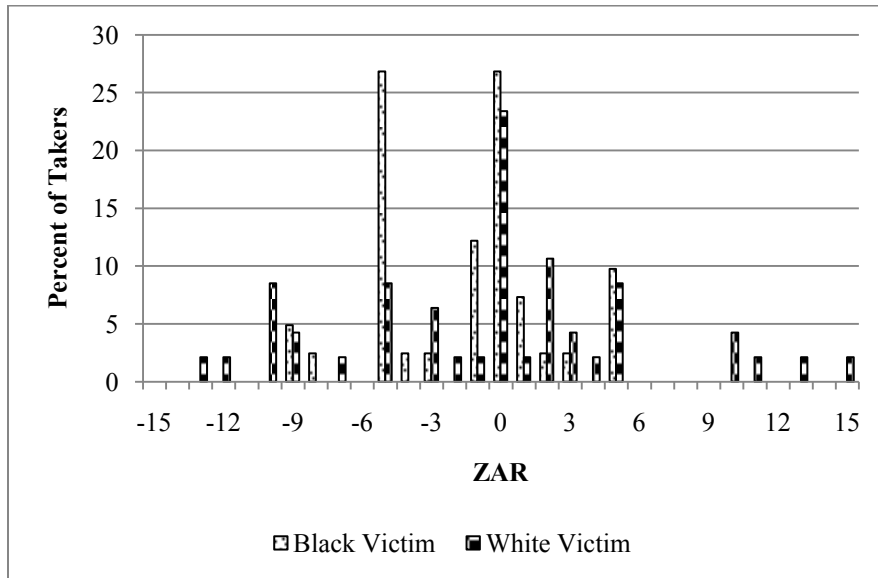
Figure 3.4 Change in Taking due to Social Efficiency Information by Level of Inequality
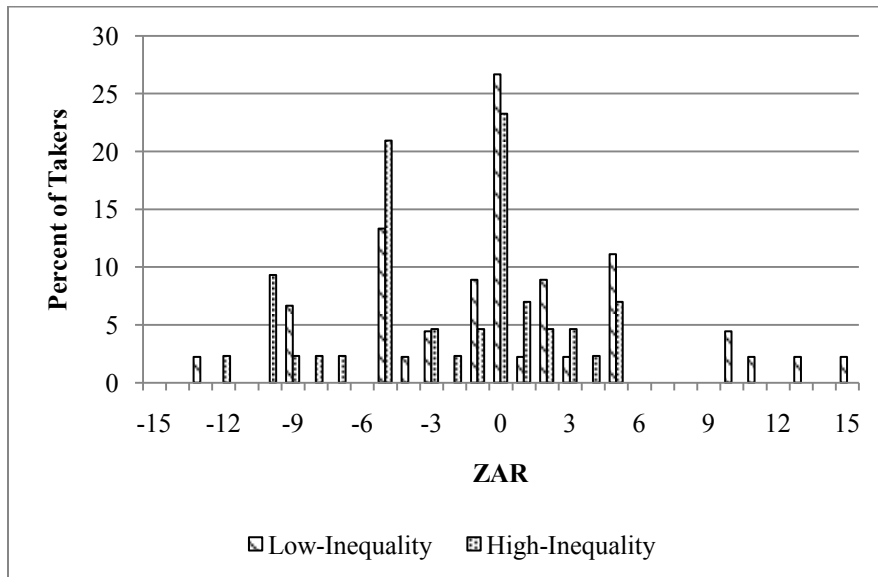
CHAPTER 4

THEFT MITIGATION THROUGH GIFT-GIVING

4.1   INTRODUCTION

The laboratory experiment described in this chapter uses a dictator (or taking) game to examine how individuals respond to resource transfers from a potential victim before deciding how much to take. The impetus for this work is a South Africa university administrator's successful efforts to use gift-giving (i.e. sharing agricultural training and output) to alleviate the theft of livestock and agricultural production from university research land. Given the success of this intervention in reducing theft, it is useful to understand what factors were integral to its success, and under what circumstances this strategy could be applied elsewhere. Principal factors of interest in this work are the size of the transfer and how the transfer is framed.

In this experiment, potential "thieves" respond to several resource transfers to determine how size influences taking decisions. Additionally, transfers are described as either gifts, bribes or payments to determine if framing influences decision making. Overall, transfers reduce the amount a taker chooses to appropriate from a potential victim. However, in a one-shot interaction only small transfers appear to have the potential to reduce a victim's total losses, which include the resource transfer and the subsequent theft. For most transfer sizes, offering resources to a potential taker leads to higher total losses for the victim. There is little evidence that variation in the size or the framing of the transfer influences a taker's response.

Although not well publicized in the developed world, livestock theft is common in developing countries. In South Africa, livestock thefts in the 2007/2008 fiscal year include 60,000 cattle, 80,000 sheep and 35,000 goats, amounting to 358 million Rand, or approximately US $48 million in stolen livestock (Brand).[51] Combining theft data with South African Department of Agriculture statistics, stolen livestock represents 2.3 percent of the value of cattle, sheep and goats processed that year (RSA Department of Agriculture, Forestry and Fisheries). The impacts are also magnified because livestock theft undercuts economic development efforts and complicates other objectives such as poverty alleviation (Khoabane and Black, 2009). Stories of farmers unable to use land or switching to alternative outputs due to theft concerns are not uncommon. Food security concerns highlight the importance of accessing available resources in the region. In addition, the South African government has set an ambitious goal of reallocating 30 percent of land to black South Africans. The implementation of this program has been particularly difficult. One challenge is the harsh agricultural conditions in South Africa. Most farmers in South Africa were raised on the farm, and land was passed down through the generations. This lifetime of experience gives established (commercial) farmers an advantage in a challenging environment. Beneficiaries of the land reform program (emerging farmers) have not shared in a lifetime of capacity building and face a difficult learning curve. Livestock theft adds to the challenge as emerging farmers suffer losses at a 3:1 ratio after adjustment for herd size (Brand). In short, livestock theft is a serious challenge in the region.

---

[51] The South African Rand (ZAR) fluctuated between seven and eight Rand to the Dollar for most of 2007 and 2008.

Consider livestock theft in a dictator or taking game framework. The potential thief is the proposer who can choose the final resource outcome by stealing while the farmer is in the (nearly) powerless position of the recipient. Although the farmer has tools to limit theft, lands are generally so large that effective protection or policing is prohibitively expensive and/or ineffective. In the dictator game, proposers do not generally divide an endowment such that the receiver gets nothing. In the case of livestock theft, that would mean potential thieves do not steal as much as they are able. Potential thieves might be influenced by reciprocity concerns, a distaste for taking or by social considerations. For example, the last chapter showed that taking behavior is altered by the racial identity of the potential victim. Reciprocal behavior may also play a role in mitigating livestock theft. If the farmer makes a resource transfer (i.e. a gift or a payment) to a potential thief, this may encourage reciprocal behavior and reduce theft. The following paragraph outlines the basic structure of a thief's utility function and describes how reciprocity considerations might influence decision making.

To demonstrate how reciprocity might influence a thief's decision making, consider a simplified utility function based on Falk and Fischbacher's theory of reciprocity (2006).[52] Their theory accounts for both the consequences of an action as well as how kindly an action is perceived. In this simplified illustration, we consider only the thief's utility. This utility U is dependent on the thief's material payoff π, a reciprocity parameter ρ, a kindness term φ and a reciprocation term σ. The function takes the following form.

---

[52] Models of reciprocity also include Bolton and Ockenfels (2000), Dufwenberg and Kirschsteiger (2004), Charness and Rabin (2002) among others.

$$(1)\ U = \pi + \rho\varphi\sigma$$

In the theft game, the material payoff π is simply the sum of the amount that the thief

chooses to appropriate and the resource transfer received from the potential victim. The

reciprocity parameter ρ is a non-negative number. A larger ρ indicates a thief places

greater weight on reciprocal considerations. If ρ is zero, the utility function collapses into

a standard utility function determined only by material payoffs. The kindness term φ

measures how the thief perceives the action of the potential victim. Given all the

information available, the thief evaluates the resource transfer offered by the potential

victim. If the potential victim makes an offer that exceeds the thief's expectations or the

amount a thief perceives to be "fair", φ is positive. If the potential victim does not meet

expectations or acts "unfairly", the kindness term φ is negative. The final element in the

thief's utility function is the reciprocation term σ. After observing the resource transfer

from the potential victim, the thief then chooses whether to act kindly in return. In this

illustration, acting kindly means choosing to steal less than the thief perceives as

equitable. A thief perceiving their own action as kind is represented by a positive

reciprocation term σ. A positive σ does not necessarily mean that the *potential victim* sees

the theft choice as kind. The thief is also able to act unkindly by stealing more than he or

she perceives as fair. In this case, the reciprocation term σ is negative. To summarize, a

thief's utility is determined by their own material payoff as well as the product of how

they perceive the potential victim's action and their own response to it. If the potential

victim behaves kindly and the thief reciprocates, the thief's utility may increase relative

to that derived from only the material payoff. A thief's utility may also increase if the

potential victim behaves unkindly and the thief reciprocates. Instances in which one

agent behaves kindly while the other is unkind lower the thief's utility. Individuals only

interested in material payoffs will be unaffected by the kindness or unkindness of the

action. The adaptation of Falk and Fischbacher's utility function helps illustrate how

reciprocity might enter a thief's decision-making process (2006). Whether a resource

transfer from a victim to a thief can actually increase the welfare of both parties is

ultimately a question that hinges on the importance of reciprocity relative to material

payoffs for each agent. Other research examines similar questions and is discussed

below.

The economics of crime and deterrence have long attracted the attention of

economists (e.g. Becker, 1968). Livestock theft, however, presents different challenges

because enforcement and punishment are not credible deterrents due to high detection

and enforcement costs. In spite of the prevalence of the problem, little academic research

focuses on livestock theft. Schechter (2007) is an important exception. Schechter

develops a dynamic limited-commitment model of theft and gift-giving and conducts

field experiments with Paraguayan farmers on risk aversion and trust.   Schechter finds

that giving increases when trust is low and the threat of theft is high. While Schechter

shows how a gift-giving equilibrium develops in response to theft, the current work uses

a theft experiment to determine if "imposing" gift-giving might reduce theft in a

segmented society. The current work also focuses more on the responses of potential

thieves rather than the decision to offer a gift.

In addition to the limited work on theft and gift-giving, there is a more expansive literature on payments, gifts and reciprocity. Perhaps the best known studies are related to worker responses to higher than expected wages (Gneezy and List, 2006; Fehr, Kirchsteiger and Riedl, 1993). While Fehr, Kirchsteiger and Riedl find quality improvements to higher than expected wages, Gneezy and List find increased worker effort in the short-run dissipates and does increase productivity in the long-run. There is also related research on crowding-out and framing. Crowding-out theory says that when extrinsic rewards are offered for intrinsically rewarding tasks, the extrinsic motivation crowds-out or replaces the reward inherent to the task. Titmuss (1970) argued that monetary compensation might discourage blood donation by undermining a sense of civic duty. An experimental test of this hypothesis later verified his prediction (Mellström and Johannesson, 2008). Similar results were found in a test of Swiss residents' willingness to accept a nuclear waste facility in their region. When payment was offered in return for acceptance of the facility, the level of acceptance fell (Frey and Oberholzer-Gee, 1997). In psychology, Deci (1971) has long made similar arguments about the impact of extrinsic motivation (economic incentives) on internal motivation. Similar work by Gneezy and Rustichini shows that the effect of payment on performance and effort is not monotonic (2000). Gneezy and Rustichini use an IQ test and success at soliciting charitable donations to measure performance and effort.   In both contexts, at low levels, payment inhibits performance and/or effort relative to a no payment control, but as payments rise they improve. Crowding-out is a relatively stable phenomenon when payments are offered. However, the impact does not appear when payment takes

the form of a gift. For example, Falk (2007) conducts a field experiment soliciting

donations from residents of Zurich, Switzerland for street children in Dhaka. Three

treatment groups are formed based on gift size: no gift, small gift or large gift. The gifts

of postcards drawn by children were meant to encourage donations for the children in

Dhaka. Although differences were small, donations were lowest in the no gift condition,

followed by the small gift condition and then the large gift condition. This work provides

evidence that the framing (payment or gift) influences how recipients view the

transaction and thus whether crowding-out occurs. The next section of this chapter

describes how the experiment was designed and implemented. The third section outlines

non-parametric and econometric results. The fourth section concludes the chapter.

4.2   EXPERIMENT DESIGN

The previous academic work and anecdotal evidence mentioned above show that gift-

giving can be an effective strategy to mitigate theft. The purpose of this experiment is to

determine how gift-giving, or resource transfers more generally, from potential victims to

takers influences decisions in a laboratory theft or taking game. The experiment took

place on the campus of the University of the Free State in South Africa. The University

of the Free State is a multi-campus institution. Participants were recruited from two of

these campuses for the experiment. The Bloemfontein campus of the University of the

Free State is a racially diverse environment. In contrast, the Qwaqwa campus is located

in a former "homeland" area of South Africa, and its student body is composed almost

entirely of black students. [53] In total, 362 students participated in the experiment. In exchange for participation, each student received a 20 Rand payment and the opportunity to earn additional money. At the time of the experiment, 7.3 ZAR was equivalent to 1 USD. Half of the participants were recruited from the Bloemfontein campus to play the role of receivers. Approximately half of these Bloemfontein student participants were white and half were black. An equal number of participants were recruited from the Qwaqwa campus to play the role of takers. Reflecting campus demographics, these students all identified themselves as black.

This experiment is part of a larger study on theft. One objective of this larger study is to understand how racial identity and inequality influence theft decisions. Although this is not the topic of this chapter, this experiment was conducted in conjunction with work on identity and inequality. The implications for this experiment is a design that formed treatment groups by varying levels of inequality between players and by the race of the receiving player. As mentioned above, approximately half of the Bloemfontein participants identify themselves as black and the others identify themselves as white. Levels of inequality were created by allowing Bloemfontein participants to earn an additional payment by completing a word scramble task. Completing this task earned individuals an additional 30 or 50 Rand. Although this additional payment was randomly determined, neither the Bloemfontein participants nor their partners had this knowledge. This payment was described as earnings to solidify the Bloemfontein player's ownership of this additional payment. Variation in these two factors created four

---

[53] A homeland refers to lands allocated to black ethnic groups during the apartheid era.

groups that differed based on the race of the receiver (i.e. victim) and the level of inequality between players. These groups are summarized in Table 4.1.

Participant pairings were made between campuses, and so the individuals in each pair never actually met in person. Rather, Bloemfontein participants were recruited via email and participated online. After completing the word scramble task, Bloemfontein participants learned that they were paired with another player. They also learned how much *real* money they had been allotted to begin the study as well as the smaller amount their unknown partner had been allotted. Bloemfontein participants were then asked to make one decision. This decision was similar to a dictator game decision. Bloemfontein participants were allowed to transfer up to 15 Rand from their additional payment to the other player.[54] The decisions made by Bloemfontein participants are not the focus of our interest and are not discussed further. These decisions are mentioned because this "transfer information" was presented to Qwaqwa participants to generate a reciprocal response. After making this decision, Bloemfontein players then provided their surname and other demographic data. Surnames were then used to convey racial identity to partners in Qwaqwa.[55]

In contrast to the online participation by Bloemfontein students, Qwaqwa students were recruited via student-to-student recruiting, classroom announcements and signs

---

[54]The word transfer is used to describe varied phrasing in the actual study. Approximately 67 percent of the Bloemfontein participants were presented with the opportunity to "give" up to 15 Rand to the other player. Half of this first group of Bloemfontein participants also learned that their partner would be able to take an additional 15 Rand from their endowment after receiving the gift. The remaining 33 percent of the Bloemfontein participants were presented with the opportunity to "pay" the other player up to 15 Rand. In the "pay" treatment, Bloemfontein participants were also aware that the other player would be able to take an additional 15 Rand after receiving the payment. The purpose of this variation is to determine if framing the transfer either as a gift, bribe or payment influences the behavior of either the "giver" or the "taker".
[55] See Appendix A for a list of black- and white-sounding surnames from Van Der Merwe and Burns (2008).

posted on campus. These students participated in the study during one of ten

classroom/laboratory experimental sessions. First students in Qwaqwa learned that they

were participating in games with real monetary payoffs, that they were already paired

with a student from another university campus and at that least one of their decisions

would have implications for both their payoffs and those of the players with whom they

were paired. Qwaqwa players then began the decision-making portion of the study.

The decision-making portion of the study consists of several related decisions.

First, all Qwaqwa participants decide how much to take in the baseline condition,

followed by several similar decisions in the transfer condition. In the baseline condition,

Qwaqwa participants are reminded of their own participation payment and learn the

surname and payment earned by the Bloemfontein player with who they are paired.

Without any additional information, Qwaqwa players then decide how much money they

would like to take from the other player. The exact text presented to Qwaqwa players in

the low-inequality baseline treatment is in Table 4.2. The text for the high-inequality

baseline treatment is identical except for the larger additional payment paid to student A.

After answering the question in Table 4.2, Qwaqwa players then turn the page to

proceed to additional decisions. These additional decisions are largely the same with

three notable exceptions. One important change is that Qwaqwa players are newly paired

with a different individual from within the same treatment group outlined in Table 4.1.

This ensures that the characteristics (i.e. receiver race and level of inequality) between

the two players have not changed.[56] Because new pairings have been made, the first

---

[56] Some players are likely able to infer a player's ethnicity from a surname. As the experiment design did not specifically control the ethnic makeup of dyads, this is a potential source of variation between the two

round decision should not influence the response to a new player in the subsequent

conditions. A second important change is that Qwaqwa participants now learn that the

Bloemfontein participant previously had the opportunity to transfer resources to them

under one of several frames. As mentioned above, the Bloemfontein players were given

the opportunity to offer a transfer (either a gift, bribe or payment) to the Qwaqwa player.

To be clear, the Bloemfontein players had the opportunity to offer a transfer and choose

its size, but they did not have the opportunity to choose which transfer type they would

offer (gift, bribe or payment). The gift frame states that the Bloemfontein player was

able to offer a gift and this person had no knowledge that the Qwaqwa player would later

be able to take resources from them. The bribe frame differs only slightly. In the bribe

frame, the Bloemfontein player knew the Qwaqwa player would be able to take resources

after learning the size of the voluntary resource transfer. Because the Bloemfontein

player knew the Qwaqwa participant would later be able to take resources, any transfer in

this frame could be perceived as a bribe. A final payment frame was identical to the gift

frame except language related to "give" or "gifts" was replaced by "pay" or "payment".

The purpose of this variation in framing was to determine if the perceived motivation of a

resource transfer influenced how it influenced the potential thief. A third important

difference between the transfer condition and the baseline condition is the opportunity to

respond to multiple transfer sizes within the transfer condition. The purpose for this

difference is two-fold. On one hand, asking potential takers to respond to transfers of

multiple sizes through the strategy method allowed the collection of additional data

points. Equally important was the desire to include the actual transfers offered by the

---

treatments.

Bloemfontein players. Before implementation, there was concern that there would be little variation in the actual transfers offered. To ensure responses to a wide range of transfer sizes, the choice of potential transfers was divided into three intervals. A small transfer included the [0, 3] interval. A medium transfer included the [4, 7] interval while a large transfer was on [8, 15].[57] As mentioned above, Bloemfontein participants were given the opportunity to offer any transfer size between zero and fifteen. Then, two additional transfers were generated from the uniform distribution over the two transfer intervals that were not selected by the Bloemfontein participant. This allowed each taker to respond to three different transfer sizes presented in random order. Although only one of these transfers was actually offered and might impact final payments, the Qwaqwa participant was unaware which transfer was volunteered. Although this portion of the experiment design is relatively complex from the experimenter's perspective, the information presented to participants is straightforward. An example of the low-inequality gift frame is presented Table 4.3. Underlining to highlight the appropriate transfer frame is to aid the reader and was not included in participant materials. The (low-inequality) bribe and payment frames are presented in Table 4.4 and Table 4.5 respectively.

After responding to these questions and other decisions discussed in the previous chapters, Qwaqwa participants completed a demographic questionnaire. After the experiment, one treatment was randomly selected to impact participant earnings. Earnings were then calculated and payments were made beginning the following week.

---

[57] In accordance with concerns at the design stage, over 40 percent of Bloemfontein participants offered the maximum transfer of 15 Rand. The average transfer was 9.6 Rand with 20, 10 and 70 percent of the actual transfers classified as small, medium and large respectively.

4.3 RESULTS

This section begins with a brief summary of the baseline treatment. This treatment is then compared to the transfer condition to shed light on the principal question of interest in this work—do transfers from potential theft victims to takers mitigate theft? To build on earlier results, responses to transfers are also examined with reference to the race of the potential victim. The analysis then shifts to focus on the size of the transfers, how size influences a taker's response and how this response ultimately impacts the potential victim. Finally, there is a brief discussion of how framing influences taking decisions. In general, results are presented visually, and non-parametric statistical tests are used examine differences between groups and/or treatment conditions. Later, econometric methods are used to control for additional variables of interest.

In the baseline treatment, takers had the opportunity to appropriate resources from another player. In this treatment, the mean amount taken from the victim was 10.4 Rand, or 69 percent of the vulnerable endowment. Also, as shown in chapter 2, black victims were significantly more vulnerable to theft than white victims. The baseline treatment serves as a comparison to determine how individuals adjust their taking in response to transfers from a potential victim. Recall that the taker was presented with three potential transfers of different sizes on the [0, 15] interval, only one of which was actually offered by the victim. The two additional transfers were randomly generated for the purpose of gathering additional responses to varied transfer sizes. Although the taker did not know which transfer the victim had actually offered, the taker did know that one of the three transfers was real and would be honored if this treatment was selected for payment. One

question of interest in this work is how takers respond to transfers in general, and whether

responses vary based on the transfer size. Figure 4.1 provides answers to both questions.

The first column of Figure 4.1 represents the mean amount (10.4 Rand) taken

from victims in the baseline condition. The next column represents takers' responses to

small transfers between zero and three Rand. In response to a small transfer, takers

reduced the mean amount they took to 8.3 Rand. A medium transfer between four and

seven Rand was slightly more effective in reducing taking. The mean amount taken in

response to a medium transfer is 7.8 Rand. The mean response to a large transfer

between eight and fifteen Rand is also 7.8 Rand. The responses to each transfer size are

each significantly different from to the baseline condition at the $p < 0.01$ level, using the

Wilcoxon signed-rank test. However, the differences in responses to the three questions

are indistinguishable from one another by the Friedman test ($p = 0.50$). Likewise, the

Wilcoxon signed-rank test is unable to detect a significant difference in responses to any

two transfer sizes.

A separate analysis of the baseline condition shows that racial identity influences

decision making with respect to taking. Figures 4.2 and 4.3 demonstrate how takers

respond in the baseline condition and to the three transfer sizes if they were paired with

either white receivers or black receivers. Figure 4.2 and Figure 4.3 offer information

similar to Figure 4.1. Although the level of taking in the baseline condition is greater

when takers are paired with black receivers, a resource transfer of any size influences

takers to appropriate less when paired with either race. Those paired with white receivers

reduce the amount they take in response to a resource transfer by approximately two

Rand. Those paired with black receivers follow a similar but visually more pronounced pattern reducing the average amount appropriated by nearly three Rand. A more illustrative way to view differences in the *reduction in taking* by receiver race due to transfers is presented in Figure 4.4.

Figure 4.4 shows that reductions in taking are more pronounced for those paired with black receivers at each transfer size. The differential impact by race ranges from less than one-half Rand in the small transfer case to nearly two Rand in the medium transfer case. Only in the medium transfer case does the difference in responses by receiver race approach statistical significance (Mann-Whitney U test, p-value = 0.09). Corresponding p-values for the small and large transfers are 0.87 and 0.51 respectively.

Figures 4.1 through 4.4 above demonstrate how individuals respond to resource transfers from potential theft victims. In each case, the mean response is to reduce taking after a resource transfer. Although the differences by race are not generally statistically significant, it appears that takers paired with black receivers are more influenced by resource transfers than those paired with white receivers. Even though transfers reduce taking, theft mitigation depends on whether potential victims can enhance their own payoffs by transferring resources to potential thieves. Figure 4.5 and the following discussion suggest that small resource transfers can be an effective theft deterrent for the potential victim. However, larger transfers lead to greater losses.

The mean loss in the baseline condition is 10.4 Rand. The mean total loss in the small transfer condition, including the transfer offered and the ensuing appropriation, falls to 9.5 Rand. On average, a small [0, 3] Rand transfer to a potential thief reduces

overall losses by nearly one Rand. Interestingly, offering just a one Rand transfer yields

the greatest benefit by reducing overall losses to 7.5 Rand on average—a 28 percent

decrease from the baseline condition. Transfers up to three Rand do provide benefits

relative the baseline scenario. On average any transfer in excess of three Rand results in

greater losses for the potential theft victim. The difference between the baseline

condition and the small transfer condition is significant at the $p = 0.04$ level by the

Wilcoxon signed-rank test. The more pronounced differences between the baseline and

the medium transfer condition as well as the baseline and large transfer condition each

yield p-values of less than 0.01.

As discussed above, transfers from the potential victim to the taker do influence

taking decisions. The general result is that offering a transfer reduces the amount that

individuals choose to take, although it does not necessarily reduce a victim's total losses.

Whether a transfer is offered influences decision making but there is no significant

difference in taking behavior based on the three size categories selected in the design

stage of the experiment. This finding is true whether individuals are paired with white

receivers or black receivers. There is no significant evidence for a crowding-out effect

when monetary transfers are used to discourage taking. Offering a small transfer does

not encourage more taking relative to the baseline condition by crowding-out and

individual's intrinsic motivation to refrain from taking. This experiment was also

designed to test for differences in responses to transfers framed as gifts, bribes or

payments. Disaggregating the data along these frames yields similar results for each

transfer size. Although there is some variation in the responses to gifts, bribes or

payments within a given transfer size, the differences between these framings are not statistically significant. The Kruskal-Wallis tests yield p-values of 0.73, 0.24 and 0.72 for the small, medium and large transfers respectively. Likewise, within a gift, bribe or payment frame the Friedman test was unable to detect a difference between responses to a small, medium or large transfer. The p-values are 0.22, 0.62 and 0.68 respectively. The mean taking data in response to a given transfer frame and size as well as the associated p-values are presented in Table 4.6.

In summary, the results of the non-parametric analysis show that transfers from potential victims to takers reduce taking. Whether a transfer has been made influences taking decisions, but the size of such transfers does not appear to play a large role. Additionally, takers paired with black receivers appear more responsive to transfers, although these differences are not significant at conventional levels. Examining total losses, including any transfer from the potential victim to the taker and the subsequent appropriation, shows that only small transfers are successful in reducing a potential victim's losses due to theft. There is no significant evidence that the transfer frame or the size of the transfer influence taking decisions. In the following section, econometric methods are used to examine the same questions while controlling for additional variables of interest.

Econometric Results

Ordinary least squares (OLS) is first compared to random effects (RE) and fixed effects (FE) specifications to account for the panel nature of the data set. After

examining these three model types, the most appropriate is used for a more thorough

analysis, using a tobit specification. Recall that the dependent variable of interest, the

amount the taker appropriates, is limited to the [0, 15] interval. Tobit models are used to

account for censoring in the data. Previous experimental work in South Africa related to

dictator type games provides guidance on appropriate controls (Burns, 2004). The

baseline treatment considered victim race and the level of inequality between players.

Variables are included to account for these treatment conditions. Additional variables

quantify the effect of: perceived opportunities for one's racial group; highest level of

education of the parents; the race of one's closest friends; perceived relative income;

devoutness to one's religion and whether one has been a victim of theft. Standard

experimental economics controls such as sex, age and the number economics courses

taken by the decision maker are also included, as are a series of dummy variables

indicating the ethnic identity of the potential victim. An additional dummy variable is

included to indicate whether a particular decision was made in the baseline condition.

More importantly, two variables were added to capture the influence of transfers from

potential victims to takers. A dummy variable denoting whether a positive transfer was

offered and an additional variable denoting transfer size in excess of the smallest positive

transfer (one Rand) were added to the model. Together, these two variables capture the

impact of any transfer as well as transfers of increasing size.

The results of the base models are presented in Table 4.7. Overall, the OLS and

RE models are similar. The FE model is also similar with respect to the effects of

transfers. Coefficients and significance levels in the FE specification differ with respect

to the ethnicity dummy variables included in the regressions. As most of the explanatory

variables are invariant over the panel, most of the coefficients are not comparable under

the FE specification. The three variables of greatest interest relate to the transfer

condition and whether a transfer is offered. The baseline coefficient is small and

insignificant, suggesting that individuals are not influenced by the condition itself.

Rather, takers are influenced by the actions of the potential victim in this condition. Any

positive transfer discourages taking and is highly significant. Interestingly, the size of the

transfer plays little role with larger transfers slightly *increasing* the amount a taker

chooses to appropriate. As in work related to theft in South Africa (described in chapter

2), white receivers are significantly less vulnerable to taking. Perceiving fewer

opportunities for one's racial group is also associated with *less* taking. Interestingly, the

results above differ from previous work in several ways. Parental education does not

have a significant influence on taking, while having been a victim of theft reduces taking.

Curiously, rating religion as being *less* important in one's life is also associated with less

taking. Marginally significant predictors associated with more taking include having a

close friend of a different race, being younger and having taken more economics classes.

Although each of the three models presented in Table 4.7 yields similar results with

respect to the treatment variables, specification tests favor the RE specification. Using a

Bruesh-Pagan test to detect the presence of random effects (RE) yields a p-value of less

than 0.01. This highly significant result indicates that RE is preferred over OLS.

Conversely, the Hausman test yields a p-value of 0.49, providing little evidence in favor

of FE over RE. In order to estimate the coefficients associated with invariant predictors,

and to account for the censored dependent variable, the remainder of the analysis will employ RE tobit models. The random effects model is presented in Table 4.7, and three additional RE tobit specifications are included in Table 4.8.

The results of the RE tobit (1) largely parallel those of the RE model presented in Table 4.7. Some coefficients differ due to the censored nature of the data. In the RE tobit, the impact of the baseline condition is again small and insignificant, while offering any positive transfer amount is associated with nearly a five Rand reduction in taking. Offering transfers exceeding one Rand is again associated with a slight increase in the amount taken. As discussed in chapter 2, white receivers in the experiment are less vulnerable to theft. In the RE tobit specification, the difference is nearly 2.5 Rand. Again, takers who perceive fewer opportunities for their own racial group appropriate less. Takers who have been victims of theft, are older or rate religion as being *less* important in their lives take less, although these effects are only marginally significant. A number of variables included in the RE tobit (1) and the linear RE model are not significant predictors of taking. To simplify results, insignificant predictors were omitted. The resulting model is RE tobit (2). This model retains the variables with significant coefficients described above and otherwise changes little. A likelihood ratio test was conducted to determine if the smaller specification reduces the fit of the model.[58] A p-value of 0.64 provides little evidence that the larger model is preferred.

---

[58] A number of individuals did not indicate the number of economics courses they had taken or the race of their closest friends. These 32 individuals were excluded from the likelihood ratio test. This exclusion permitted the likelihood ratio test to be completed with a sample common to both specifications. Omitting these individuals did not appreciably change results.

RE tobit (3) is also included in Table 4.8. The purpose of this model is to understand whether takers respond differently to transfers from black or white victims. This model differs from RE tobit (2) in that a dummy variable has been added to indicate that a taker is paired with a black victim and has been offered a positive transfer. The additional dummy variable in RE tobit (3) is not significant at standard thresholds (p = 0.13). It does suggest, however, that although individuals take less from white victims, they reduce taking from black victims to a greater extent in response to positive transfers. Albeit puzzling, this result also corroborates the findings in chapter 3. Recall that although takers take less from white victims, they respond more strongly to increased costs of theft paid by the victim when the victim is black. The econometric analysis conducted thus far corroborates the principal non-parametric findings that transfers are effective in reducing taking, although the size of the transfer is of little importance. The paragraphs below extend this analysis by examining how the framing of a transfer might influence taking decisions.

One additional model, RE tobit (4), is presented in Table 4.9. This model and its results are similar to RE tobit (2) except for the addition of six dummy variables. These dummy variables are meant to determine how the framing of a transfer influences taking. Two of these dummy variables denote whether a taker was in the bribe or payment frame instead of the gift frame. Two additional variables are formed by interacting the transfer frame dummy variables just described with the dummy variable indicating that a positive transfer was offered. The final two dummies are formed by interacting the transfer frame

dummies with the additional transfer variable that measures of the influence of transfers as they increase in size.

These six dummy variables, although at most marginally significant, provide new and intriguing information. First, the bribe and payment frame dummies indicate that exposure to the bribe or payment frame is associated with taking approximately two fewer Rand relative to the gift frame. This is somewhat surprising as one might expect the gift frame to be viewed more favorably. Given this finding, the coefficients on the interactions of the payment frame and the bribe frame with the positive transfer variable are puzzling. If the payment and bribe frames encourage less taking relative to the gift frame when no transfer is offered, one might expect a positive transfer in one of these frames to also reduce taking relative to the gift frame. The result is the opposite. When receivers are offered a positive transfer in the bribe or payment frame, they respond by taking nearly two Rand more relative to a positive transfer in the gift frame. To reiterate this point, being treated in the bribe or payment frame results in taking approximately two fewer Rand relative to the gift frame when no transfer if offered. Once a positive transfer is offered, individuals in all frames take less. However, when a positive transfer is offered, individuals take approximately two Rand more in the bribe and payment frames than in the gift frame. The final two dummy variables measure the effect of increasing transfer size in the bribe and payment frame relative to the gift frame. These variables are both small and insignificant.

Taken together, the results of the non-parametric and econometric analyses demonstrate that offering a transfer to a taker does reduce theft. Increasing the size of the

transfer has little effect on the amount appropriated. Although the framing results are intriguing, there is no significant evidence that the framing a transfer (as a gift, bribe or a payment) altered taking behavior relative to any other frame. To return briefly to the simple utility function outlined in the introduction to this chapter, this experiment shows that most individuals consider the kindness of an action in addition to material payoffs ($\rho > 0$). Because most individuals reduce the amount they take after any positive transfer, it is reasonable to assume that transfers were viewed kindly and individuals enhanced their welfare by reciprocating ($\varphi > 0$, $\sigma > 0$).

4.4   CONCLUSION

This chapter discusses the results of an economic experiment conducted in a laboratory setting at the University of the Free State in South Africa. The purpose of this study is to determine how "thieves" respond to resource transfers from potential victims in a taking game. In this one-shot interaction, we seek to determine whether resource transfers can be an effective deterrent to theft, and whether the size or framing of the transfer influences a potential thief's decision making.

The results of this experiment demonstrate that transfers from a potential theft victim to a potential thief can be an effective method to mitigate taking. Although whether a transfer is offered influences taking behavior, the size of the transfer itself has almost no impact of the amount a taker chooses to appropriate. Interestingly, taking slightly increases along with transfer size. Based on the results of this study, there is no evidence that small transfers crowd-out one's intrinsic motivation to refrain from taking.

89

An additional objective of this study was to determine whether framing a transfer either as a gift, bribe or payment influences a taker's response relative to any other frame. There is no significant evidence that framing influenced decision making in this study.

Overall, there is evidence that resource transfers can be effective theft deterrents, with the greatest benefit coming from small transfers. It is worth noting that this experiment captures only part of the context of the livestock theft anecdote mentioned in the introduction to this chapter. This experiment was designed to capture the influence of a resource transfer in a one-shot interaction. In the field, a resource transfer is likely accompanied by repeated interactions that could help build a trusting relationship. In the absence of repeated interactions, this study captures how these relationships may begin to form rather than how they mature. With respect to transfer sizes and crowding-out, it is possible that the permitted transfer sizes were not distinct enough to allow the influences of intrinsic and extrinsic motivation to be displayed. More importantly, the differences between the gift, bribe and payment treatments may not have been explicit enough to generate a statistically significant response. An appropriate next step is to offer a different population the opportunity to play a similar game with opportunities for repeated play to determine how the transfer relationship develops and stabilizes.

Table 4.1 Treatment Groups

Group (# of pairs)	Bloemfontein Participant			Qwaqwa Participant		
	Race	Participation Payment	Additional Payment	Race	Participation Payment	Additional Payment
WRHI[59] (43)	White	20 Rand	50 Rand	Black	20 Rand	0 Rand
WRLI (49)	White	20 Rand	30 Rand	Black	20 Rand	0 Rand
BRHI (41)	Black	20 Rand	50 Rand	Black	20 Rand	0 Rand
BRLI (48)	Black	20 Rand	30 Rand	Black	20 Rand	0 Rand

---

[59] WRHI refers to the White Receiver, High-Inequality treatment. The other groups are similarly identified.

Table 4.2 Baseline Question, Low-Inequality Treatment

****

Your participation payment is 20 Rand. The student A with whom you are paired will receive a participation payment of 20 Rand. In addition, student A has earned an additional payment of 30 Rand for completing a task. This information is summarized in the table below.

	You	Student A
Participation Payment	20 Rand	20 Rand
Additional Payment	0 Rand	30 Rand
Total	**20 Rand**	**50 Rand**

Student A's last name is _____.

It is possible for you to take money from the **additional payment** student A earned for completing a task.
How many Rand do you want to take from the money student A earned?

(Circle your answer below)

0   1   2   3   4   5   6   7   8   9   10   11   12   13   14   15[60]

****

---

[60] Because participants were promised at least 20 Rand for their time, takers were only allowed to take up to 15 Rand from the victim. This ensures that victims in the low-inequality treatment (as shown here) receive the promised 20 Rand even if the taker appropriates all 15 Rand in separate (double penalty) condition.

Table 4.3 Gift Question, Low-Inequality Treatment

****

You are now paired with a different student A. Again, consider the following table.

	You	**Student A**
Participation Payment	20 Rand	20 Rand
Additional Payment	0 Rand	30 Rand
Total	**20 Rand**	**50 Rand**

Student A's last name is _____.

Student A was given the opportunity to <u>give</u> you up to 15 Rand from their **additional payment**. Student A offered this <u>gift</u> **without** knowing that you can take from them.

One of the cases below is student A's real <u>gift</u> to you. Only the real <u>gift</u> can impact final earnings. You do not know which of these <u>gifts</u> was actually offered so you should answer each part of this question as if that <u>gift</u> was student A's real <u>gift</u> to you.

    a. Suppose student A <u>gave</u> you _____ Rand from their **additional payment**.
        You will receive this <u>gift</u> from student A. In addition to the <u>gift</u> from student A, it is possible for you to take money from the **additional payment** student A earned for completing a task. How many Rand do you want to take from the money student A earned?

(Circle your answer below)

0   1   2   3   4   5   6   7   8   9   10   11   12   13   14   15

    b. Suppose student A <u>gave</u> you _____ Rand from their **additional payment**.
        You will receive this <u>gift</u> from student A. In addition to the <u>gift</u> from student A, it is possible for you to take money from the **additional payment** student A earned for completing a task. How many Rand do you want to take from the money student A earned?

(Circle your answer below)

0   1   2   3   4   5   6   7   8   9   10   11   12   13   14   15

    c. Suppose student A <u>gave</u> you _____ Rand from their **additional payment**.
        You will receive this <u>gift</u> from student A. In addition to the <u>gift</u> from student A, it is possible for you to take money from the **additional payment** student A earned for completing a task. How many Rand do you want to take from the money student A earned?

(Circle your answer below)

0   1   2   3   4   5   6   7   8   9   10   11   12   13   14   15
****

Table 4.4 Bribe Question, Low-Inequality Treatment

****

You are now paired with a different student A. Again, consider the following table.

	You	**Student A**
Participation Payment	20 Rand	20 Rand
Additional Payment	0 Rand	30 Rand
Total	**20 Rand**	**50 Rand**

Student A's last name is _____.

Student A was given the opportunity to <u>give</u> you up to 15 Rand from their **additional payment**. Student A offered this <u>gift</u> **with** the knowledge that you can take from them.

One of the cases below is student A's real <u>gift</u> to you. Only the real <u>gift</u> can impact final earnings. You do not know which of these <u>gifts</u> was actually offered so you should answer each part of this question as if that <u>gift</u> was student A's real <u>gift</u> to you.

     a.   Suppose student A <u>gave</u> you _____ Rand from their **additional payment**.
        You will receive this <u>gift</u> from student A. In addition to the <u>gift</u> from student A, it is possible for you to take money from the **additional payment** student A earned for completing a task. How many Rand do you want to take from the money student A earned?

(Circle your answer below)

0   1   2   3   4   5   6   7   8   9   10   11   12   13   14   15

     b.   Suppose student A <u>gave</u> you _____ Rand from their **additional payment**.
        You will receive this <u>gift</u> from student A. In addition to the <u>gift</u> from student A, it is possible for you to take money from the **additional payment** student A earned for completing a task. How many Rand do you want to take from the money student A earned?

(Circle your answer below)

0   1   2   3   4   5   6   7   8   9   10   11   12   13   14   15

     c.   Suppose student A <u>gave</u> you _____ Rand from their **additional payment**.
        You will receive this <u>gift</u> from student A. In addition to the <u>gift</u> from student A, it is possible for you to take money from the **additional payment** student A earned for completing a task. How many Rand do you want to take from the money student A earned?

(Circle your answer below)

0   1   2   3   4   5   6   7   8   9   10   11   12   13   14   15
****

Table 4.5 Payment Question, Low-Inequality Treatment

****
You are now paired with a different student A. Again, consider the following table.

	You	Student A
Participation Payment	20 Rand	20 Rand
Additional Payment	0 Rand	30 Rand
Total	**20 Rand**	**50 Rand**

Student A's last name is _____.

Student A was given the opportunity to <u>pay</u> you up to 15 Rand from their **additional payment**. Student A offered this <u>payment</u> **with** the knowledge that you can take from them.

One of the cases below is student A's real <u>payment</u> to you. Only the real <u>payment</u> can impact final earnings. You do not know which of these <u>payments</u> was actually offered so you should answer each part of this question as if that <u>payment</u> was student A's real <u>payment</u> to you.

  a. Suppose student A <u>paid</u> you _____ Rand from their **additional payment**.
      You will receive this <u>payment</u> from student A. In addition to the <u>payment</u> from student A, it is possible for you to take money from the **additional payment** student A earned for completing a task. How many Rand do you want to take from the money student A earned?

(Circle your answer below)

0   1   2   3   4   5   6   7   8   9   10   11   12   13   14   15

  b. Suppose student A <u>paid</u> you _____ Rand from their **additional payment**.
      You will receive this <u>payment</u> from student A. In addition to the <u>payment</u> from student A, it is possible for you to take money from the **additional payment** student A earned for completing a task. How many Rand do you want to take from the money student A earned?

(Circle your answer below)

0   1   2   3   4   5   6   7   8   9   10   11   12   13   14   15

  c. Suppose student A <u>paid</u> you _____ Rand from their **additional payment**.
      You will receive this <u>payment</u> from student A. In addition to the <u>payment</u> from student A, it is possible for you to take money from the **additional payment** student A earned for completing a task. How many Rand do you want to take from the money student A earned?

(Circle your answer below)

0   1   2   3   4   5   6   7   8   9   10   11   12   13   14   15
****

Table 4.6 Mean Taking Response by Transfer Frame and Size

		Transfer Size			
		Small	**Medium**	**Large**	**Friedman p-value**
Transfer Frame	**Gift**	8.57	7.20	8.13	0.22
	Bribe	8.20	7.69	7.58	0.62
	Payment	7.98	8.39	7.64	0.68
	Kruskal-Wallis p-value	0.73	0.24	0.72	

Table 4.7 Econometric Results, OLS, Random Effects and Fixed Effects

Dependent Variable: Amount taken	β	p-value	β	p-value	β	p-value
	SE		*SE*		*SE*	
	OLS (1)		RE (2)		FE (3)	
Constant	15.39	0.00	15.28	0.00	9.83	0.00
	2.16		*2.65*		*0.74*	
Receiver is white	-1.95	0.01	-1.87	0.02	-	-
	0.71		*0.80*		-	
High-inequality	0.50	0.18	0.49	0.29	-	-
	0.37		*0.46*		-	
Own racial group has fewer opportunities[61]	-0.57	0.01	-0.57	0.04	-	-
	0.22		*0.28*		-	
Parent education[62]	-0.02	0.88	-0.01	0.93	-	-
	0.12		*0.15*		-	
Close friends w/ person of another race	0.74	0.06	0.75	0.13	-	-
	0.40		*0.49*		-	
Perceived economic situation[63]	0.44	0.19	0.46	0.27	-	-
	0.33		*0.41*		-	
Religion is less important	-0.42	0.08	-0.42	0.15	-	-
	0.24		*0.29*		-	
Theft Victim	-0.91	0.02	-0.90	0.06	-	-
	0.38		*0.47*		-	
Male	-0.00	0.99	-0.02	0.96	-	-
	0.39		*0.48*		-	
Age	-0.18	0.04	-0.18	0.08	-	-
	0.08		*0.10*		-	
Number of economics courses	0.29	0.08	0.29	0.15	-	-
	0.16		*0.20*		-	
Receiver is Afrikaner	0.97	0.14	0.96	0.17	0.95	0.31
	0.65		*0.70*		*0.94*	
Receiver is Zulu	0.08	0.93	0.19	0.84	0.47	0.70
	0.89		*0.94*		*1.20*	
Receiver is Xhosa	-0.22	0.76	-0.29	0.71	-0.35	0.73
	0.72		*0.77*		*1.04*	
Receiver is Sotho	-1.00	0.08	-0.73	0.24	0.26	0.78
	0.57		*0.63*		*0.95*	
Baseline condition	0.13	0.85	0.17	0.80	0.21	0.75
	0.70		*0.66*		*0.68*	
Any positive transfer	-3.17	0.00	-3.14	0.00	-3.13	0.00
	0.71		*0.68*		*0.72*	
Additional transfer (for transfers >1)	0.09	0.06	0.09	0.05	0.09	0.07
	0.05		*0.05*		*0.05*	
N	637		637		637	

---

[61] Respondents chose from *Strongly Agree (1)*, *Agree (2)*, *Don't Know (3)*, *Disagree (4)* and *Strongly Disagree (5)*.

[62] Nine respondents did not know the highest level of education achieved by their parents. These respondents were assigned the modal response of *Some general education but did not complete grade 9*.

[63] Respondents were asked to choose between *Better off (1)*, *About the same (2)*, *Worse off (3)* or *Don't Know*. *Don't Know* responses were coded as *About the same*.

Table 4.8 Econometric Results, Random Effects Tobits

Dependent Variable: Amount taken	β SE	p-value	β SE	p-value	β SE	p-value	β SE	p-value
	RE (2)		RE Tobit (1)		RE Tobit (2)		RE Tobit (3)	
Constant	15.28	0.00	19.67	0.00	19.81	0.00	20.24	0.00
	2.65		3.58		3.11		3.13	
Receiver is white	-1.87	0.02	-2.39	0.03	-1.13	0.08	-2.16	0.02
	0.80		1.10		0.64		0.94	
High-inequality	0.49	0.29	0.44	0.48	-	-	-	-
	0.46		0.62		-		-	
Own racial group has fewer opportunities	-0.57	0.04	-0.82	0.03	-0.71	0.06	-0.70	0.06
	0.28		0.37		0.37		0.37	
Parent education	-0.01	0.93	-0.08	0.70	-	-	-	-
	0.15		0.20		-		-	
Close friends w/ person of another race	0.75	0.13	0.93	0.16	-	-	-	-
	0.49		0.66		-		-	
Perceived economic situation	0.46	0.27	0.58	0.30	-	-	-	-
	0.41		0.56		-		-	
Religion is less important	-0.42	0.15	-0.65	0.10	-0.63	0.12	-0.63	0.12
	0.29		0.40		0.41		0.41	
Theft Victim	-0.90	0.06	-1.13	0.08	-1.02	0.11	-1.02	0.11
	0.47		0.64		0.64		0.64	
Male	-0.02	0.96	-0.08	0.90	-	-	-	-
	0.48		0.65		-		-	
Age	-0.18	0.08	-0.26	0.06	-0.21	0.13	-0.20	0.13
	0.10		0.14		0.13		0.14	
Number of economics courses	0.29	0.15	0.37	0.17	-	-	-	-
	0.20		0.27		-		-	
Receiver is Afrikaner	0.96	0.17	1.16	0.23	-	-	-	-
	0.70		0.96		-		-	
Receiver is Zulu	0.19	0.84	0.33	0.80	-	-	-	-
	0.94		1.31		-		-	
Receiver is Xhosa	-0.29	0.71	-0.10	0.92	-	-	-	-
	0.77		1.08		-		-	
Receiver is Sotho	-0.73	0.24	-0.99	0.26	-	-	-	-
	0.63		0.87		-		-	
Baseline condition	0.17	0.80	0.04	0.97	-	-	-	-
	0.66		0.95		-		-	
Any positive transfer	-3.14	0.00	-4.73	0.00	-4.87	0.00	-4.11	0.00
	0.68		0.97		0.65		0.81	
Additional transfer (for transfers >1)	0.09	0.05	0.12	0.06	0.11	0.08	0.11	0.08
	0.05		0.06		0.06		0.06	
Any positive transfer when paired with black receiver	-	-	-	-	-	-	-1.52	0.13
	-		-		-		1.00	
N	637		637		637		637	

Table 4.9 Additional Econometric Results, Random Effects Tobit

Dependent Variable: Amount taken	β SE	p-value
	RE Tobit (4)	
Constant	21.19	0.00
	3.24	
Receiver is white	-1.11	0.08
	0.64	
Own racial group has fewer opportunities	-0.70	0.06
	0.37	
Religion is less important	-0.60	0.14
	0.41	
Theft Victim	-1.07	0.10
	0.65	
Age	-0.22	0.11
	0.14	
Any positive transfer	-6.20	0.00
	1.13	
Additional transfer (for transfers >1)	0.12	0.27
	0.11	
Payment frame	-1.66	0.15
	1.15	
Bribe frame	-2.00	0.08
	1.14	
Payment frame and any positive transfer	2.02	0.20
	1.59	
Bribe frame and any positive transfer	1.92	0.22
	1.57	
Payment frame and additional transfer (for payments >1)	-0.04	0.80
	0.15	
Bribe frame and additional transfer (for bribes >1)	0.01	0.95
	0.15	
N	662	

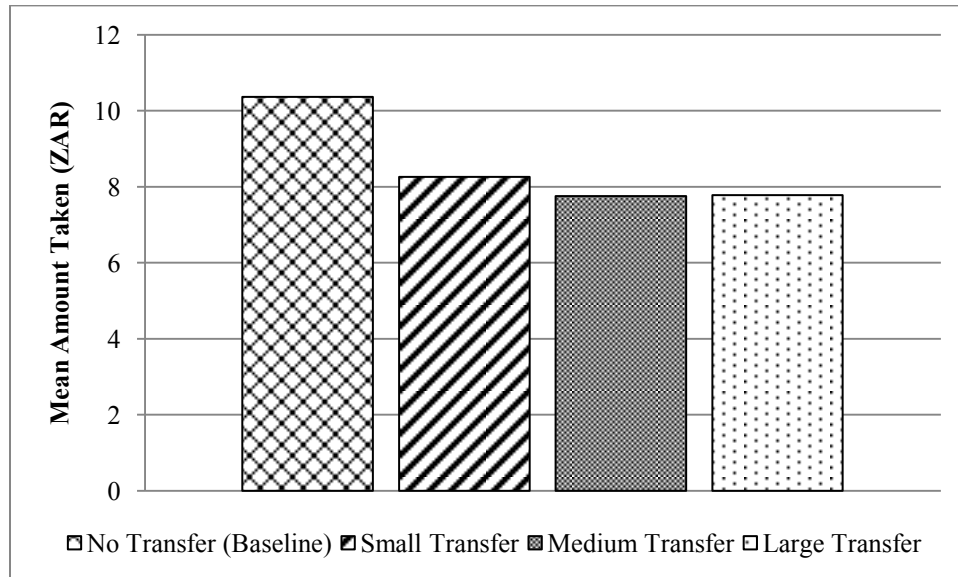**Figure 4.1 Mean Amount Taken by Transfer Size**

Figure 4.2 Mean Amount Taken by Transfer Size (White Receivers)
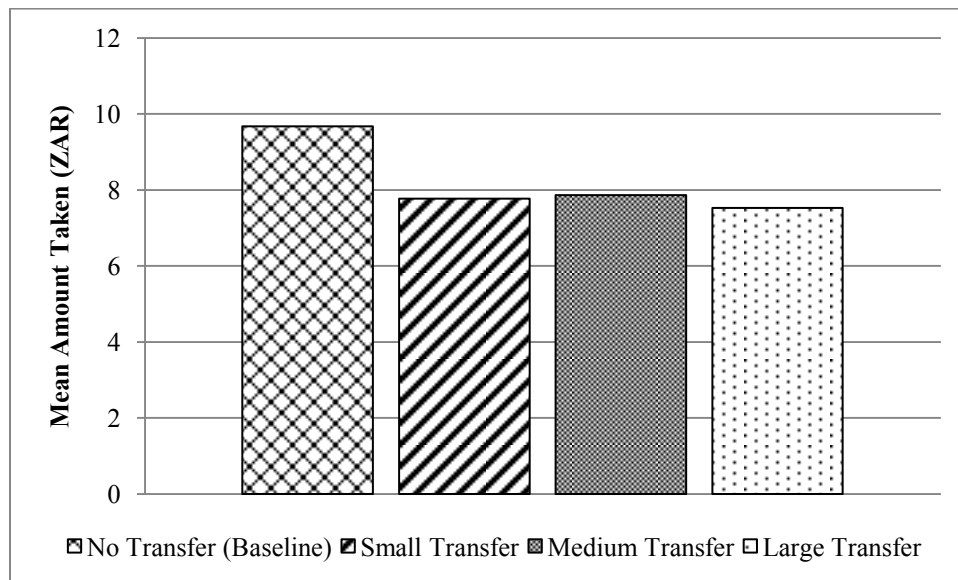
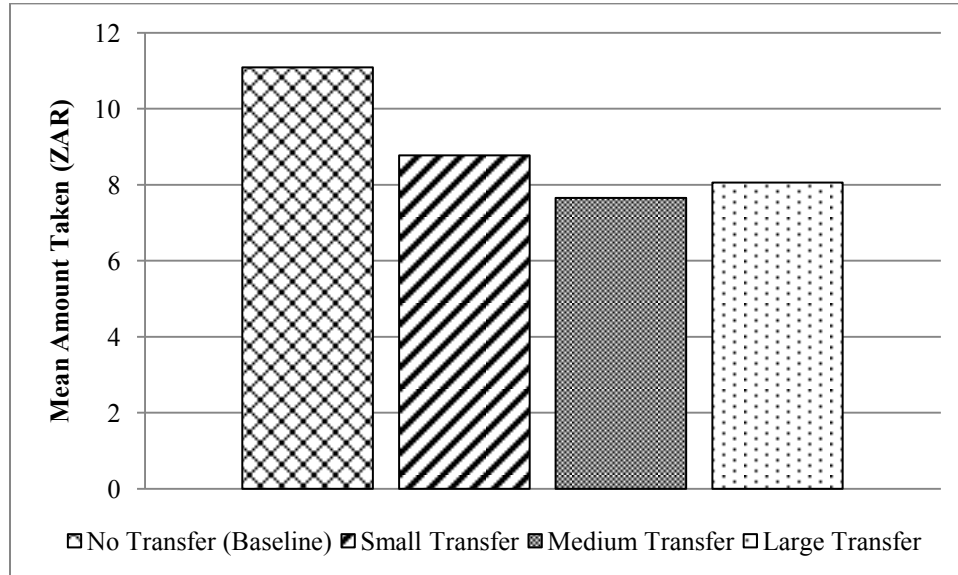**Figure 4.3 Mean Amount Taken by Transfer Size (Black Receivers)**

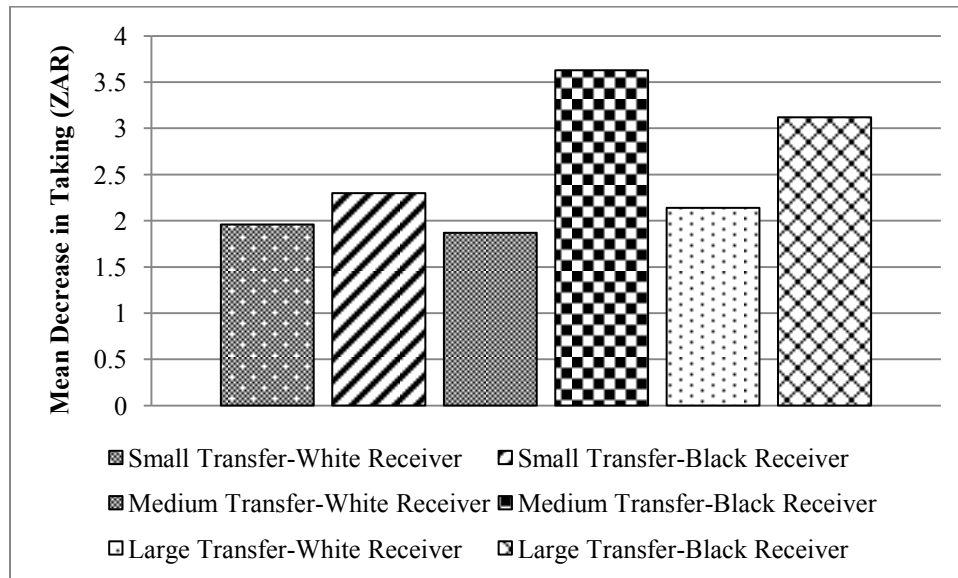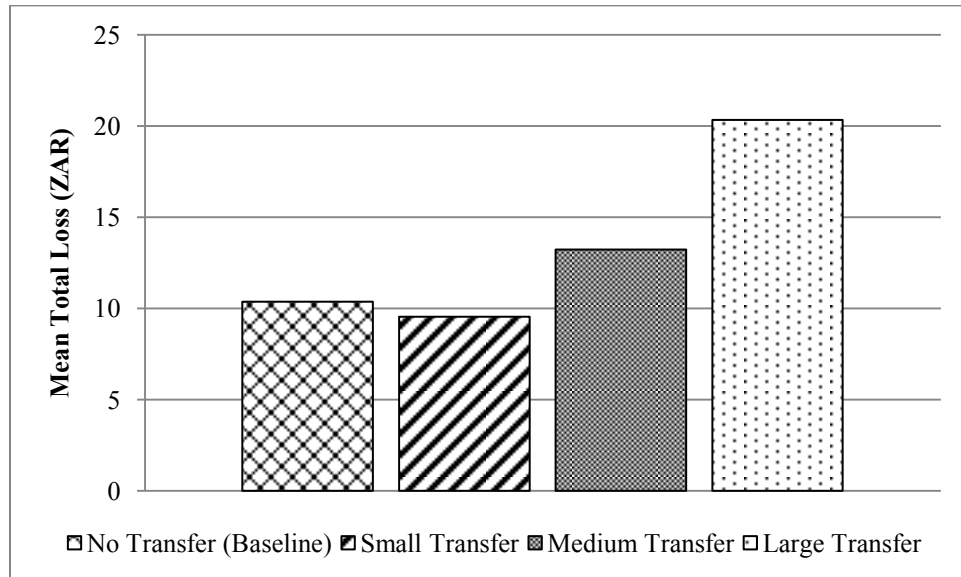**Figure 4.4 Mean Decrease in Taking by Transfer Size and Receiver Race**

Figure 4.5 Mean Total Loss by Transfer Size

CHAPTER 5

CONCLUSION

The purpose of this dissertation is to examine how identity influences decision making in the context of theft and how forces such as social preferences and reciprocity can be used for theft mitigation. Economic experiments conducted with South African university students are used to address these questions. South Africa was the location selected for this study as theft is a notable challenge and identity plays an important role in South African life. Chapters two through four are the body of this work and are briefly summarized below.

The second chapter of this dissertation focuses on the role of racial identity and inequality and how they influence theft. The principal finding of this chapter is that racial identity influences taking decisions. Contrary to previous work, which suggests that individuals favor those with whom they are more similar, black participants in the taking game choose to take more from black receivers than they did from white receivers. Despite contradicting results of similar dictator games, this finding highlights one reason that black individuals may be more vulnerable to theft. Although individuals choose to take more from those who had more, these differences in taking based on levels of inequality are not statistically significant.

The third chapter examines the price of taking "paid" by the victim and how changes in this price influence theft decisions. In this chapter, individuals first play a zero sum game taking game where any material gain for the thief is offset by an equal

loss to the victim. After participants are re-matched with another individual, the game is repeated in a slightly different context. Rather than having the gain to the thief be equal in size to the material losses experienced by the victim, victims now suffer losses that are double the size of the gains experienced by the thief. Although these losses are borne only by the theft victim, thieves reduce the amount they choose to take by nearly ten percent in the second situation.

The fourth chapter explores how thieves respond to resource transfers offered by potential victims before making theft decisions. Any resource transfer from a potential victim to a thief significantly reduces the amount taken. The size of the transfer has little influence on how much thieves choose to take. Increasingly large transfers slightly *increase* the amount taken. Framing a transfer as a gift, bribe or payment does not change the amount thieves choose to take after receiving the transfer.

These chapters demonstrate that identity, the welfare of others and reciprocity influence decision making in a laboratory taking game. Although these findings may appear to be applicable to immediate policy challenges, caution is in order. Rather than launching full-scale programs to mitigate theft by reducing social distance between individuals, publicizing the efficiency losses of property crime and encouraging gift-giving between potential theft victims and perpetrators, it would be prudent to view these experiments as a precursor to a field experiment or pilot project. Not only could such a project corroborate these laboratory findings, it could also answer practical questions such as how a gift relationship matures over time and how much personal interaction is required to develop a trusting relationship that extends beyond theft mitigation. In

104

addition to the potential that these experiments can ultimately influence policy, this work

provides an interesting basis for future research. One area of particular interest is

developing similar games that mirror the incentive structure of other policy challenges

such as corruption or charitable contributions. Alternative representations of identity,

such as ethnicity, can also be explored to examine their role in decision making.

BIBLIOGRAPHY

Akerlof, George, and Rachel Kranton. 2000. Economics and Identity. *The Quarterly Journal of Economics* 115, (3): 715-753.

Alesina, Alberto, and Eliana La Ferrara. 2002. Who trusts others? *Journal of Public Economics* 85, (2): 207-234.

Andreoni, James, and John Miller. 2002. Giving according to GARP: An experimental test of the consistency of preferences for altruism. *Econometrica* 70, (2): 737-753.

Ashraf, Nava, Iris Bohnet and Nikita Piankov. 2003. Is trust a bad investment? [unpublished paper]

Bardsley, Nicholas. 2008. Dictator game giving: altruism or artefact? *Experimental Economics* 11, (2): 122-133.

Becker, Gary. 1968. Crime and punishment: An economic approach. *The Journal of Political Economy* 76, 169-217.

Ben-Ner, Avner, and Amit Kramer. 2009. Dominance of deep- over surface-level identity similarity: Experimental evidence from simultaneous presentation of multiple identities. [unpublished paper]

Berg, Joyce, John Dickhaut, and Kevin McCabe. 1995. Trust, reciprocity, and social history. *Games and Economic Behavior* 10, (1): 122-42.

Bertrand, Marianne, and Sendhil Mullainathan. 2004. Are Emily and Greg more employable than Lakisha and Jamal? A field experiment on labor market discrimination. *The American Economic Review* 94, (4): 991-1013.

Bolton Gary, and Axel Ockenfels. 2000. ERC: A theory of equity, reciprocity, and competition. *The American Economic Review* 90, (1): 166-193.

Brand, Arnold. "Regional Review of Policy Developments in the Meat and Feed Sector and Farmers' Positions" (presentation) http://www.rpo.co.za/index.php?option=com_content&view=article&id=64&Itemid=45 (accessed January 20, 2010).

Burns, Justine. 2006. Racial stereotypes, stigma and trust in post-apartheid South Africa. *Economic Modelling* 23, (5): 805-821.

———. 2004. Inequality aversion and group identity in a segmented society. [unpublished paper]

Camerer, Colin. *Behavioral game theory: Experiments in strategic interaction.* Princeton, NJ: Princeton University Press, 2003.

Carter, Michael, and Marco Castillo. 2003. An experimental approach to social capital in South Africa. [unpublished paper]

Charness, Gary, and Matthew Rabin. 2002. Understanding social preferences with simple tests. *The Quarterly Journal of Economics* 117, (3): 817-869.

Cherry, Todd, Peter Frykblom and Jason Shogren. 2002. Hardnose the dictator. *The American Economic Review* 92, (4): 1218-1221.

Deci, Edward. 1971. Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology* 18, (1): 105-115.

Demombynes, Gabriel, and Berk Özler. 2005. Crime and local inequality in South Africa. *Journal of Development Economics* 76, (2): 265-292.

Dufwenberg, Martin, and Georg Kirchsteiger. 2004. A theory of sequential reciprocity. *Games and Economic Behavior* 47, 163-82.

Falk, Armin. 2007. Gift exchange in the field. *Econometrica* 75, (5): 1501-11.

Falk, Armin, Ernst Fehr, and Urs Fischbacher. 2008. Testing theories of fairness--intentions matter. *Games and Economic Behavior* 62, (1): 287-303.

Falk, Armin, and Urs Fischbacher. 2006. A theory of reciprocity. *Games and Economic Behavior* 54, (2): 293-315.

———. 2002. "Crime" in the lab-detecting social interaction. *European Economic Review* 46, (4-5): 859-869.

Fehr, Ernst, Georg Kirchsteiger and Arno Riedl. 1993. Does fairness prevent market clearing? An experimental investigation. *The Quarterly Journal of Economics* 108, (2): 437-459.

Fehr, Ernst, and Klaus Schmidt. 1999. A theory of fairness, competition, and cooperation. *The Quarterly Journal of Economics* 114, (3): 817-868.

Fehr, Ernst, and Urs Fischbacher. 2002. Why social preferences matter – The impact of non-selfish motives on competition, cooperation and incentives. *The Economic Journal* 112, (478): C1-C33.

Fershtman, Chaim, and Uri Gneezy. 2001. Discrimination in a segmented society: An experimental approach. *The Quarterly Journal of Economics* 116, (1): 351-377.

Forsythe, Robert, Joel Horowitz, N. E. Savin and Martin Sefton. 1994. Fairness in simple bargaining experiments. *Games and Economic Behavior* 6, (3): 347-369.

Frey, Bruno, and Felix Oberholzer-Gee. 1997. The cost of price incentives: An empirical analysis of motivation crowding-out. *American Economic Review* 87, (4): 746-55.

Gneezy, Uri and Aldo Rustichini. 2000. Pay enough or don't pay at all. *Quarterly Journal of Economics* 115, (3): 791-810.

Gneezy, Uri and John List. 2006. Putting behavioral economics to work: Testing for gift exchange in labor markets using field experiments. *Econometrica* 74, (5): 1365-1384.

Goeree, Jacob, Charles Holt and Susan Laury. 2002. Private costs and public benefits: Unraveling the effects of altruism and noisy behavior. *Journal of Public Economics* 83, (2): 255-276.

Grolleau, Gilles, Naoufel Mzoughi and Angela Sutan. 2009. The impact of envy related behaviors on development. *Journal of Economic Issues* 43, (3): 795-803.

Haile, Daniel, Abdolkarim Sadrieh and Harrie A. A. Verbon. 2008. Cross-racial envy and underinvestment in South African partnerships. *Cambridge Journal of Economics* 32, (5): 703-724.

Harrison, David, Kenneth Price and Myrtle Bell. 1998. Beyond relational demography: Time and the effects of surface- and deep-level diversity on work group cohesion. *The Academy of Management Journal* 41, (1): 96-107.

Hoffman, Elizabeth, Kevin McCabe, Keith Shachat, and Vernon Smith. 1994. Preferences, property rights and anonymity in bargaining games. *Games and Economic Behavior* 7, (3): 346-380.

Kahneman, Daniel, Jack Knetsch and Richard Thaler. 1986. Fairness as a constraint on profit seeking: Entitlements in the Market. *The American Economic Review* 76, (4): 728-741.

Khoabane, Selloane, and P. A. Black. 2009. The effect of livestock theft on household poverty in developing countries: The case of Lesotho. [Stellenbosch Economic Working Papers: 02/09]

Kimbrough, Erik, Vernon Smith and Bart Wilson. 2010. Exchange, theft and the social formation of property. *Journal of Economic Behavior and Organization* 74, (3): 206-229.

Knack, Stephen and Philip Keefer. 1997. Does social capital have an economic payoff? A cross-country investigation. *Quarterly Journal of Economics* 112, (4): 1251-1288.

List, John. 2007. On the interpretation of giving in dictator games. *Journal of Political Economy* 115, (3): 482-493.

Mellström, Carl, and Magnus Johannesson. 2008. Crowding out in blood donation: Was Titmuss right? *Journal of the European Economic Association* 6, (4): 845-863.

Oxoby, Robert, and John Spraggon. 2008. Mine and yours: Property rights in dictator games. *Journal of Economic Behavior and Organization* 65, (3-4): 703-713.

Republic of South Africa Department of Agriculture, Forestry and Fisheries, *Abstract of Agricultural Statistics 2009. 87.* http://www.daff.gov.za/ (accessed January 20, 2010).

Schechter, Laura. 2007. Theft, gift-giving, and trustworthiness: Honesty is its own reward in rural Paraguay. *The American Economic Review* 97, (5): 1560-1582.

Southern Africa Regional Poverty Network, *Facts sheet: Poverty in South Africa.* http://www.sarpn.org.za/documents/d0000990/ (accessed July 20, 2010).

Statistics South Africa, *Income and expenditure of households 2005/2006: Analysis of results.* http://www.statssa.gov.za/publications/statsdownload.asp?PPN=Report-01-00-01&SCH=4110 (accessed July 20, 2010).

The World Bank, *World development indicators.* http://search.worldbank.org/data?qterm=gini&language=EN&format=html (accessed July 20, 2010).

Titmuss, Richard. *The Gift Relationship*. London: Allen and Unwin, 1970.

Van Der Merwe, William, and Justine Burns. 2008. What's in a name? Racial identity and altruism in post-apartheid South Africa. *South African Journal of Economics* 76, (2): 1-10.

Zitek, Emily, Alexander Jordan, Benoît Monin, and Frederick Leach. 2010. Victim entitlement to behave selfishly. *Journal of Personality and Social Psychology* 98, (2): 245-255.

APPENDIX A

The following list of South African white-sounding surnames and black-sounding surnames is taken from Van Der Merwe and Burns (2008).[64] Although the names of the participants in this study differ to reflect the ethnic profile of the Free State, the difference between white-sounding names and black-sounding names remains distinct.

White-sounding surnames	Black-sounding surnames
Burman	Zakeyo
Griffin	Gozo
Higgins	Moyo
Hopwood	Mokowyane
Einhorn	Mokhine
Abbot	Makhalima
Krynauw	Nyemba
Martin	Mnwana
Bradfield	Matwa
Langmann	Khambule
Petersen	Mbeke
Helm	Chandalala
Rasmussen	Skosana
Giles	Mathibe
Butler	Sekhesa
Cohen	Mollo
Bartmann	Khoza
Neale	Mbanjwa
Sutherland	Dlamini
Fransman	Baisitse
Funke	Mabyang
Loxton	Bani
Krynauw	Manda
Hutton	Sifunda
Corrigan	Vusi
Hart	Giyose
Henshall-Howard	Viwe
Carr	Motsoaledi
Armstrong	Magudulela
Lloyd	Takalani
Stern	Magudulela
Meadon	Nthangeni
Pastoll	Sidumo
Watkins	Maketa
Smith	Zulu
Kartstel	Nyoni
Chandler	Kakana
Hurwitz	Mbonambi
Palmer	Cetshana
Alcock	Mokhine
Hosly	Khumalo
Ingwersen	Tsotetsi

---

[64] It is interesting to note that Van Der Merwe is viewed as the standard Afrikaans "anonymous name" akin to John Smith in the United States.

APPENDIX B

Survey – Demographic (response count or means in parentheses)

1. Are you male or female?
   ____*Male (90)*
   ____*Female (89)*

2. What is your age in years?_____ (mean = 21.3)

3. How many children do you have?
   ____*0 (144)*
   ____*1 (31)*
   ____*2 (3)*
   ____*3 (0)*
   ____*4 (0)*
   ____*5 (0)*
   ____*More than 5 (0)*

4. What is your marital status?
   ____*Single-Never Married (177)*
   ____*Married (1)*
   ____*Separated (0)*
   ____*Divorced (0)*
   ____*Widowed (0)*

5. What is your race?
   ____*Black (179)*
   ____*White (0)*
   ____*Coloured (0)*
   ____*Asian (0)*
   ____*Other (0)*

6. What is your ethnic group? (You may choose more than one.)
   ____*Zulu (97)*
   ____*Xhosa (8)*
   ____*Sotho (95)*
   ____*Tswana (15)*
   ____*Venda (0)*
   ____*British (6)*
   ____*Afrikaner (3)*
   ____*Asian (2)*
   ____*Other (specify)* _____ *(5)*

7. What language do you speak in your home? (You may choose more than one.)

____Zulu (109)
____Xhosa (9)
____Sotho (106)
____Setswana (10)
____Venda (0)
____English (58)
____Afrikaans (3)
____Tamil (0)
____Hindi (0)
____Other (specify) _____ (0)

8. Consider your three closest friends outside your family. These friends are:

____my race (109)
____another race (32)
____not all the same race (35)

9. Consider your family's economic situation. Compared to other South Africans, how would you classify your family?

____Better off (29)
____About the Same (103)
____Worse off (35)
____Don't Know (0)

10. Consider your family's economic situation. Compared to other South Africans **of your race**, how would you classify your family?

____Better off (25)
____About the Same (111)
____Worse off (20)
____Don't Know (0)

11. Consider your family's economic situation. Compared to South Africans **of other races**, how would you classify your family?

____Better off (22)
____About the Same (58)
____Worse off (58)
____Don't Know (1)

12. My racial group has good opportunities to get ahead in South Africa.

____Strongly Agree (50)
____ Agree (100)
____Don't Know (12)
____Disagree (16)
____ Strongly Disagree (2)

13. Has a member of your family had difficulty finding employment?
    _____*Yes (157)*
    _____*No (20)*
    _____*Don't Know (0)*

14. If your father is working, what is his occupation?

    _____

15. If your mother is working, what is her occupation?

    _____

16. What is the **highest** level of education completed by either of your parents?
    _____*Some general education but did not complete grade 9 (49)*
    _____*Completed grade 9 (14)*
    _____*Some further education but did not complete grade 12 (38)*
    _____*Completed grade 12 (32)*
    _____*Diploma (21)*
    _____*University degree (17)*
    _____ *Don't Know (0)*

17. What is your religious affiliation?
    _____*Christian (154)*
    _____*Hindu (1)*
    _____*Muslim (0)*
    _____*Traditional African (15)*
    _____*None (8)*
    _____ *Other (specify)_____ (2)*

18. Religion is important in my daily life.
    _____*Strongly Agree (111)*
    _____ *Agree (59)*
    _____*Don't Know (4)*
    _____*Disagree (2)*
    _____ *Strongly Disagree (4)*

19. Theft is a major problem in South Africa.
    _____*Strongly Agree (96)*
    _____ *Agree (67)*
    _____*Don't Know (4)*
    _____*Disagree (10)*
    _____ *Strongly Disagree (3)*

20. Have you or your family been victim of theft?

_____ *Yes (88)*
_____ *No (83)*
_____ *Don't Know (0)*

21. Is livestock theft common where your family lives?

_____ *Yes (95)*
_____ *No (66)*
_____ *Don't Know (0)*

22. Have you ever considered taking someone else's property or livestock?

_____ *Yes (15)*
_____ *No (161)*
_____ *Don't Know (0)*

23. Does your family live in a rural area?

_____ *Yes (115)*
_____ *No (65)*
_____ *Don't Know (0)*

24. Does your family own farmland?

_____ *Yes (please answer parts a and b below)(12)*
_____ *No (please skip to question 25) (157)*
_____ *Don't Know (please skip to question 25) (0)*

If yes above-
   a. Approximately how many hectares does your family own? _____
      (mean = 10,270[65])

   b. This land is used to produce: (check all that apply)
      _____ *Maize (11)*
      _____ *Sunflower (1)*
      _____ *Wheat (0)*
      _____ *Other (specify)_____ (5)*

---

[65] One respondent indicated substantial landholdings. Only three respondents indicated landholdings in excess of 100 hectares.

25. Does your family own livestock?

          ____Yes (please answer parts a and b below) (42)
          ____No (please skip to question 26) (102)
          ____Don't Know (please skip to question 26) (0)

If yes above-

a. Approximately how many of each livestock type does your family own?
       Cattle_____(mean = 16)
       Sheep_____(mean = 11)
       Goats_____(mean = 17)
       Hogs_____(mean = 5)
       Horses_____(mean = 2)

b. Has your family been a victim of livestock theft?
       ____Yes (16)
       ____No (23)
       ____Don't Know (0)

26. Are you a university student?

      _____*Yes (please answer parts a through d below) (180)*

      _____*No (please skip to the next page) (0)*

      _____*Don't Know (please skip to the next page) (0)*

If yes above-

    a. How many years, including this one, have you studied in a university?

        _____*1 (48)*

        _____*2 (50)*

        _____*3 (25)*

        _____*4 (43)*

        _____*5 (12)*

        _____*More than 5 (1)*

    b. How many economics or agricultural economics courses have you taken?

        _____*0 (69)*

        _____*1 (55)*

        _____*2 (28)*

        _____*3 (14)*

        _____*4 (7)*

        _____*5 (3)*

        _____*More than 5 (1)*

    c. Is your field of study either economics or agricultural economics?

        _____*Yes (49)*

        _____*No (117)*

        _____*Don't Know (0)*

    d. Do you work while attending university?

        _____*Yes (13)*

        _____*No (166)*

27. It is easy for me to communicate in English.
    _____ *Strongly Agree (75)*
    _____ *Agree (101)*
    _____ *Don't Know (2)*
    _____ *Disagree (1)*
    _____ *Strongly Disagree (0)*

28. It is easy for me to communicate in Sotho.
    _____ *Strongly Agree (92)*
    _____ *Agree (31)*
    _____ *Don't Know (5)*
    _____ *Disagree (40)*
    _____ *Strongly Disagree (11)*

29. I understood the instructions for this study.
    _____ *Strongly Agree (80)*
    _____ *Agree (95)*
    _____ *Don't Know (2)*
    _____ *Disagree (2)*
    _____ *Strongly Disagree (0)*

30. I am confident that only researchers will see my responses to these questions.
    _____ *Strongly Agree (92)*
    _____ *Agree (68)*
    _____ *Don't Know (15)*
    _____ *Disagree (3)*
    _____ *Strongly Disagree (1)*

31. I am confident that I will be paid according to the instructions for this study.
    _____ *Strongly Agree (102)*
    _____ *Agree (58)*
    _____ *Don't Know (18)*
    _____ *Disagree (1)*
    _____ *Strongly Disagree (0)*

32. I am confident that my decisions will impact another student's earnings in this study.
    _____ *Strongly Agree (79)*
    _____ *Agree (68)*
    _____ *Don't Know (25)*
    _____ *Disagree (5)*
    _____ *Strongly Disagree (1)*

33. If you have any other information you would like to share with researchers, please do so in the space below.

APPENDIX C

Consent Form
Decision Making Study

You are being asked to be a volunteer in a research study on decision making. You were selected as a possible participant because you are associated with the University of the Free State. We ask that you read this form and ask any questions you may have before agreeing to be in the study. You must be at least 18 years of age to participate in this study.

Background Information
Clint Pecenka, a graduate student in the Department of Applied Economics at the University of Minnesota is conducting this study as part of his doctoral dissertation. This project is part of ongoing collaboration between the Department of Applied Economics at the University of Minnesota and the Department of Agricultural Economics at the University of the Free State.

The purpose of this study is to further our understanding of how people make resource allocation decisions.

Procedures
If you agree to participate in this study you will be asked to make one or more decisions in an economic study. After the decision making part of the study you will be asked to respond to survey questions about yourself, your background and your experiences.

The decision making and survey part of the study should last approximately 40 minutes. At the end of the study, you will be told when and where you can collect your earnings from this study. You will collect your earnings at a location on your campus. You will be assigned an identification number which you will use to collect your earnings. Because this study is taking place on multiple university campuses and at different times, your earnings will not be immediately available.

Risks and Benefits of the Study
There are no known risks associated with your participation in this project beyond those of everyday life. Although you will receive no direct benefits, this project may help the researcher to better understand the decision making process of individuals in many common situations.

Compensation
You will be offered 20 Rand for your participation. You may be able to earn additional money by participating, but this will depend on the decisions made during the study.

Voluntary Nature of the Study
Participation in this study is voluntary. You may refuse to participate or withdraw at any time. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota or with the University of the Free State. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships. However if you withdraw before the end of the study or do not answer all questions, you may not receive payment.

Confidentiality
The records of this study will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only researchers will have access to the records.

Contacts and Questions
The researcher conducting this study is Clint Pecenka. You may ask any questions you have now. If you have any later questions, **you are encouraged** to contact him at pece0001@umn.edu or 09-1-612-201/1813. He can be reached by mail at 218K Classroom Office Building, 1994 Buford Avenue, St. Paul, MN 55108, USA. You may also contact his doctoral advisor, Professor Terry Hurley, at tmh@umn.edu or 09-1-612-625/1238. Professor Hurley can be reached by mail at 231j Classroom Office Building, 1994 Buford Avenue St Paul, MN 55108, USA.

If you have questions, you may also contact Dr. Godfrey Kundhlande in the Department of Agricultural Economics at the University of the Free State. You may contact Dr. Kundhlande at kundhlg@ufs.ac.za or 051-401 9053. He may also be reached at the Department of Agricultural Economics, PO Box 339, University of the Free State, Bloemfontein, 9300.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), **you are encouraged** to contact the Research Subjects' Advocate Line at 09-1-612-625/1650. The Research Subjects' Advocate Line can be reached by mail at D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455, USA.

You will be given a copy of this information to keep for your records.

Statement of Consent

I have read the above information. I have asked questions and have received answers. I consent to participate in the study.

Signature: _____   Date:

Signature of Investigator: _____   Date:

Consent Form-Participant Copy
Decision Making Study

You are being asked to be a volunteer in a research study on decision making. You were selected as a possible participant because you are associated with the University of the Free State. We ask that you read this form and ask any questions you may have before agreeing to be in the study. You must be at least 18 years of age to participate in this study.

Background Information
Clint Pecenka, a graduate student in the Department of Applied Economics at the University of Minnesota is conducting this study as part of his doctoral dissertation. This project is part of ongoing collaboration between the Department of Applied Economics at the University of Minnesota and the Department of Agricultural Economics at the University of the Free State.

The purpose of this study is to further our understanding of how people make resource allocation decisions.

Procedures
If you agree to participate in this study you will be asked to make one or more decisions in an economic study. After the decision making part of the study you will be asked to respond to survey questions about yourself, your background and your experiences.

The decision making and survey part of the study should last approximately 40 minutes. At the end of the study, you will be told when and where you can collect your earnings from this study. You will collect your earnings at a location on your campus. You will be assigned an identification number which you will use to collect your earnings. Because this study is taking place on multiple university campuses and at different times, your earnings will not be immediately available.

Risks and Benefits of the Study
There are no known risks associated with your participation in this project beyond those of everyday life. Although you will receive no direct benefits, this project may help the researcher to better understand the decision making process of individuals in many common situations.

Compensation
You will be offered at least 20 Rand for your participation. You may be able to earn additional money by participating, but this will depend on the decisions made during the study.

Voluntary Nature of the Study
Participation in this study is voluntary. You may refuse to participate or withdraw at any time. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota or with the University of the Free State. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships. However if you withdraw before the end of the study or do not answer all questions, you may not receive payment.

Confidentiality

The records of this study will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only researchers will have access to the records.

Contacts and Questions

The researcher conducting this study is Clint Pecenka. You may ask any questions you have now. If you have any later questions, **you are encouraged** to contact him at pece0001@umn.edu or 09-1-612-201/1813. He can be reached by mail at 218K Classroom Office Building, 1994 Buford Avenue, St. Paul, MN 55108, USA. You may also contact his doctoral advisor, Professor Terry Hurley, at tmh@umn.edu or 09-1-612-625/1238. Professor Hurley can be reached by mail at 231j Classroom Office Building, 1994 Buford Avenue St Paul, MN 55108, USA.

If you have questions, you may also contact Dr. Godfrey Kundhlande in the Department of Agricultural Economics at the University of the Free State. You may contact Dr. Kundhlande at kundhlg@ufs.ac.za or 051-401 9053. He may also be reached at the Department of Agricultural Economics, PO Box 339, University of the Free State, Bloemfontein, 9300.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), **you are encouraged** to contact the Research Subjects' Advocate Line at 09-1-612-625/1650. The Research Subjects' Advocate Line can be reached by mail at D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455, USA.

You will be given a copy of this information to keep for your records.

Statement of Consent

I have read the above information. I have asked questions and have received answers. I consent to participate in the study.

Signature: _____   Date:

Signature of Investigator: _____   Date:

Instructions

Thank you for participating in this decision making study. You will be asked to make resource allocation decisions that will help researchers understand the decision making process of individuals in many common situations. There are no correct or incorrect answers to the decisions you will make.

In this envelope you will find:
  -this instruction sheet
  -a survey
  -a payment collection information sheet

For your participation in this study, you will earn a participation payment of 20 Rand. You will also have the opportunity to earn additional money. Your final earnings will be determined by the decisions you and others make during the study. Earnings will be paid to you after the study has ended for all participants. You will not be paid today. You will be able to collect your earnings Monday, August 23. The payment collection information sheet tells you when and where you can collect your earnings. Identification numbers are used so that your decisions and payment are not known to others.

Today, you will complete a decision making part of the survey and then a demographic part of the survey. The two parts of the survey may take approximately 30 minutes to complete. After you complete the survey, please return your materials to your envelope.

Keep the payment collection information sheet and take it with you. **If you do not bring the payment collection information sheet to collect payment, you may not be paid.** Once you have returned your other materials to the envelope, you may return the envelope to researchers and then leave the study room.

Please do not talk to other participants during the study. Once you answer a question, do not return to that question.

During this study, you will make several decisions. For each decision you will be randomly paired with a different student at another South African university campus. Although this student will change after each decision, these students will always be referred to as student A. Some decisions you make will impact your payment and the payment of student A. Some decisions will not. A computer will randomly determine which decisions will impact payments. The decisions that will impact payments will be determined after the study. Make each decision as if it will impact final payments. **Decisions will impact both your final payment and the payment of a student A with whom you are paired. The decisions you will make involve real money.**

Please raise your hand to ask any questions now. Once you begin the survey, please do not ask questions out loud. Please raise your hand and a researcher will assist you.

Payment Collection Information

Dear Student,

Thank you for participating in this decision making study. If you would like to contact researchers at any time, you are encouraged to do so. Contact information is provided below.

You will be able to collect your earnings at **Room 1033, Administration Building on Monday, August 23 between 8 am and 11 am or between 1 pm and 3 pm.**

You must bring this form to collect your earnings. If you lose this form, you may not be able to claim your earnings.

Your Identification Number is: **H123BS-5744**

If you are unable to collect your earnings during the times listed above, email pece0001@umn.edu to make alternative arrangements.

Thank you for your participation.

Contacts and Questions
The researcher conducting this study is Clint Pecenka. You may ask any questions you have now. If you have any later questions, **you are encouraged** to contact him at pece0001@umn.edu or 09-1-612-201/1813. He can be reached by mail at 218K Classroom Office Building, 1994 Buford Avenue, St. Paul, MN 55108, USA. You may also contact his doctoral advisor, Professor Terry Hurley, at tmh@umn.edu or 09-1-612-625/1238. Professor Hurley can be reached by mail at 231j Classroom Office Building, 1994 Buford Avenue St Paul, MN 55108, USA.

If you have questions, you may also contact Dr. Godfrey Kundhlande in the Department of Agricultural Economics at the University of the Free State. You may contact Dr. Kundhlande at kundhlg@ufs.ac.za or 051-401 9053. He may also be reached at the Department of Agricultural Economics, PO Box 339, University of the Free State, Bloemfontein, 9300.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), **you are encouraged** to contact the Research Subjects' Advocate Line at 09-1-612-625/1650. The Research Subjects' Advocate Line can be reached by mail at D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455, USA.