POVERTY ALLEVIATION AND PUBLIC POLICY:
THREE ESSAYS ON IMPACT OF CASH TRANSFERS ON
FOOD INSECURITY, LIFE SATISFACTION AND INFORMAL TRANSFERS

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A dissertation submitted to the faculty at the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Public Policy.

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ABSTRACT

Garima Bhalla: Poverty Alleviation and Public Policy: Three Essays on Impact of Cash
Transfers on Food Insecurity, Life Satisfaction and Informal Transfers
(Under the direction of Sudhanshu Handa)

This dissertation investigates non-obvious ways in which social programs can affect households

such as resilience, psychosocial wellbeing and social capital. I use quasi-randomized longitudinal

data collected for the evaluation of Zimbabwe's Harmonized Social Cash Transfer (HSCT)

Program. The HSCT is an unconditional cash transfer program targeted to ultra-poor households

who are food poor and labor constrained. Data was collected through a detailed household

survey, conducted at baseline and 12-month follow-up. The first paper shows that aggregate food

consumption hides dynamic activity taking place within the household. In addition, I find that

several dimensions of household vulnerability correlate more strongly with an experiential food

security measurer, than with aggregate food consumption. My second paper finds that the impact

of the cash transfer on subjective wellbeing is partially mediated through food security, but

social participation measures indicate null to negligible mediation. Qualitative data reveal that

while the cash transfer enables beneficiaries to be active participants in their communities, it also

leads to tension between beneficiaries and non-beneficiaries. In the third paper, I investigate if

the HSCT crowded-out inter-household transfers, that are gifts in cash or kind, provided to a

household through informal sources, such as neighbors, friends, extended family, etc. I find that

the program does not crowd-out informal inter-household transfers. Other mechanisms by which

poor households manage risk and cope with liquidity constraints include contributions made to

social networks or the ability to take out a loan. I do not find any impact of the Program on loans

and amount outstanding of the beneficiary. However, number of households making

contributions and the value of these contributions has increased, especially so for female-

respondent households.

ACKNOWLEDGEMENTS

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CHAPTER 1: INTRODUCTION

1.1 Research Objective

Cash transfers are increasingly being utilized as a preferred strategy for poverty

alleviation. They refer to programs that provide direct cash to a targeted population group that

fulfills specific eligibility criteria for receiving these transfers from the government. As such, this

concept is as old as the welfare state: non-contributory pension schemes, disability benefits, child

allowance and income support, student grants and scholarships, and assured work programs are

all examples of direct cash transfers. However, reliance on cash transfers as the main vehicle of

national social protection programs with poverty reduction as their main objective is relatively

recent. These were first popularized in Latin America in the 1990s and have since then been

embraced by several developing countries in Asia and Africa. Currently more than a hundred

countries implement conditional or unconditional cash transfer programs (FAO, 2015). The

theoretical basis for these programs is that regularity and predictability of cash payments allow

poor households to smooth income and consumption across the year.

Cash transfer programs operate across all four categories of the asset-based social

protection framework provided by Adato and Bassett (2008):

- *Protection* - secure basic consumption needs
- *Preventative* – reduce impacts of shocks that cause fluctuations in consumption

   through reduction in risk and income variation and avoid distress sale of productive

   assets

- ***Promotional*** – help people to build their human, financial, and physical capital by enabling them to take-up educational and health services, access credit on better terms, and buy productive assets,

- ***Transformational*** - build assets and make institutional changes that strengthen economic, political, and social relationships

Theory, therefore, tells us that social protection programs can have wide ranging effects on the entire household economy. Fiszbein and Schady (World Bank, 2009), Handa and Davis (2006), and Adato and Basset (2008) provide excellent overviews of the impact of different cash transfer programs on poverty, food consumption, schooling, health, asset accumulation, economic productivity, and HIV prevention. Considerably less research however, has been conducted on impact of social cash transfers on experienced wellbeing of beneficiaries, the interplay between objective and subjective measures of wellbeing, and on understanding the underlying mechanisms that lie behind the impacts that we observe. My dissertation investigates non-obvious ways in which social programs can affect households such as resilience, psychosocial wellbeing and social capital. There is scarce research on these nuanced, and potentially very important, but often ignored areas of wellbeing.

1.2. Overview

For my dissertation, I use data collected for the evaluation of the Harmonized Social Cash Transfer program (HSCT) Program in Zimbabwe. The HSCT is an unconditional cash transfer program targeted to ultra-poor households who are food poor and labor constrained. It is the country's primary social safety net program. Data is collected through a detailed household

survey, conducted at baseline and 12-month follow-up. The household survey instrument is comprehensive covering demographic, social, economic, and psychological information, both at the household and individual level. The study design is such that it allows me to use a difference-in-difference model to compare changes over time for the treatment and a matched comparison group.

Paper 1: The Effect of Cash Transfers and Household Vulnerability on Food security in Zimbabwe

In this paper, I investigate determinants of food security as measured by a well-known food security scale – the Household Food Insecurity Access Scale (HFIAS) – and as measured by value of household food consumption composed of own-production, market purchases and gifts received. I find that several dimensions of household vulnerability correlate more strongly with the food security measure than with food consumption. Labour constraints, which is a key vulnerability criterion used by the HSCT to target households, is an important predictor of the food security score but not food consumption, and its effect on food security is even larger during the lean season. Difference-in-differences impact analysis shows that the HSCT programme has had statistically significant impacts on Food Security and Diet Diversity scores but null to low impacts on food consumption. However aggregate food consumption hides dynamic activity taking place within the household where the cash is used to obtain more food from the market and rely less on food received as gifts. The cash in turn gives beneficiaries greater choice in their food basket, which improves diet diversity.

Paper 2: Mediation Analysis of the Impact of an Unconditional Cash Transfer on Subjective Wellbeing

This paper analyzes if an increase in income due to the cash transfer program increases the beneficiaries' judgment of their overall life satisfaction (Direct Impact). To measure subjective wellbeing I use the five-item Satisfaction with Life Scale that captures beneficiaries' judgments of their overall life satisfaction. I find that the total impact of the cash transfer on Satisfaction with Life score is in the range of 14 to 17 percent. I next analyze if the impact of the cash transfer on overall life satisfaction is mediated through how people spend that income, i.e. through satisfaction of basic needs as indicated by decreased food insecurity and/or through satisfaction of higher-order needs as indicated by increase in social participation. I find that about 16 to 26 percent of the total impact is mediated through a reduction in food insecurity. Measures used to track social participation revealed only null to negligible mediation impact. Interviews with beneficiaries and key informants and focused group discussions reveal that the impact of the cash transfer on social participation is complex. While it can enable beneficiaries to be active participants in their communities, it can also lead to tension between beneficiaries and non-beneficiaries.

Paper 3: Do Government Cash Transfers crowd out Informal Inter-Household Transfers?

Cash transfers enable households to overcome liquidity constraints and reduce income variability. Informal transfers, that are gifts in cash and/or kind, friends, provided to a household through informal sources, such as neighbors, friends, and extended family, also perform the same function. Do cash transfers provided by the government crowd–out private informal transfers? If so, the worry is that a government program might be weakening social networks that play an

implicit role in sharing idiosyncratic risk. Empirical literature indicates that crowding-out can occur on the extensive margin, i.e. the probability of receiving a transfer, and on the intensive margin, i.e. amount of transfer conditional on it being positive. I therefore estimate - 1) the probability a household will receive informal transfers and 2) determinants of the monetary value of informal transfers. Utilizing a difference-in-differences methodology, I find that the program does not crowd-out informal inter-household transfers. Other mechanisms by which poor households manage risk and cope with liquidity constraints include contributions made to social networks or the ability to take out a loan. I do not find any impact of the Program on loans and amount outstanding of the beneficiary. However, number of households making contributions and the value of these contributions has increased, especially so for female-respondent households. This suggests a type of 'social re-engagement' and an increased ability to participate in community life and 're-enter' social networks. This is an important component of the program's overall impact that is not always picked up in the evaluation of poverty programs.

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CHAPTER 2: THE EFFECT OF CASH TRANSFERS AND HOUSEHOLD VULNERABILITY ON FOOD SECURITY IN ZIMBABWE

2.1.Introduction

The United Nations, as part of its post-2015 Sustainable Development Agenda, has declared ending hunger and achieving food security as the second of its 17-goal agenda, to be achieved by 2030. At present, about 795 million people are still undernourished globally, and the prevalence rate in sub-Saharan Africa is 23 per cent. In Zimbabwe, the proportion of undernourished in the total population is even higher at 33 per cent (FAO, IFAD & WFP, 2015). In the past year, food security has worsened due to a poor 2015 harvest season and El Niño-induced below normal rains in early 2016. The Government declared a state of national disaster in February 2016 and appealed for USD 1.5 billion aid for food and other emergency needs. Dry and high-heat conditions have resulted in a significant reduction in cropped area and increased crop failure, particularly in the drought-affected southern districts (FEWS NET, March, 2016). Addressing the challenge of growing food insecurity requires implementation and scale up of effective social protection programmes.

In 2012 Zimbabwe launched the Harmonized Social Cash Transfer Programme (HSCT), an unconditional cash transfer targeted to ultra-poor, labor-constrained households. Eligible households were identified according to HSCT operational guidelines through a detailed targeting census conducted by the national statistical agency. The programme initially reached 55,000 households though with the recent fiscal crisis in the country these numbers may soon go

down. We utilize longitudinal data from a large impact evaluation conducted as part of the second scale-up wave of the programme. Data was collected on 3063 households across 60 clusters in six districts. Households in 60 Wards were slotted to enter the programme immediately and serve as the treatment group for the evaluation, while households in the 30 Wards resided in areas that were to enter the programme in a later phase and thus serve as the comparison group.

To better understand food security we utilize baseline data to compare determinants of food security as measured by the Household Food Insecurity Access Scale (HFIAS) and the value of per capita food consumption within the household. The analysis indicates that factors, which directly reflect household vulnerability, such as exposure to shocks, labour constraints, and income from casual labour, are significant in explaining variation in the Food Security score but not food consumption. This provides evidence that a consumption-based measure may not fully capture household vulnerability. We extend the vulnerability analysis by stratifying our sample of baseline households into those that were interviewed just prior to the harvest season (and so presumably would be more food insecure) and those interviewed during the harvest season (and so would be less food insecure). We find that the negative impact of being labour constrained is accentuated during the lean phase, but only for the Food Security measure, suggesting that the difference between the two measures is even more apparent when risk is high. This finding underlines the important practice of utilizing labour-constrained status as an attribute for identifying programme beneficiaries, as is done in the HSCT and other national cash transfer programmes throughout sub-Saharan Africa.

Utilizing a difference-in-differences methodology, we find that after 12 months of implementation, the Zimbabwe HSCT Programme has had a null to low impact on value of food consumption but statistically significant positive impacts on Food Security and Diet Diversity scores. A detailed analysis that disaggregates food consumption into consumption sourced from own-production, market purchases and gifts received, reveals that access to cash allowed households to purchase more food from the market, diversify its own-production of certain foodstuffs, and rely less on gifts as a source of food. Disaggregation of food consumption into different food groups also reveals that the cash allows households greater choice in their food basket. These changes are captured by the Food Security score and the Diet Diversity score but not in the value of aggregate food consumption.

This paper makes contributions to two distinct but inter-related literatures. First, we provide evidence on the relative merits of using a comprehensive consumption expenditure measure versus a food security scale to assess household vulnerability and food insecurity. While consumption is the preferred measure for economists, those working specifically in food security maintain that consumption alone does not pick up the multiple and nuanced dimensions of food security that go beyond access. Second, we contribute to a small but growing literature on the effects of state-sponsored *unconditional* cash transfers in Africa on household behavior and wellbeing. Existing evidence on cash transfers is dominated by studies from Latin America on *conditional* cash transfers, and many of those are from one single program (Progresa/Oportunidades). The generalizability of that evidence to different contexts and without conditions is not straightforward.

2.2. Literature Review

Food security is defined as the situation "when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 2009). A common framework utilized by scholars to highlight the different dimensions of food security is a four-tier categorization – availability of food; access to food, which refers to the ability of households to obtain food from the market or own production or gifts; utilization of food; and stability, which is the ability of households to withstand risks and shocks that erode any of the other three dimensions (Webb et al., 2006).

During the 1980s, due in large part to the work of Sen (1981), there was a shift of emphasis from food-availability indicators to food-access indicators. Sen's argument was that it is not enough if the country or region has adequate food supplies to feed its population, but the population also needs to have the ability to access this food. Another shift in focus has been in moving from objective to experiential measures. This change has been driven by the recognition of the experiential aspect of the process that leads to the condition of being hungry. Some households can be food insecure, and yet not immediately experiencing hunger. The rationale for utilizing experiential-based indicators is that it "puts people's experiences and behavioral responses at the core of the definition of what food security means" (Ballard et al., 2013, p.23), rather than focusing on determinants of food security (income/expenditure) or its outcomes (nutrition). Table 2.1 lists some of the most common currently used food security measures. Access-to-food measures are highlighted, as these are the main focus of this paper.

Table 2.1. Measures Corresponding to each pillar of Food security

Pillar of food in/security	Barriers/ determinants	Indicator/s	Level	Type of indicator
Availability	Agricultural and economic (e.g. market prices)	Proportion of undernourished (derived from total food stock, population, and income distribution data)	State	Objective
Access	Above factors + socioeconomic (ownership of assets like land and livestock, social networks)	• Food consumption (kcal) • Food expenditure [a] (S) • HFIAS • Diet Diversity [b]	Household (can also be collected at individual level)	Objective and subjective/experiential
Utilization	Above factors + behavioral (health and child care practices), intra-household dynamics	Anthropometrics	Household (can also be collected at individual level)	Objective
Stability	Economic (local, state, and international), social, agro-climactic, behavioral	Resilience Index [c]		Objective and subjective

[a] Value of all food expenditure including value of gifts and own production consumed, divided by family size

[b] Value of expenditure (including gifts and own production consumed) on eight different food groups: cereal, roots and tubers, meat/poultry/fish, fruits and vegetables, pulses, dairy, sugar/fats, and food eaten out

[c] The Resilience Index indicator has only recently been conceptualized. It is yet to be operationalized and therefore currently there are no indicators to satisfactorily measure the fourth pillar. This is because it is difficult to capture the dynamic aspect of food insecurity. Conceptually,

R = f(IFA = income and food access; ABS = access to basic services; AA = agricultural assets; NAA = non-agricultural assets; APT = agricultural practice and technology; SSN = social safety nets; CC = climate change; EIE = enabling institutional environment; S = sensitivity; AC = adaptive capacity)

Cash transfers are a policy instrument that can help build household resiliency in

obtaining access to food. In their Resilience Index Measurement and Analysis (RIMA) model,

Alinovi, Mane and Romano (2009) include income and food access as one of the six different

dimensions that determines resiliency. Alleviating poverty and increasing food consumption are

primary objectives of cash transfer programmes. The theoretical basis for these programmes is that regularity and predictability of cash payments allow poor households to smooth consumption across the year and build human and physical capital that will allow them to absorb shocks (Arnold et al., 2011; FAO, IFAD & WFP 2015). Their impacts on food consumption and nutrition have been well documented (Adato and Bassett, 2008; Kenya CT-OVC Evaluation Team 2012). According to a comprehensive review by the Department for International Development of the United Kingdom (Arnold et al., 2011), about half the value of the cash transfer is spent on food. However, impacts vary depending on the duration over which the transfer is received, age of the recipient, and size of the transfer. In Malawi, Miller et al. (2011) demonstrate large effect sizes that are statistically significant on food expenditure, consumption, and diet diversity. They also find upwards of a 32 percentage point (pp) difference in the following four questions that capture food adequacy: do households consume less than enough; are they still hungry after meals; do they experience more than eight days per month without adequate food; are at least two meals consumed daily. These large effect sizes are explained in part by the size of the cash transfer, which ranged from $4.29 to $22 per month, and on average accounted for sixty percent of per capita total household expenditure.

In this paper we use a longitudinal ward-level matched case-control design to analyze the impact of a cash transfer programme implemented in rural Zimbabwe on household food security after 12 months of implementation. Within access-to-food measures we focus on value of household food consumption, household diet diversity, and a household food security score as measured by the Household Food Insecurity Access Scale (HFIAS). The HFIAS was developed by the Food and Nutritional Technical Assistance (FANTA) project of USAID. It is a 9-item

scale, with a reference period of the past four weeks where households are asked to rate their experience on a scale from 'Rarely' to 'Often', generating a total score from 0 to 27. It thus "provides a continuous measure of the degree of food insecurity of the household" (Coates, Swindale & Bilinsky, 2007, p.18). A higher score indicates the household suffers from more food insecurity and is relatively worse off. It captures the experiential aspect of food insecurity by including anxiety about future availability of food; consumption of food items that are not preferred; and limiting diet diversity as part of its construct. These three domains were identified based on the ethnographic work done by Radimer, Olson & Campbell (1990) in the United States. Coates et al. (2006) confirmed these domains to be common across diverse cultural settings.

The HFIAS then, goes beyond a food expenditure measure by capturing not just present food consumption status but also the uncertainty and vulnerability associated with maintaining or improving that status[1]. Vulnerability has been defined in different ways but the basic idea is that it is forward looking and captures the risk or "likelihood that at a given time in the future, an individual will have a level of welfare below some norm or benchmark" (Hoddinott and Quisumbing, 2003, p. 9). It is a forward-looking concept as opposed to a snapshot in time presented by food consumption expenditure. This distinction has been well documented in the literature on poverty (Dercon, 2001; Chaudhuri et al. 2002; Hoddinott and Quisumbing, 2003). In the food insecurity literature, the direction this research has taken has been generally that of validation studies. Jones et al. (2013) provide a review of four key validation studies of HFIAS in Iran (urban Tehran), Tanzania (poor rural households), Burkina Faso (urban households), and

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[1] Aside from construct validity, an additional reason why practitioners might choose to utilize the HFIAS in the field is its relative ease of deployment since it is less time intensive to complete than a complete food consumption module. As a result, it is also less expensive to deploy.

Ethiopia (community health volunteers). They find evidence of the construct validity of the HFIAS and high internal consistency. They also find that the HFIAS score is negatively associated with other proximate determinants for food security such as household wealth/assets, maternal education, husband's education, household per capita income and expenditure, and diet diversity. In Zimbabwe, Nyikahadzoi et al. (2013) found the HFIAS score to be higher in elderly headed households and within these households, food insecurity is negatively associated with social capital, remittances, and off-farm income. In another study among smallholder farmers in the Mudzi district of Zimbabwe, Mango et al. (2014) found that the HFIAS score is predicted by household labour, education of the household head, household size, remittances, livestock ownership and access to market information.

Migotto et al. (2005) compare a Consumption Adequacy Question (CAQ) with household caloric consumption, expenditure, diet diversity, and anthropometry in Albania, Indonesia, Madagascar and Nepal. They find that the CAQ is only weakly correlated with these indicators and that there is poor overlap among them in that they do not categorize the same households as food insecure. They assess if the CAQ is too subjective to make comparisons across households, perhaps because it captures *relative* food insecurity (relative to food status in the past and relative to others in the community). They find that perception of food adequacy is highly correlated with subjective perceptions of future and past wealth, and thus may be capturing 'vulnerability', which the other quantitative indicators do not capture. However, they caveat their findings because statistical significance of subjective answers could simply be capturing 'attitudinal characteristics'. A longitudinal study that is able to control for responder bias would help in answering this question. Frongillo and Nanama (2006) use longitudinal data on 126

households in nine villages in Burkina Faso across five time periods from 2001-2003. They calculate a household food insecurity score from an HFIAS-like scale and find it to be negatively and significantly correlated with economic status (total assets and net income per adult equivalent) and dietary intake indicators (such as food share expenditure) but not significantly correlated with anthropometric indicators. In another longitudinal study, Loopstra & Tarasuk (2013) find that changes in income and employment over the span of one year among 331 low-income families living on market-rent in Toronto are significantly associated with changes in severity of food insecurity.

2.3. Research Setting and Design

2.3.1. The Zimbabwe Harmonized Cash Transfer Program

We use data collected for the evaluation of the Harmonized Social Cash Transfer (HSCT) Programme, an unconditional cash transfer program, introduced in 2011 by the Government of Zimbabwe. Program implementation is being done in a phased manner and it is anticipated that eventually the Program will cover the entire country. In January 2016, the Program covered 52,500 households, and approximately 300,000 households are expected to be eligible for the program at full-scale.

Benefits are structured such that the size of the transfer varies with household size: a one-person household receives USD10, two-person receives USD15, three-person receives USD20, and a household made up of four or more persons receives USD25. The program thus provides between $10 and $25 per month, which represents about 20 percent of total household consumption expenditure.

The program is targeted at households that are *food-poor and labor constrained*. Eligible households are identified through a detailed targeting census that is conducted by ZIMSTAT, the national statistical agency. All households are screened using the targeting survey fielded by ZIMSTAT, and data is then processed to compute a proxy poverty score that serves as the first eligibility criterion. A household is considered food-poor when it is living below the food poverty line[2] and is unable to meet the most basic needs of its members. A list of ten indicators that measure the ability of the household to meet basic needs is used to determine eligibility on this criterion.[3] At least three of these have to be met for the household to be eligible for the Program.

The Program has a clearly defined approach for categorizing a household as labor constrained, which is the second eligibility criterion. Throughout the paper, we use this definition to operationalize the attribute of being labor constrained. A household is considered labor constrained when:

1. There is no able bodied household member between 18-59 years who is fit for productive work, OR

2. The dependency ratio is three or more, i.e., one fit to work household member between 18-59 years has to take care of three or more dependents. Dependents are

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[2] Food poverty line is the threshold where total household expenditure is below what is required to meet the food energy requirement for each household member, set at 2,100 kcal/day/person.

[3] The 10 indicators as given in Form1R, which is used for assessing eligibility are: only one or no meals per day; grains lasted for less than three months last harvest season; no/minimal livestock; no blankets; no rooms/huts for sleeping; rudimentary house material; live on begging or some piece work; get no/minimal regular support from relatives or others; have no valuable assets, e.g. animal drawn cart, vehicle; and the household is landless or owns less than one acre.

those household members who cannot or should not work because they are under 18 years of age or they are elderly (over 59 years of age) or they are unfit for work because they are chronically ill or disabled or still in school, OR

3. The dependency ratio is between two and three and the household has a severely disabled or chronically sick household member who requires intensive care.

2.3.2. Study Design

The phased roll out of the HSCT allows us to use households in regions slotted to enter the program at a later date to form a comparison group. Within districts the program operates at an administrative unit known as the Ward. Child Protection Committees (CPCs) are formed within each Ward who are responsible for ensuring that targeting of households is conducted thoroughly and who are in charge of communication of program rules and operational activities (such as payment dates) between the district social welfare office and beneficiary households. The geographic area of a Ward varies by population density as each Ward comprises a cluster of anywhere from 10-20 villages. The Ward comprises the primary sampling unit for the sample design.

Phase 1 of the HSCT expansion occurred in 2011-12 and covered ten districts. Wards for the treatment group of the evaluation were selected from Phase 2 areas, which entered the program in 2013. Wards for the control group were selected from areas that were slotted for Phase Four expansion and that were geographically close to Phase 2 areas. A detailed analysis of all Wards in these areas (Phase 2 areas and Phase 4 areas geographically close to Phase 2 areas) was then conducted by the study team led by the national research partner Ruzivo Trust based in

Harare. Each Ward was assigned a point score based on five characteristics: forest cover, nearness to main roads, resistance to shocks, nearness to business centers, and water sources. On each criterion a Ward was scored from 1 (low) to 3 (high) and the maximum score possible was thus 15.[4] Power calculations based on the expected number of households per Ward indicated that a total of 60 Treatment and 30 Comparison Wards were necessary for the study.[5] The 60 treatment Wards were stratified across the three treatment districts (Mudzi, Mwenezi and Binga), and the 30 comparison Wards were likewise stratified to areas adjacent to the three treatment districts.

Wards in treatment areas were ranked from highest point score (most vulnerable) to lowest and paired with each stratum. Then, for each treatment Ward pair with a given score, a comparison Ward with the same score in the same stratum was selected to serve as the 'matched' comparison Ward. In cases where more than one comparison Ward existed with the same score, one was picked randomly. In cases where no comparison Ward existed with the exact same score, the Ward with the closest point score was selected. Figure 2.1 provides a map showing the geographic location within Zimbabwe of the study sites.

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[4] Details of the Ward level analysis are available upon request.

[5] Sample size calculations were based on the power to detect a meaningful change in the height-for-age z-score of children under age 60 months, the indicator for which the largest effective sample size was required (Handa et *al.*, 2013).

Figure 2.1. Map of Zimbabwe
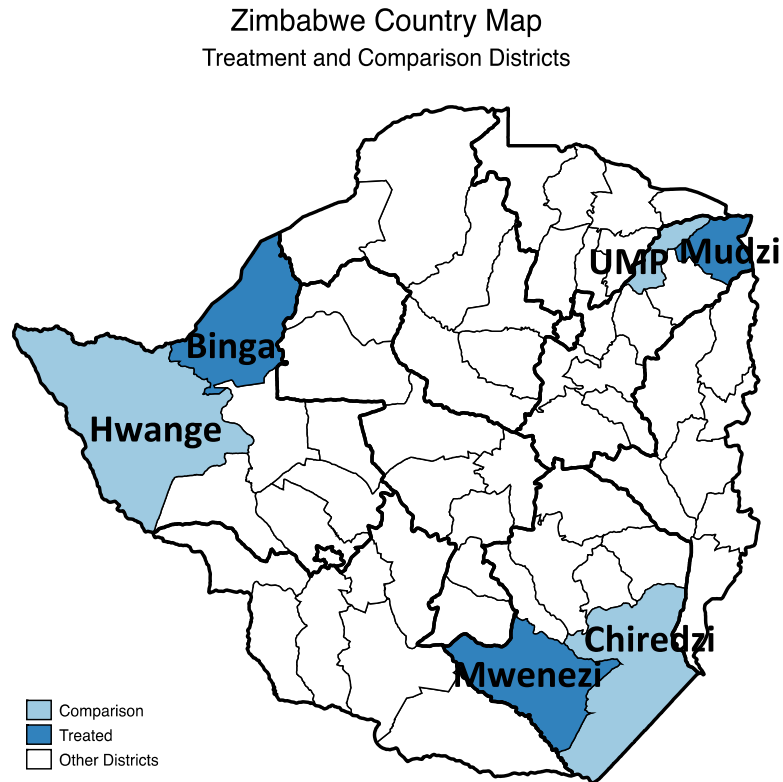
Zimbabwe Country Map
Treatment and Comparison Districts

Source: Constructed using Stata 13.1. The darker outlines in the map are province boundaries.
Shape files obtained from http://www.gadm.org/

In the selected study Wards (both treatment and comparison), program targeting was conducted by the Department of Social Services following standard program operation guidelines. Out of the eligible households, the evaluation team randomly selected 34–60 households in each ward, using the random number generator tool in excel. This generated a sample of 3,063 households across 90 wards. Data were collected through a detailed household survey, conducted at baseline and 12-month follow-up. The study sample size is provided in Table 2.2. At follow up, the household attrition rate was 14 per cent. As part of the impact evaluation, detailed attrition analysis was conducted, and while differential attrition was ruled

out, it was concluded that overall attrition (households remaining in the study were no longer representative of households in the original sample) might be a problem (American Institutes for Research, 2014). To correct for this problem, inverse probability weighting was used to adjust sampling weights. We use these generated analytical weights for our panel data impact analysis.

Table 2.2. Study Sample Size

	Treatment	Comparison	Total
2013	2,029	1,034	3,063
2014	1,748	882	2,630
Total	3,777	1,916	5,693

Note that all households in comparison Wards in the study sample are actual eligible households who will receive benefits once the program reaches their area, and eligibility criteria are the same across the country. Given the universal program take-up, these households thus serve as a close approximation for the counterfactual for treatment households. The distinction between this design and what might be deemed a perfect design--a social experiment-- is that Wards were not randomly assigned to treatment. In a large-scale national program where program roll out is determined by both technical (e.g. poverty) and political considerations, randomizing roll out is often not feasible. When the eligibility criteria are applied uniformly, targeting is supply-driven (as the case in Zimbabwe), and take-up is universal, the threat to internal validity in our design is the geographical differences across Phase 2 and Phase 4 areas. Our stratified matched design was chosen to minimize geographical differences.

2.4. Household Characteristics and Food Security

2.4.1. Socioeconomic Characteristics associated with Food Security

We utilize Ordinary Least Squares (OLS) to understand if the HFIAS is capturing information about a household's vulnerability that conventional food access measures, such as food consumption expenditure, are not able to detect. Theoretically, the HFIAS should inform us not just about a household's food consumption status, but also about the anxiety it experienced to sustain that level of food consumption. For ease of comparison with other indicators we positively code the HFIAS so that higher scores indicate better food security, and refer to it as Food *Security*.

Table 2.3 presents the results of the OLS analysis where our two measures of food security, the Food Security Score and Log of per capita Food Consumption Expenditure, are regressed on proximate determinants of food security using baseline data only. Since our two dependent variables are measured on different scales, we cannot directly compare coefficient estimates. However, we can compare the relative importance of factors in explaining variation in each measure. As expected, we find that the larger the household size, the lower the value of its per capita food consumption. However, the relationship between household size and the Food Security score is not significant. Female-headed households have on average about seven per cent lower value of per capita food consumption, and age of main respondent is significant across both measures, although the magnitude of the estimate is small. If the main respondent has attended school then the Food Security score is higher by 0.6 points and per capita food consumption value increases by eight percent.[6]

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[6] The main respondent is the person that is interviewed when we visit the household to conduct our survey. Typically, the main respondent is the head of the household. However, at times the head is away

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Table 2.3. Estimates of Socioeconomic Characteristics of Households Associated With Food Security Score and Per Capita Food Consumption Expenditure

	(1)		(2)	
			Log Per Capita Food Consumption $	
	Food Security Score			
Household Demographics:	Estimate	Std. Error	Estimate	Std. Error
Household Demographics:				
Household Size (log)	0.263	0.969	-1.498***	0.104
# Children under 5	-0.290	0.247	0.088***	0.027
# Children 6-17	-0.421**	0.179	0.082***	0.022
# Adults 18 - 59	-0.398	0.241	0.094***	0.017
# Elderly (>60)	-0.132	0.270	0.098***	0.029
Main Respondent Characteristics:				
Female (Yes=1)	-0.419	0.292	-0.069**	0.031
Age (Years)	-0.028***	0.010	-0.002*	0.001
Widowed (Yes=1)	-0.323	0.302	0.025	0.038
Divorced/Separated (Yes=1)	0.051	0.457	0.021	0.045
Main resp. has schooling (Yes=1)	0.601*	0.304	0.077**	0.032
Other socioeconomic Characteristics:				
Distance to Food Market (Km)	-0.077***	0.025	0.001	0.002
Distance to Input Market (Km)	0.022***	0.008	0.001	0.001
Distance to Water Source (Km)	-0.016	0.118	-0.008	0.009
Productive Assets Score[a]	0.507***	0.089	0.074***	0.008
Household Amenities Score[b]	0.528***	0.106	0.051***	0.010
# of livestock type	0.096	0.103	0.037***	0.008
Any income from wage labor? (Yes=1)	1.530***	0.462	0.151***	0.040
Any income from maricho labor? (Yes=1)	-0.787**	0.305	0.036	0.024
Planted crops last rainy season (Yes=1)	1.722***	0.514	-0.008	0.044
Labor Constrained (Yes=1)	-0.898**	0.386	-0.011	0.043
Aid received (in USD)	-0.001	0.002	0.000	0.000
Monthly remittances low (< $25/month)	-1.350**	0.518	-0.192***	0.040
Has loan outstanding (Yes=1)	-0.579	0.376	0.116**	0.045
Other covariates:				
Suffered from a shock? (Yes=1)	-1.975***	0.402	0.000	0.036
Mashona Indicator	-1.255***	0.353	0.251***	0.043
Masvingo Indicator	-1.037**	0.447	0.255***	0.036
Constant	19.010***	1.448	4.766***	0.134

when the survey team is visiting and in such cases, we interview a member of the household who is available to answer questions.

Observations	3035	3035
Adjusted R-squared	0.130	0.467

Notes:
 * p<0.1, ** p<0.05,*** p<0.01.
Standard errors clustered at the ward level. Standardized baseline weights utilized.
[a] Productive assets score obtained through Principal Components Analysis of 30 different variables that indicate ownership of assets such as tractor, plough, and other agricultural tools and total land area of the household. Based on this analysis and the scree plot shown in Appendix A Figure A.1a, we retain the first principal component as our Productive Assets score for the household, which explains 21.5 per cent of the variability in the data. The subsequent components each explain less than six per cent of the variation.
[b] Household Amenities score also obtained through Principal Components Analysis of variables that indicate ownership of the following amenities: a toilet, a cooking room, ventilation in the cooking room, access to energy for lighting within the house, household structure with more than two rooms, and sturdy walls made of bricks, stone or cement. Scree plot for this analysis is shown in Appendix A Figure A.1b. We retain the first component as the Amenities score for the household. It explains 31.3 per cent of the variation among the variables.

The main results of Table 3 are in the socioeconomic characteristics section. As expected, ownership of productive assets and presence of household amenities such as sturdy walls and toilet facilities positively impact food consumption and the Food Security score. Wage income has large significant impacts on both consumption and the Food Security score. Conversely, low level of monthly remittances, signifying absence of a strong support system, has a large negative impact on both food consumption and food security. However, some variables such as labour-constrained status of the household, which directly indicate the vulnerability of the household due to the uncertainty they introduce in the household's source for food, are significant in only explaining Food Security score, but not food consumption. Other variables that impact only the Food Security score are indicators for whether the household earns any income from casual labor (referred to in Zimbabwe as *maricho*), has planted any crops in the last rainy season, or has suffered from any shock in the last 12 months. *Maricho* or casual wage labor is the fall back option for subsistence households throughout rural Africa, and is undertaken by landless or

extremely poor households, or when the household suffers a shock or when grain stocks have run out and cash is needed. These results suggest that households smooth their consumption across time and their vulnerability in maintaining that consumption level is not immediately reflected in aggregate value of food consumption, but it is captured by the Food Security score.

2.4.2. Initial Harvest Period vs. Peak Harvest Period

We extend our vulnerability analysis by taking into account the fact that the baseline survey was implemented between April and June, so that some households were interviewed just prior to harvest and others during or just after. In an agrarian rural setting such as the one in which the HSCT was implemented, the time of the harvest can make a big difference to the food status of household members. Most rural households rely heavily on own-production of cereals, but also rely on the market, as own-production is not sufficient to meet their food requirements (FEWS NET, 2014).

Figure 2.2 provides a graphic representation of Zimbabwe's typical seasonal calendar. Zimbabwe has a unimodal rainy season lasting from November to March. This is also the main planting season of the year. Tobacco is the main cash crop of Zimbabwe and its harvest begins in March. The main maize harvest, which is the staple crop of the country, begins in May. The peak vegetable gardening and cotton-picking season then begins in July. Food insecurity starts increasing around September/October as grain stores from the last harvest are depleted by then (FEWS NET, July 2013).

Figure 2.2. Zimbabwe Seasonal Calendar
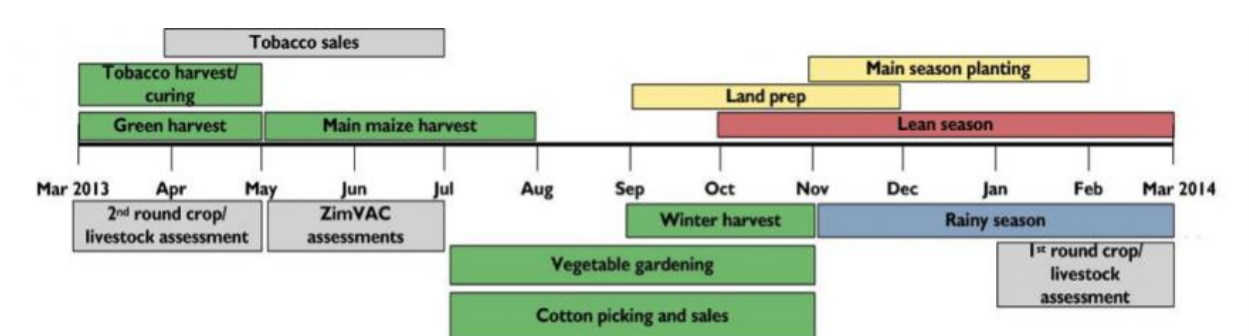
Source: Famine Early Warning Systems Network

Figure 2.3 depicts how the Food Security score progresses across April-June, the survey window for 2013, and also the period when households are beginning to move out of the lean season to initial and then peak harvest period when they are typically flush with grains from own-production. Note that the food security score is based on a four-week reference period. Households interviewed in April/May were requested to think back to March/April, when they would have not yet entered the maize harvest period. As seen in Figure 2.3, there is a discontinuity during the week of May 14-21, after which households' food security begins to progressively improve. This presents an opportunity to divide the sample according to initial vs. peak harvest period to understand if the standard set of socioeconomic and demographic factors influences food security differently in a relatively worse-off vs. better-off period. We do not include Mashonaland East in this part of our analysis since no households in that province were approached during peak harvest period.

Figure 2.3. Food Security score by Week

Baseline Survey Window: Food Security Score by Week
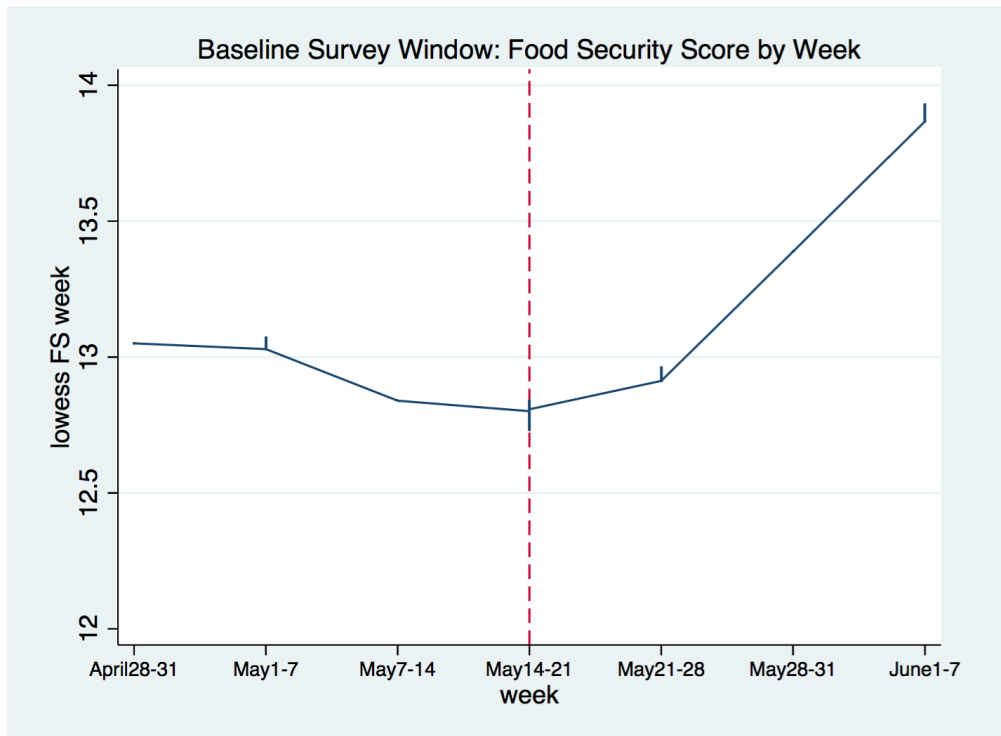
Results of our seasonality analysis are presented in Table 2.4, where we estimate a fully interacted model that allows all effects to differ between initial harvest and peak harvest period by interacting each covariate with an indicator variable for 'Pre/Initial Harvest'. Analytically, this model is equivalent to estimating separate models for the two groups, but an interacted model has the advantage of testing statistical differences between the two. We find that although the Chow tests inform us that the two groups/periods are jointly different, only a few of the individual interaction terms emerged as significant. In Table 2.4, we control for all variables as shown in Table 2.3, but here we show only those variables for which a significant interaction term emerges. The full results of the interacted model are presented in Table A.1 of the Appendix A.

Table 2.4. Results from Fully Interacted Model Comparing Pre/Initial Harvest vs. Peak Harvest

	(1) Food Security Score		(2) Log P.C. Food Consumption	
	Estimate	Interacted Estimate	Estimate	Interacted Estimate
Pre/Initial Harvest Dummy	5.799*		-0.104	
	(3.092)		(0.267)	
# Adults 18 - 59	0.103	-0.903**	0.098***	0.027
	(0.340)	(0.447)	(0.032)	(0.041)
Distance to Food Market	-0.100**	0.099*	0.005*	-0.011*
	(0.042)	(0.054)	(0.003)	(0.006)
Distance to Input Market	0.038***	-0.035*	0.000	-0.000
	(0.013)	(0.020)	(0.001)	(0.001)
Any income from maricho labor? (Yes=1)	-0.281	-1.410**	0.071*	-0.046
	(0.527)	(0.632)	(0.042)	(0.062)
Labor Constrained (Yes=1)	0.784	-3.422***	0.010	0.066
	(0.700)	(1.060)	(0.064)	(0.075)
Monthly remittances low (< $25/month)	-0.317	-2.709**	-0.141**	-0.099
	(0.774)	(1.071)	(0.070)	(0.081)
Masvingo	-0.448	-1.240	0.209***	0.149**
	(0.628)	(0.856)	(0.046)	(0.073)
Constant	15.191***		4.795***	
	(2.559)		(0.234)	
Observations	2121		2121	

Notes:

 * p<0.1, ** p<0.05,*** p<0.01.
Standard errors in parentheses, clustered at the ward level. Standardized baseline weights utilized. The model controls for all variables as shown in Table 2.3. Only significant interaction terms are shown in this table.

Maricho labour income increases food consumption during peak harvest but during pre-harvest, it hurts the food security score of households. This suggests that households that engage in *maricho* labour in the pre-harvest period are poorer and are forced to rely on casual labour. Importantly, we find that if the household is labour constrained or receives low monthly remittances, its food security is weakened in this period. Being labour constrained stands out as an especially vulnerability-inducing attribute. It is important to note that several social protection programmes throughout Africa – Ethiopia, Liberia, Malawi, Rwanda, Uganda and Zambia – utilize labour-constrained status as a targeting criterion for identifying programme beneficiaries.[7]

2.5. Impact of the HSCT Programme on Household Food Security

2.5.1. Summary Statistics

Table 2.5 reports mean characteristics at baseline for both treatment and comparison groups. We retain only the panel sample of households for this part of our analysis. There are 1,746 households in the treatment group and 880 in the comparison group. To test for baseline balance between the two groups, we use OLS regressions with clustered standard errors at the ward level (to account for clustering of households within wards). Mean differences in a set of 30 key household characteristics were tested, and none of these were found to be statistically different at the five per cent level at baseline.

Average household size in the sample is about five, with a per capita monthly expenditure of $32-33. More than two-thirds of the main respondents are women, their average

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[7] Some programme names include the Malawi Social Cash Transfer Programme, the Kenya Cash Transfer for Orphans and Vulnerable Children, Ghana's Livelihood Empowerment Against Poverty, Ethiopia's Productive Safety Net Programme–Direct Support, and the Mozambique Food Subsidy Programme (Garcia and Moore, 2012).

age is 56 years, and more than half have had at least some level of schooling. Around 25-28 percent of these households take care of one or more disabled members. In addition, around 37 percent have at least one member who is chronically ill and almost two-thirds have one or more elderly members. These characteristics contribute to a high dependency ratio, which is reflected in the large number of households that are categorized as labor constrained (about 83-84 percent of the sample[8]). That our sample should have such a high concentration of labor-constrained households makes sense because as mentioned earlier, one of the program criterions for household eligibility is labor-constrained status of the household. This demographic profile is also reflected in the unique U shape of the age distribution among HSCT households shown in Figure A.2 of Appendix A. There are a large proportion of young people (almost 60 per cent of individuals in our sample are below 18 years of age, and most are adolescents), a few working-age adults, and then the distribution again expands to indicate a higher concentration of people beyond age 60. This profile reflects the 'missing generation' problem characterizing much of sub-Saharan Africa, wherein older caregivers are providing for adolescents, because prime-age, able-bodied workers are 'missing', due to high mortality rates induced by high HIV/AIDS prevalence rates. The addition of the labour-constrained criterion in addition to food poverty is important because it led to the selection of socially vulnerable households.

Table 2.6a provides means of food security measures across our two time periods. A higher Food Security score indicates the household has higher food security and is relatively better off. Cronbach's alpha for the food security scale in the two time periods is 0.86 at baseline and 0.87 at follow-up, suggesting that the sub items of the scale have relatively high internal

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[8] The reason this is not hundred percent is because the questions used to determine labour constraint are not exactly identical in the evaluation survey and the targeting form used by ZIMSTAT, and the two sets of data were collected at different times.

consistency.[9,10] The average Food Security score increased from 13 at baseline to above 16 at follow-up, a pattern that holds for both treatment and comparison groups. This improvement is because the baseline survey window began in the pre-harvest season (April-June 2013) while the follow-up survey in 2014 was conducted entirely during peak harvest time (June-September 2014) when households are generally flush with food supplies.

Value of average household food consumption per person per month has decreased by a dollar for the treatment group and almost two dollars for the comparison group. Kernel densities of the Food Security score and log of per capita monthly food consumption are provided in Figure A.3 of Appendix A.

A widely used indicator of diet diversity is the Diet Diversity Score (DDS), which measures the number of different food groups consumed over a given reference period with a score ranging from 0 to 12, since there are 12 food groups[11] recommended for inclusion

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[9] The nine sub-items of the scale items are: 1) did you worry that your household would not have enough food?, 2) were you or any household member not able to eat the kinds of food you preferred because of a lack of resources?, 3) did you or any household member have to eat a limited variety of foods due to a lack of resources?, 4) did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?, 5) did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?, 6) did you or any household member have to eat fewer meals in a day because there was not enough food?, 7) was there ever no food to eat of any kind in your household because of lack of resources to get food?, 8) did you or any household member go to sleep at night hungry because there was not enough food?, and 9) did you or any household member go a whole day and night without eating anything because there was not enough food?

[10] Cronbach's alpha is a measure of internal consistency and is used as a measure of scale reliability. It measures how closely related a set of items are as a group. Generally, a coefficient of 0.80 or higher is considered acceptable for conducting research.

[11] The 12 food groups are: Cereals; Roots and Tubers; Vegetables; Fruits; Meat/Poultry; Eggs; Fish/seafood; Pulses and Legumes; Milk and Milk products; Oil/Fats; Sugar/honey; and Miscellaneous (species and beverages).

(Swindale & Bilinsky, 2006). Average household diet diversity based on this score increased

from about 6 at baseline to 6.76 for the comparison group and 7.16 for the treatment group.

Table 2.6b provides a correlation matrix of standard pairwise Pearson's Correlation

coefficients using 2013 (baseline) data only. Correlations are in the expected direction but are

low (correlation of Food Security score with per capita food consumption expenditure is only

13.6 per cent), suggesting, as we discussed in the previous section, that they are measuring

different dimensions. Past empirical studies have also found low correlations between

expenditure/income and a subjective food adequacy indicator (Migotto et al., 2005; Headey and

Ecker, 2012).

Table 2.5. Mean Baseline Characteristics of Sample Households

	Comparison Group		Treatment Group		*p*-value of
	Mean	Std. Error	Mean	Std. Error	difference
Household Demographics:					
Household Size	5.18	0.193	5.02	0.142	0.504
# Children under 5	0.80	0.061	0.76	0.048	0.550
# Children 6-17	2.24	0.110	2.23	0.081	0.931
# Adults 18 - 59	1.28	0.087	1.20	0.052	0.407
# Elderly (>60)	0.85	0.042	0.83	0.032	0.801
% of households that have disabled members	28.05%	0.017	25.34%	0.015	0.222
% of households that have chronically ill members	37.74%	0.024	36.71%	0.015	0.712
% of households that have elderly members	64.57%	0.028	64.12%	0.022	0.894
Main Respondent Characteristics:					
% Female	65.53%	0.021	69.65%	0.016	0.116
Age (Yrs.)	56.35	1.255	56.27	0.881	0.951
% Widowed	36.77%	0.020	37.15%	0.017	0.883
% Divorced/Separated	8.17%	0.011	9.54%	0.011	0.389
% Main resp. has schooling	60.53%	0.025	55.83%	0.019	0.129
% Main resp. currently attends school	1.32%	0.005	1.66%	0.003	0.586
Highest grade of Main resp.	3.49	0.129	3.30	0.136	0.307
Other Socioeconomic Characteristics:					
Monthly Per Capita Total Expenditure (in usd)	33.43	1.412	32.01	1.037	0.418
Monthly Per capita Food Expenditure (in usd)	20.81	1.001	20.33	0.824	0.714
HFIAS Score (1-27)	13.93	0.386	14.03	0.267	0.841
Diet Diversity Score (1-10)	6.27	0.151	5.94	0.119	0.089
Distance to Food Market (Km)	3.36	0.466	3.87	0.238	0.316
Distance to Input Market (Km)	20.51	2.246	18.74	1.477	0.508
Distance to Water Source (Km)	1.29	0.210	1.36	0.112	0.760
# of livestock type	2.29	0.085	2.21	0.082	0.477
% households that receive wages	11.09%	0.012	10.21%	0.010	0.575

% households undertaking casual/maricho labor	48.87%	0.034	46.20%	0.022	0.513
% households that planted crops last season	86.89%	0.026	90.11%	0.009	0.247
% households categorized as labor constrained	82.91%	0.020	83.97%	0.012	0.647
Aid received (in USD)	77.67	14.210	54.35	3.445	0.111
% of households that have an outstanding loan	8.85%	0.008	9.37%	0.013	0.741
% of households that have suffered from a shock	86.87%	0.020	90.04%	0.013	0.190

Notes: Attrition-adjusted weighted results, p-values obtained by clustering at ward level

Table 2.6a. Mean of Food Security Measures

	Comparison		Treatment		*p*-value baseline difference
	Baseline	**Follow-up**	**Baseline**	**Follow-up**	
Food Security Score	13.07	16.34	12.98	16.46	0.841
P.C. Food Consumption $ per month	20.81	19.09	20.33	19.33	0.714
Diet Diversity Score	6.27	6.76	5.94	7.16	0.089
N	879	880	1742	1743	

Notes: Attrition-adjusted weighted results, p-values is of baseline difference between the two groups and obtained by clustering at ward level

Table 2.6b. Correlation Matrix of Food Security Measures using Baseline Data

	Food Security Score	**P.C. Food Consumption $ per month**	**Diet Diversity Score**
Food Security Score	1		
P.C. Food Consumption $ per month	0.1361	1	
Diet Diversity Score	0.2604	0.3482	1

Notes: Attrition-adjusted weighted results

2.5.2. Empirical Methods

We utilize the longitudinal sample (containing two time periods, baseline and follow-up) to conduct a difference-in-differences (DD) analysis to estimate the impact of the programme on food security.

Equation (1):

$$Y_{hjt} = \beta_0 + \beta_1 \text{Post}_t + \beta_2 \text{Transfer}_j + \beta_3 (\text{Transfer} * \text{Post})_{jt}$$

$$+ \beta_4 \text{HHDemographics}_h + \beta_5 \text{HHMainResp}_h + \beta_6 \text{Strata}_j + \beta_7 \text{Prices}_{jt}$$

$$+ \beta_8 \text{Week}_t + \varepsilon_{hjt}$$

where

Y_{hjt} is the food security outcome of interest for household h in Ward j at time t.

Post_t is an indicator that equals '1' if the time period is 2014 (12 month follow-up).

Transfer_j is an indicator that equals '1' if the household is in a treatment Ward.

HHDemographics is a vector of baseline household demographic characteristics, which include log of household size, and the number of people below age 5, between age 6-17, between age 18-60, and those over 60.

HHMainResp is a vector of characteristics of the main respondent that includes indicators for if the main respondent is female, widowed, divorced/separated, has attended school, currently attends school, and linear variables for the highest grade attained and age.

Strata are indicators of the strata used in selecting Wards. It includes two dummies to indicate if the household was located in Mashonaland East or Masvingo. The reference strata is Mtabeleland North.

Prices$_{jt}$ refer to a vector of cluster-level prices of eight staple items.

Week$_t$ is the week in which the household is interviewed.

In this framework the variable of interest is β_3, which represents the DD programme impact. Estimation is via Ordinary Least Squares (OLS) with standard errors clustered at the level of the primary sampling unit (Ward). We use baseline values for main respondent characteristics and household demographics, while prices are maintained as exogenous and allowed to vary by time period. We tested separately to see if the programme had an inflationary effect in treatment wards and found none, a plausible finding given that the overall coverage of the programme is only 10-15 per cent in the ward.

As described earlier, the study design is a ward level longitudinal matched design where households in both comparison and treatment districts went through official program targeting. Participation in the program is not demand-driven: the program eligibility identification process determines eligibility, and there were no refusals to participate in the program among eligible households, i.e., take up is universal among the eligible. The likelihood for selection bias in this context is minimal.

The identifying assumption of the DD model is of 'parallel trends', i.e., the trajectory of the dependent variable over the study time period would be the same across treatment and comparison wards in absence of the program. As described in the Study Design section, comparison wards were 'matched' to treatment wards by a scoring system based on five variables, which cover level of development and agro-ecological characteristics, to try to

maintain the validity of this assumption. In addition, baseline balance tests indicate that

households across the treatment and comparison samples are balanced on a number of key

demographic and socioeconomic characteristics (see Table 2.5). This is as expected since all

households are eligible for the HSCT, having been selected according to the same program

eligibility criteria. This further supports the validity of the key identifying assumption.

The DD model does not control for differences between the treatment and comparison

groups on account of household or individual unobserved characteristics. Our impact estimate

(β_3 in the above equation) may be biased if there are unobserved characteristics influencing both

the program and our outcome measure. A fixed effects model at the household level can address

the issue of unobserved characteristics that are fixed over time as a source for endogeneity, and

is therefore our preferred model:

Equation (2):

$$Y_{hjt} = \alpha_h + \beta_1 \text{Post}_t + \beta_2 \text{Transfer}_j * \text{Post}_t + \beta_3 \text{Prices}_{jt} + \beta_4 \text{Week}_t + \nu_{hjt}$$

where

Y_{hjt} is the food security outcome of interest for household *h* in Ward *j* at time *t*.

α_h (*h*=1….H) is the intercept for each household (h household-specific intercepts).

Post, Prices, and Week are as described in Equation (1).

β_2 represents the impact estimate and ν_{ht} is the time-varying error term.

Standard errors are clustered at the ward level.

Note that the threat unobservable characteristics impose to the validity of our model is minimal because, as mentioned above, households in both arms are selected according to program rules and take up is universal among the eligible, so there is no self-selection into the treatment group. There is a second reason, however, why employing the fixed effects model is warranted for estimating the impact on the Food Security score. Subjective or experiential measures can lead to responder bias since some element of their predisposition or attitudinal characteristics will enter into the responses they give for the set of nine questions that comprise the food security scale. It is, therefore, important to have panel data, where we follow the same respondent from one year to the next to control for this type of responder bias. We estimate Equation (2) using only the subsample of households where the main respondent has not changed from baseline to follow-up. Out of the 2,630 households that comprise our panel sample, over 76 percent (2,007 households) have the same main respondent across the two time periods.

2.5.3. Results and Discussion

Table 2.7 provides the results of our difference-in-differences model. Given the importance of the week in which the households were interviewed, our difference-in-differences estimates control for week of interview, in addition to the standard set of baseline household demographics and main respondent characteristics, and contemporaneous prices.[1] Results using the full panel sample are shown in first half of Table 2.7. We find that per capita food consumption increased by $2 per month, which represents a ten per cent increase over baseline value of food consumption. As per the design of the programme, a household size of five (the median household size in our sample) receives $5 per person, so a $2 increase in food

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[1] Table A.2 in Appendix A shows the results of the Difference-in-Difference estimates on the full sample without controlling for week. We find significant impacts on Diet Diversity score, but not on per capita food consumption or on the Food Security score.

consumption represents forty percent of the transfer dollars the household receives. In addition, we find a statistically significant impact on Food Security and Diet Diversity scores, which have increased by 1.2 points and 0.77 points.

The HSCT programme is designed so that per capita transfer size decreases with household size. However, the transfer size increases proportionally with household members only up to a point (four members) and then remains flat at USD25 for all households greater than four members. Since the median household size in our sample is five, over 50 per cent of households have more than four members. To account for this variation in the intensity of the treatment, we restrict our sample to households with four or fewer residents (bottom panel of Table 2.7). In this case, we do not find a statistically significant average treatment effect on food consumption value or on the Food Security score. The magnitude of the impact on food consumption has more than doubled to $4.4, but the t-statistic (1.6) is below the critical threshold.

Table 2.7. Difference-in-Difference Model: Impact on Food Security Measures

	(1)	**(2)**	**(3)**
	Per capita Food Consumption $	**Household Food Security Score**	**Household Diet Diversity Score**
On the Full Sample:			
Impact Estimate	2.004*	1.238**	0.767***
	(1.160)	(0.557)	(0.198)
Treatment Indicator	-0.941	1.316***	-0.145
	(1.385)	(0.492)	(0.163)
Follow-up Indicator	-5.897*	-5.285***	0.039
	(3.274)	(1.778)	(0.639)
Week of Interview	0.253	0.813***	0.036
	(0.333)	(0.174)	(0.062)

Observations	5245	5245	5245
Adjusted R-squared	0.323	0.119	0.191

On Small Households ((Household Size<=4 members):

Impact Estimate	4.397	0.972	0.802***
	(2.722)	(0.697)	(0.258)
Treatment Indicator	-1.929	0.242	-0.359
	(2.321)	(0.589)	(0.226)
Follow-up Indicator	-11.113	-1.376	0.878
	(6.783)	(2.225)	(0.884)
Week of Interview	0.365	0.391*	-0.042
	(0.639)	(0.215)	(0.088)
Observations	2355	2355	2355
Adjusted R-squared	0.231	0.088	0.215

Notes:
* p<0.10   **p<0.05   ***p<0.01
Standard errors clustered at the Ward level in parentheses.
Estimations use difference-in-difference modeling among panel households. All estimations control for baseline household size, main respondent's gender, age, education and marital status, strata, household demographic composition, and a vector of cluster level prices.

To control for attitudinal bias in the Food Security score, we restricted the sample to only those households where the main respondent had not changed from 2013 to 2014 and run an individual fixed effects model, which controls for personality traits and other unobserved idiosyncrasies of the individual that are fixed over the one-year time period. Results are provided in Table 2.8. The impact estimate on food consumption is no longer statistically significant, in both the full panel sample as well as the subsample of smaller households. However, impact estimate on the Food Security and Diet Diversity scores are significant across both samples. The effect sizes are larger for the smaller household sample, particularly in the case of the Food Security score. One reason why we observe this may be because per person value of the transfer is higher in smaller households.

Table 2.8. Individual Fixed Effects Model: Impact on Food Security Measures

	(1) Per capita Food Consumption $	(2) Household Food Security Score	(3) Household Diet Diversity Score
On the Full Sample:			
Impact Estimate	1.159	1.734**	0.636***
	(1.798)	(0.686)	(0.223)
Follow-up Indicator	-5.019	-4.058*	0.995
	(5.693)	(2.272)	(0.800)
Week of Interview	0.331	0.666***	-0.060
	(0.480)	(0.215)	(0.074)
Observations	4002	4002	4002
Adjusted R-squared	0.012	0.190	0.168
On Small Households ((Household Size<=4 members):			
Impact Estimate	3.277	2.380***	0.692**
	(3.255)	(0.818)	(0.273)
Follow-up Indicator	-10.364	-3.254	1.467
	(10.701)	(2.824)	(0.977)
Week of Interview	0.585	0.534*	-0.090
	(0.922)	(0.269)	(0.087)
Observations	1971	1971	1971
Adjusted R-squared	0.030	0.142	0.219

Notes:
* p<0.10 **p<0.05 ***p<0.01
Standard errors clustered at the Ward level in parentheses.
Estimations control for week of interview, and a vector of cluster level prices

We find a consistent positive impact on the Diet Diversity score across all models in the range of 0.64 to 0.80 points. Table 2.9 provides a list of the 12 foodstuffs that make up the score. We find a 13 percentage point (pp) increase in the number of households consuming fruits, 16pp increase for pulses and legumes, 12pp for dairy, 15pp for fats, 13pp for sweets and finally about

6pp for miscellaneous items, which include non-alcoholic beverages and condiments. Why are these increases not consistently reflected in the food consumption measure? One answer is that the value of food consumption variable hides dynamic activity that is taking place within the household as it makes choices to obtain food from different sources. This means that even though the treatment and comparison groups may on average spend roughly the same amount on food, the cash transfer beneficiaries have more cash available. This additional cash allows them to: 1) approach the market to diversify their food basket; 2) diversify own-production to other foodstuffs, and; 3) rely less on gifts as a source for their food.

Table 2.9. Household Diet Diversity Impact Estimates

	Impact Estimate	Baseline Mean
Diet Diversity Score	0.767***	6.045407
	(0.198)	

Presence of Food Item in Diet	Impact Estimate	Baseline Mean (%)
(1)　Cereals	-0.001	99.9
	(0.001)	
(2)　Roots & Tubers	0.033	11.3
	(0.051)	
(3)　Vegetables	0.002	98.9
	(0.007)	
(4)　Fruits	0.126**	33.4
	(0.056)	
(5)　Meats	0.005	38.8
	(0.039)	
(6)　Eggs	-0.038*	6.8
	(0.020)	
(7)　Fish	0.016	22.6
	(0.037)	
(8)　Pulses & Legumes	0.161***	57.5
	(0.044)	
(9)　Dairy	0.123***	31.8
	(0.042)	

(10)	Fats	0.147***	64.1
		(0.046)	
(11)	Sweets	0.134***	46.9
		(0.035)	
(12)	Misc. (Condiments & Beverages)	0.060***	92.5
		(0.020)	
No. Of Observations		5245	2622

Notes: * p<0.10   **p<0.05   ***p<0.01
Standard errors clustered at the Ward level in parentheses
Notes: Attrition-adjusted weighted results. Estimations use difference-in-difference modeling among panel households. All estimations control for week of interview, baseline household size, main respondent's gender, age, education and marital status, strata, household demographic composition, and a vector of cluster level prices.

Table 2.10 provides baseline mean value of consumption for each of the 12 categories that make up the Diet Diversity score and disaggregated by source into own production, market purchases, and gifts. Since these households are subsistence farmers, own production is the primary source of food (~57 per cent), followed by purchases (~23 per cent), and a non-negligible amount (~21 per cent) of food is sourced from gifts (last column of Table 2.10). Cereal (in particular maize) is the staple food and accounts for 36.5 per cent of total food consumption value, followed by vegetables (23 per cent), meats (8.4 per cent) and pulses and legumes (eight per cent). Vegetables, fruits, eggs, and dairy are mostly own-produced. Over half of the cereal, roots and tubers, meat, and pulses consumption expenditure are from own-production. Fish, fats, sweets, and miscellaneous items are mostly purchased from the market. There is less variation in gifts, which account for about 20 per cent of consumption for most food items.

Table 2.10. Baseline Mean Values of Total Household Food Consumption Value by Source

(1)	Total		Own Production		Purchases		Gifts	
				% of Food Item in Col (1)		% of Food Item in Col (1)		% of Food Item in Col (1)
	in USD	% of Total Consumption	in USD	that is produced	in USD	that is purchased	in USD	that is gifted
Cereals	29.8	36.5	16.2	54.3	7.5	25.2	6.1	20.5
Roots & Tubers	0.9	1.1	0.5	52.1	0.2	22.1	0.2	25.8
Vegetables	18.8	23.0	14.6	77.5	1.6	8.3	2.7	14.2
Fruits	2.3	2.8	1.8	76.8	0.1	5.1	0.4	18.1
Meats	6.9	8.4	3.8	55.9	1.1	16.2	1.9	27.9
Eggs	0.2	0.3	0.2	78.6	0.0	16.2	0.0	5.3
Fish	1.4	1.7	0.2	17.9	0.7	48.4	0.5	33.7
Pulses & Legumes	6.6	8.0	4.5	68.1	0.3	4.6	1.8	27.3
Dairy	3.7	4.5	2.7	72.9	0.3	7.4	0.7	19.7
Fats	4.7	5.7	0.6	12.2	2.8	59.4	1.3	28.4
Sweets	2.5	3.1	0.0	0.4	2.0	77.9	0.5	21.7
Misc. (Condiments & Beverages)	3.7	4.6	1.2	31.1	2.0	52.5	0.6	16.4
Other Food	0.3	0.3	0.2	60.5	0.1	31.0	0.0	8.5
Total	81.8	100.0	46.4	56.7	18.6	22.7	16.9	20.6

Notes: Attrition-adjusted weighed means. Total number of observation is 2622

Table 2.11 provides impact estimates on each of these 12 categories, disaggregated by their source. Since cereal (maize) is the main staple food, we first look at cereals in the first row. We find that though there is no significant impact on value of total cereal consumption, there is significant activity behind this aggregate measure. The cash transfer has led to an 18 per cent increase in purchases of cereals. Almost all of it however is offset by a 21 per cent reduction in gifts. Similarly, though there is no overall impact on value of vegetable consumption, we find vegetable purchases have increased by 21 per cent, though most of this may be offset by a reduction in vegetable production and gifts. We also find a 25 per cent increase in consumption of fruits, composed of increases in own-production and purchases. Fats and sweets follow a similar pattern with significant increases in consumption, derived from market purchases. There is also a 40 per cent increase in value of pulses and legumes consumption, stemming from a 32 per cent increase in own production. These findings indicate that these households are diversifying production away from cereals to pulses and legumes, and fruits. Dairy follows a similar pattern to that of pulses – the impact estimate on total consumption value is 22 per cent, with most of it composed from an increase in own-production. Interestingly, gifts as a source of food have significantly reduced across several foodstuffs. The last row provides impact estimates on household aggregate food estimates. While there is only a nine per cent impact on value of aggregate food consumption, which is significant at the ten per cent level, this result hides the 36 per cent increase in purchases (significant at the one percent level) and 23 per cent decline in gifts (significant at the five percent level).

Table 2.11. Impact Estimates on Household Food Expenditure, Disaggregated by Source (Log of USD)

	Total	Own	Purchases	Gifts
Cereals	-0.006	-0.014	0.185**	-0.213**
	(0.047)	(0.145)	(0.089)	(0.081)
Roots & Tubers	0.081	0.038	0.043	0.005
	(0.099)	(0.073)	(0.032)	(0.037)
Vegetables	-0.093	-0.123	0.206**	-0.084
	(0.069)	(0.109)	(0.089)	(0.102)
Fruits	0.261**	0.245**	0.059**	-0.026
	(0.117)	(0.118)	(0.023)	(0.036)
Meats	0.050	0.004	0.077	-0.071
	(0.106)	(0.088)	(0.066)	(0.052)
Eggs	-0.042	-0.010	-0.021	-0.011*
	(0.026)	(0.022)	(0.015)	(0.006)
Fish	0.020	-0.028	0.043	0.017
	(0.069)	(0.030)	(0.054)	(0.043)
Pulses & Legumes	0.401***	0.324***	0.021	0.099
	(0.111)	(0.113)	(0.029)	(0.071)
Dairy	0.221**	0.120*	0.038	0.051
	(0.099)	(0.066)	(0.040)	(0.050)
Fats	0.325***	0.054	0.317***	-0.032
	(0.084)	(0.040)	(0.081)	(0.043)
Sweets	0.211***	0.007	0.280***	-0.073**
	(0.058)	(0.006)	(0.058)	(0.034)
Misc. (Condiments & Beverages)	0.115*	0.022	0.204***	-0.098**
	(0.068)	(0.052)	(0.056)	(0.039)
Total	0.088*	0.066	0.359***	-0.233**
	(0.051)	(0.082)	(0.071)	(0.098)

Notes: * p<0.10   **p<0.05   ***p<0.01

Attrition-adjusted weighted results. Standard errors clustered at the Ward level in parentheses.

Estimations use difference-in-difference modeling among 5245 panel households. All estimations control for week of interview, baseline household size, main respondent's gender, age, education and marital status, strata, household demographic composition, and a vector of cluster level prices.

2.6. Conclusion and Policy Implications

We investigated different measures of food security in the context of the Zimbabwe cash transfer programme. We analyzed determinants of household food security and food consumption, and find that variables indicative of vulnerability, such as being labour constrained, not having planted a crop last season, relying on *maricho*/casual labour, or having suffered from an income shock, are important in explaining variation in the Food Security score but do not explain variation in value of food consumption. The common theme across these variables is that they capture some of the uncertainty these households face with respect to food access. However, physical assets, household amenities, a steady wage, and monthly remittances explained variation in both value of food consumption and the Food Security score. We complement this analysis by comparing households that were interviewed during two different periods of time, one period which induced greater vulnerability than the other, to understand which factors play a protective role and which ones get accentuated during tough periods. Here we find that being labour constrained weakened food security, but has no impact on value of food consumption in the pre-harvest period. This evidence supports the programme feature of the HSCT wherein eligibility of a household to become a beneficiary of the cash transfer is determined not just by poverty but also by its dependency ratio, a proxy for labour constraints status. Given the current drought and food security crisis in Zimbabwe, social protection programmes, such as the HSCT and their methodology for identifying beneficiaries, assume even more importance.

Our impact analysis of the HSCT programme on food security and consumption supports the notion that relying on an aggregate food consumption measure is inadequate in assessing

food security. The difference-in-differences model yields an effect size of $2 per month, which

represents about forty percent of the transfer dollars the average household receives. Further, the

Fixed Effects model does not indicate any impact food consumption but there are statistically

significant impacts on the Food Security and Diet Diversity scores across all models. This is

because aggregate food consumption hides dynamic activity that is taking place within the

household that produces robust results for household diet diversity. These labor-constrained and

food-poor households depend on subsistence farming (~57 per cent of total food consumption is

own-produced) and gifts and aid (approximately 20 per cent) to make up their total food basket.

The increase in value of their food consumption is not equal to the amount of the transfer but it

allows them to rely less on gifts and aid (reduction of 23 per cent) as a source of food, the

composition of which they are not able to control. The cash transfer also enables them to make

market purchases to diversify their diet (market purchases increase by 36 percent) as well as

diversify their own production to dairy, pulse, legumes, and fruits.

Our paper has important policy implications. The right to food is recognized in Article 25

of the Universal Declaration on Human Rights and Article 11 of the International Covenant on

Economic, Social and Cultural Rights. Achieving food security and improved nutrition is the

second of seventeen proposed Sustainable Development Goals (SDGs) of the 2030 Agenda,

agreed upon by the United Nations and its member Heads of State. While progress has been

made, about 800 million people are still chronically undernourished, and one in four people

remain undernourished in sub-Saharan Africa (FAO, 2014). To accurately monitor progress, we

will need to rely on valid measures of food security that capture the uncertainty and mental stress

associated with food access. A measure such as value of household food consumption does not

provide us with the complete picture of the household's vulnerability with respect to food. This paper builds on previous research by providing evidence of the multidimensionality of food security and subsequently the usefulness of relying on a combination of measures to assess failure/success of a programme/policy instrument. Our ability to do this within the context of a large government program whose objective is to address food security enhances the external validity of the results.

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CHAPTER 3: MEDIATION ANALYSIS OF THE IMPACT OF AN UNCONDITIONAL CASH TRANSFER ON SUBJECTIVE WELLBEING

3.1. Introduction

We aim to understand how an increase in income due to an unconditional cash transfer program currently being implemented in Zimbabwe impacts the subjective wellbeing of beneficiaries. The cash received serves as an exogenous shock that allows us to isolate how an increase in income impacts subjective wellbeing. Historically, wellbeing has been measured in the context of preference satisfaction (Hicks et al, 2013) and since income is utilized to satisfy preferences, income has been the most commonly used indicator for measuring wellbeing. This model assumes a rational agent model and a functioning market economy. Another commonly used approach focuses on the satisfaction of basic human needs and rights. This approach recognizes the multi-dimensionality of 'wellbeing,' and explicitly recognizes that there are many different things in life that matter, such as health, education, physical environment, and interpersonal and political relationships fostered by prevalent institutional structures. However, a third approach has now gained prominence, which stresses the importance of taking into account the individual's self-perception of how well they are doing. Since the goal is to measure wellbeing, it is best to ask the individuals themselves, as they are most aware of their own state of wellbeing, which is a combination of both material, social, and eudaimonic aspects of their lives. Frey and Stutzer (2002) argue that a subjective approach offers a complementary approach to studying human wellbeing and importantly, it allows us to capture human wellbeing directly. People themselves weight the monetary and non-monetary (including capabilities) dimensions of

their life. While there has been an expansion in the development and usage of wellbeing

indicators that go beyond income and capabilities, such as the Happy Planet Index[13] and Gross

National Happiness Index[14], one feature of these indices is that weights are assigned to their

subcomponents and these weights reflect the priorities and preferences of policymakers.

Helliwell and Barrington-Leigh (2010) instead suggest using direct measures of wellbeing as a

way out of this problem and further, to use these direct measures to infer weights to conduct

cost-benefit analyses[15]. The Report of the Commission for the Measurement of Economic

Performance and Social Progress, also called the Stiglitz-Sen-Fitsourri report, has endorsed

collection of subjective wellbeing (SWB) data. It states that national statistical offices should be

measuring wellbeing at the individual and household level and that it is possible to collect

meaningful and reliable data on subjective as well as objective wellbeing. This has seen

operationalization in the 2013 OECD 'Guidelines on Measuring Subjective Wellbeing' (OECD,

2013).

In this paper, we focus on one component of subjective wellbeing, Satisfaction With Life.

We aim to understand how an exogenous increase in income due to the cash transfer program in

Zimbabwe impacts the beneficiaries' judgment of their overall life satisfaction. We first analyze

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[13] The HPI score is obtained by multiplying mean life expectancy of residents of a given country by their mean experienced wellbeing. It is then adjusted to reflect inequalities in the distribution of experienced wellbeing and life expectancy and divided by that country's Ecological Footprint per capita.

[14] The GNH Index is developed from the 33 indicators categorized under nine domains: Psychological wellbeing, health, education, time use, cultural diversity and resilience, good governance, community vitality, and ecological diversity and resilience. The nine domains are equally weighted but within each domain, objective indicators are given higher weights compared to subjective and self-reported indicators.

[15] However, construction of weights using SWB may be problematic because there might be 'latent heterogeneity' across individuals in their welfare weights and this in turn may be correlated with the value of the covariate associated with that individual, thus biasing the coefficient estimate (Ravallion, 2012).

the direct impact of the transfer and then analyze two specific mediators through which the additional cash income might influence life satisfaction: satisfaction of basic needs as indicated by decreased food insecurity and satisfaction of a higher level need as indicated by an increase in social participation or 'social capital.' The choice of these mediators is motivated by Maslow's theory of hierarchy of needs (Maslow, 1943), according to which need satisfaction occurs in a hierarchical manner: first are basic physiological needs, followed by safety needs, emotional needs of love and intimacy, self-esteem needs, and finally at the highest level is the need for self-actualization such as intellectual and aesthetic needs. However, Maslow recognized that reversals of this order might be observed in some outliers and that it is not required for one need to be satiated completely before the next one manifests itself. To put to test the idea of a hierarchy, we hypothesize that even at very low-income levels, money may be used to satisfy not just basic physiological needs but also higher-level needs such as social participation, which improves the person's SWB.

In 2012 Zimbabwe launched the Harmonized Social Cash Transfer Programme (HSCT), an unconditional cash transfer targeted to ultra-poor labor-constrained households. We utilize longitudinal data from a large impact evaluation conducted as part of the initial scale-up of the programme. Data was collected on 3063 program-eligible households across 90 wards in six districts. Households in three districts were slotted to enter the programme immediately, while households in the other three districts were to enter the programme in a later phase.

We find that that even in the short period of a year, the HSCT has had a positive impact on the beneficiary's perception of satisfaction with life. The total impact of the transfer on the

Satisfaction of Life score is in the range of 14 to 17 percent. The point estimate at the higher end of that range is obtained from our most robust model, the individual fixed effects model. Our mediation analyses uncovered an average causal mediation effect of about 16 percent through lowered food insecurity and 5 percent through an increase in occurrence of contributions made to social networks. Trust was not found to be a mediating factor in increasing life satisfaction in this particular context. Interviews with beneficiaries and key informants and focused group discussions reveal that while the cash transfer enabled beneficiaries to be active participants in their communities, it was also leading to tension between beneficiaries and non-beneficiaries.

This paper contributes to two distinct literatures. First, we provide new estimates on how income from unconditional cash transfer programs impacts satisfaction with life in the context of an agrarian region in sub-Saharan Africa. Moreover, this paper is the first to use the multi-item Satisfaction with Life Scale to measure subjective wellbeing in Zimbabwe. Second, we contribute to the literature on how income, basic needs fulfillment and SWB are related, i.e. we investigate the mechanisms by which the cash transfer is able to impact SWB. From a policy perspective, it is important to understand how the cash transfer is able to influence overall life satisfaction. This informs the design and implementation of this policy, and others like it, to help maintain their effectiveness.

3.2. Literature Review

People's evaluation of their lives fall into two categories, affective and cognitive (Diener, 2000). The focus of this paper is on cognitive evaluation, by which we mean a person's judgment on overall satisfaction with their life or certain specific aspects of their life such as health, job, or

relationships. Cognitive evaluation demands that the individual reflects on his/her life. In contrast, affective evaluation refers to the experience of pleasant emotions and moods (positive affect) and unpleasant emotions and moods (negative affect). Measuring the affective component requires different research methods such as experience-sampling methods (ESM), the Day Reconstruction Method (DRM), and physiological methods. According to the review contained in the World Happiness Report Update (Helliwell et al, 2016), life evaluations are more closely related to life circumstances, rather than events that have occurred the day or week the interview question was posed to the respondent. Consequently, this paper focuses on cognitive evaluation by the individual of their wellbeing.

There are three ways in which life evaluation is typically measured in the wellbeing literature. One method, adopted by the World Values Survey, is to simply ask a single question, 'All things considered, how satisfied are you with your life as a whole these days?' A second method used by the Gallup World Poll, called the Cantril Ladder question, asks respondents to rate their life on a ladder that has ten steps, numbered from zero to ten. Zero represents the worst possible life and ten the best possible life. Initially it was assumed that since the Cantrill ladder question uses the ladder as a framing device, responses to this question would be more influenced by income than responses to the life satisfaction question. However that was not found to be true. Instead, studies utilizing data from several countries have found very similar coefficient estimates of socio-economic factors explaining variability in both these two life evaluation measures (Helliwell et al, 2016; Helliwell and Barrington-Leigh, 2010). A third instrument, which we use in this paper, is the Satisfaction with Life Scale (SWLS), (Diener et al.

1985). The SWLS asks the respondent to rate the following five questions, from 'Strongly Disagree' to 'Strongly Agree':

- In most ways my life is close to my ideal

- The conditions of my life are excellent

- I am satisfied with my life

- So far I have gotten the important things I want in life

- If I could live my life over, I would change almost nothing

Life satisfaction score of the respondent is the mean of the five items. High scores on the SWLS indicate greater satisfaction with one's life. Diener et al (2009) state that experiments with different scales suggest that scales with more options and an odd number of options should be preferably utilized. We retained the odd number of options but chose a five-point scale over a seven-point scale that Diener et al. (1985) had used to obtain the average score for each participant. We did this to make it easier for the respondent to answer since the complete household questionnaire was already quite detailed. The impact evaluation team trained the team of enumerators and team leaders for a period of one week prior to each round of data collection. After training, the survey instrument was pilot tested, to ensure the questions were being asked and understood in the right manner.

The SWLS has been extensively used and validated. It is more reliable than the single-item question because it is a sum of multiple items that measure the same construct and errors are reduced through aggregation (Krueger and Schkade, 2008; Rojas, 2008; Eid and Diener, 2004; Pavot and Diener, 2008). Despite being the preferred option over the single-item question, it has not been adopted as widely due to survey length constraints. Coefficient alphas for the

scale have been shown to range from 0.79 to 0.89 in several studies indicating high internal consistency (Pavot and Diener, 2008) Test-retest reliability has also been high with coefficients ranging from 0.84 to 0.80 for one-month interval and 0.54 over four-year span, indicating moderate temporal stability but also that SWLS is subject to change over time and thus sensitive to life events (Pavot and Diener, 2008; Kobau et al, 2010).

However, there are challenges associated with using self-reported subjective measures. Answers may depend on the mood of the respondent that particular day or misinterpretation of the question by an individual respondent or even an incapacity to articulate or translate their overall wellbeing into digits on a cardinal scale. Yet, many of these errors are random and do not bias estimation results. In a comprehensive review of studies across the globe, Diener et al (2009) conclude that standard wellbeing indicators have adequate reliability and validity to draw inferences about an individual's wellbeing. An inherent challenge in measuring subjective and experiential constructs is that of scale heterogeneity[16] or systematically different threshold levels. If this heterogeneity is correlated with covariates of subjective welfare then regressions using these measures as the dependent variable will yield biased results (Bertrand and Mullainathan, 2001). This is similar to the issue of unobserved personality traits that influence both the individuals' socio-economic characteristics and how they respond to subjective wellbeing questions. Ravallion et al (2016) find evidence that subjective welfare regressions are robust to scale heterogeneity. They find that though scale heterogeneity is a concern for interpersonal comparisons of welfare, it does not pose a hurdle to conduct analysis of determinants of

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[16] Scale heterogeneity means that respondents interpret and answer these questions relative to their personal frame of reference, or more formally, the thresholds of these scales, i.e. "the values of the underlying welfare metric at which ordinal responses on the stipulated scales change" (Pg 698, Ravallion et al, 2016) are idiosyncratic and not constant from one person to another.

subjective welfare. The issue of bias arising due to unobserved personality traits can be dealt with by using panel data, which surveys the same individual over time, as we do in this paper,

From a policy perspective, it is important to understand how an individual's life circumstances in specific domains such as income, health, or education can impact their overall life satisfaction. One well-studied relationship is that of income. Previous studies have found this relationship to be curvilinear (Howell et al 2013; Cummins et al 2011; Howell and Howell 2008; Diener and Biswas-Diener, 2002; Diener and Diener, 1995). There is a strong positive relationship between the two at lower levels of income/wealth and a weaker relationship at higher levels of income. This finding, which is basically a diminishing marginal effect of money on SWB, has been explained by several theories. Relative income theory (Easterlin, 1974), and Adaptation level theory (Brickman et al 1978) explain the weak association between income and SWB. Cummins (2012) has explained this phenomenon by describing income as an 'external buffer' for maintaining SWB homeostasis. Cummins uses the word 'homeostasis' to drive home the analogy that just like the human body physiologically maintains its body temperature, similarly the human mind aims to maintain a set level of SWB. However, Adaptation Level theory, according to which any changes in life evaluations are temporary and people return to their baseline as soon as they adapt to new circumstances, has been rejected in light of recent evidence. The World Happiness Report (Helliwell et al, 2016) reports that life evaluations differ both, across countries and within countries, and that these differences can be explained by different life circumstances. The report also cites studies which show that migrants tend to have life evaluation scores that are similar to residents of the country they have migrated to, rather

than of comparable residents in the countries they came from. Further, certain events like major

disabilities and unemployment have a substantial and sustained impact on SWB.

So what are the specific life circumstances that are driving differences in SWB? The

World Happiness Report (Helliwell et al, 2016) uses individual life evaluations (about 1000 per

year in each country) to rank 156 countries by their happiness levels, as measured by the Cantril

ladder question, and analyzes the distribution of happiness both within and across countries.

Their latest update released in March 2016 utilizes data from 2005-2015 to explain variability in

the national annual average life evaluation scores with the help of six key variables. They find

that almost 75 percent of the variation can be explained by these variables alone, in the following

order of importance: GDP per capita, social support, healthy life expectancy, social freedom,

generosity and absence of corruption. The team of researchers behind the World Happiness

Report have previously reported and published similar results (Helliwell and Barrington-Leigh,

2010). They note that these same factors explain life evaluations within several countries in

similar ways[17]. However, they make a key point, "Because international differences in income

are even greater than differences in the social context, they explain a larger fraction of

differences in subjective well-being among countries than among individuals within the same

country" (Helliwell and Barrington-Leigh, 2010, pp.733).

Helliwell and Barrington-Leigh (2010) note that though drivers of SWB are the same

across countries, the relative importance of these drivers may vary. In their comparison of OECD

and non-OECD countries, they find that non-economic factors may be more important in

[17] Coefficients of these explanatory variables obtained using pooled global samples of individual data
were identical to the means of these coefficients obtained from regressions using separate country
samples.

determining SWB in countries with higher average income or institutions. This phenomenon is in line with Need Theory, which extends Maslow's theory of hierarchy of needs (Maslow, 1943). At lower levels of income/wealth, money is used to fulfill basic physiological needs such as food, water, and shelter, and therefore there is strong positive relationship of money with SWB. Higher-order needs are complex and require more than money to be satiated. This has led to the common assumption that for people living at or below the poverty line, income or wealth contributes to happiness because it is (or even should be) used for fulfillment of basic needs. However, using data from Thailand, Guillen-Royo et al. (2013) argue that wealth might contribute to happiness for personal or symbolic reasons, which are not related to basic needs, even in poor settings. Similarly, Ng et al (2014) use structural equation modeling in their study on underprivileged children in Hong Kong to find that hopeful thinking and perceived community support predict children's satisfaction with life, and that community support plays a critical mediating role in the impact of hope on life satisfaction.

As mentioned above, after income, the World Happiness Report (Helliwell et al, 2016) finds social support to be the next most important determinant. They measure social support through a binary variable asking respondents if they have someone, family or fiends, they can count on to help them if needed. Previous research has also demonstrated that social capital is an important predictor of overall life satisfaction (Helliwell & Putnam, 2004; Yip et al. 2006; Cramm et al, 2010; Han et al., 2013). An important challenge in this research is to operationally define social capital and agree on valid measures of this construct. Currently, researchers follow the practice of measuring both the 'structural' dimension of social capital (number of network connections and participation in organizations) and cognitive dimension of social capital

(attitudes such as trust, reciprocity, and mutual help). Han el al (2013) use data on 5,934 individuals in Seoul, South Korea, and find that social capital, both at the individual level and area-level, is positively associated with SWLS. They measure social capital using organizational participation (measured by involvement in 11 different organization types using a five-point Likert scale and then coded as a binary variable indicating individuals who had not participated in any organization), perceived helpfulness (measured by one item: ''There is no one whom I can get a help or lean on in times of trouble''), and a third variable indicating trust in authorities. Yip et al (2006) use multi-level modeling to analyze if social capital increased wellbeing in rural China. Their sample included 1,218 individuals in 48 villages. They find that cognitive social capital (as measured by a composite index constructed from 12 questionnaire items on trust, reciprocity, mutual help, etc.) is positively associated with SWL. However, they do not find a statistically significant association between SWL and structural social capital, as measured by organizational membership.

Research on how income from cash transfer programs impacts satisfaction with life is scarce but beginning to grow. Attah et al (2016) provide qualitative evidence obtained through key informant interviews and focus group discussions from Kenya, Ghana, Zimbabwe, and Lesotho to describe that the cash is enhancing the psychosocial wellbeing[18] of beneficiaries (expenditure on basic needs of children such as food, soaps and uniforms is leading to a sense of self-esteem amongst children), which in turn affects educational outcomes. They also cite wider

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[18] They define 'psychosocial' wellbeing as the dynamic relationship that exists between internal psychological processes (such as self-esteem, self-respect, and self-reliance) with psychological states (persons capacity to cope with stress) and external social processes (the ability to engage in meaningful and effective relationship with others).

impacts on psychosocial wellbeing such as autonomy, self-reliance and ability to become an active participant in social life.

This paper is part of the Transfer Project, a research consortium led by UNICEF, FAO and UNC-CH which partners with national governments to understand the overall impacts of national cash transfer programs in Sub-Saharan Africa. Within the Transfer Project, one aim is to systematically assess the impact of such programs on dimensions of non-monetary wellbeing, including self-assessed or subjective wellbeing. Results from evaluation reports, in addition to survey tools and description of study designs are available at the project website (https://transfer.cpc.unc.edu). Specific results from the Malawi Social Cash Transfer Program, one of the Transfer Project studies, show promising results in terms of SWB, with an increase of 20 percentage points in the proportion of beneficiaries who think their life will be better in two years, and a 18 percent improvement in a quality of life scale (Kilburn, Handa, Angeles, Mvula & Tsoka, 2016).

Haushofer and Shapiro (2016) use a randomized control trial to estimate the impact of a large lump-sum cash transfer provided by the NGO GiveDirectly on rural households in Western Kenya between 2011 and 2012. OLS estimates indicate that the transfer led to a 0.16SD increase in happiness, and a 0.17 SD increase in life satisfaction. The happiness and life satisfaction variables are single-item questions taken from the World Values Survey. Our paper in contrast uses a multi-item scale to measure SBW, and looks at the effect of smaller, regular payments, which is an important feature of national social protection programs. We also explicitly look at mechanisms through which changes in income affect SWB.

3.3. Research Setting and Design

3.3.1. The Zimbabwe Harmonized Cash Transfer Program

We use data collected for the evaluation of the Harmonized Social Cash Transfer (HSCT) Programme, an unconditional cash transfer program, introduced in 2011 by the Government of Zimbabwe. Program implementation is being done in a phased manner by district and it is anticipated that eventually the Program will cover the entire country. In January 2016, the Program covered 52,500 households and approximately 300,000 households across the country are expected to be eligible to receive benefits once the program is taken to scale.

The program is targeted at households that are *food-poor and labor constrained*. It is structured such that the size of the transfer varies with household size: a one-person household receives USD10, two-person receives USD15, three-person receives USD20, and a household made up of four or more persons receives USD25. The program thus provides between $10 and $25 per month, which represents about 20 percent of total household consumption expenditure. Eligible households are identified through a detailed targeting census that is conducted by ZIMSTAT, the national statistical agency. All households are screened using the targeting survey fielded by ZIMSTAT, and data is then processed to compute a proxy poverty score, which serves as the first eligibility criterion. A household is considered food-poor when it is living below the food poverty line[19] and is unable to meet the most basic needs of its members. A list of ten indicators that measure the ability of the household to meet basic needs is used to determine

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[19] Food poverty line is the threshold where total household expenditure is below what is required to meet the food energy requirement for each household member, set at 2,100 kcal/day/person.

eligibility on this criterion.[20] At least three of these have to be met for the household to be eligible for the Program.

The Program has a clearly defined approach for categorizing a household as labor constrained, which is the second eligibility criterion. Throughout the paper, we use this definition to operationalize the attribute of being labor constrained. A household is considered labor constrained when:

1. There is no able bodied household member between 18-59 years who is fit for productive work, OR

2. The dependency ratio is three or more, i.e., one fit to work household member between 18-59 years has to take care of three or more dependents. Dependents are those household members who cannot or should not work because they are under 18 years of age or they are elderly (over 59 years of age) or they are unfit for work because they are chronically ill or disabled or still in school, OR

3. The dependency ratio is between two and three and the household has a severely disabled or chronically sick household member who requires intensive care.

3.3.2. Study Design

The phased roll out of the HSCT allows us to use households in regions slotted to enter the program at a later date to form a comparison group. Within districts the program operates at

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[20] The 10 indicators as given in Form1R, which is used for assessing eligibility are: only one or no meals per day; grains lasted for less than three months last harvest season; no/minimal livestock; no blankets; no rooms/huts for sleeping; rudimentary house material; live on begging or some piece work; get no/minimal regular support from relatives or others; have no valuable assets, e.g. animal drawn cart, vehicle; and the household is landless or owns less than one acre.

an administrative unit known as the Ward. Child Protection Committees (CPCs) are formed within each Ward who are responsible for ensuring that targeting of households is conducted thoroughly and who are in charge of communication of program rules and operational activities (such as payment dates) between the district social welfare office and beneficiary households. The geographic area of a Ward varies by population density as each Ward comprises a cluster of anywhere from 10-20 villages. The Ward comprises the primary sampling unit for the sample design.

Phase 1 of the HSCT expansion occurred in 2011-12 and covered ten districts. Wards for the treatment group of the evaluation were selected from Phase Two areas, which entered the program in 2013. Wards for the control group were selected from areas that were slotted for Phase Four expansion and that were geographically adjacent to Phase Two areas. A detailed analysis of all Wards in three Phase Two districts of the program (Mudzi, Mwenezi, and Binga) and three Phase Four districts (UMP, Chiredzi, and Hwange), was then conducted by the study team led by the national research partner Ruzivo Trust based in Harare. Each Ward was assigned a point score based on five characteristics: forest cover, nearness to main roads, resistance to shocks, nearness to business centers, and water sources. On each criterion a Ward was scored from 1 (low) to 3 (high) and the maximum score possible was thus 15[21]. Power calculations based on the expected number of households per Ward indicated that a total of 60 Treatment and 30 Comparison Wards were necessary for the study.[22] The 60 treatment Wards were stratified

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[21] Details of the Ward level analysis are available upon request.

[22] Sample size calculations were based on the power to detect a meaningful change in the height-for-age z-score of children under age 60 months, the indicator for which the largest effective sample size was required (Handa et *al.*, 2013).

across the three treatment districts, and the 30 comparison Wards were likewise stratified to areas adjacent to the three treatment districts.

Wards in treatment areas were ranked from highest point score (most vulnerable) to lowest and paired within each stratum. Then, for each treatment Ward pair with a given score, a comparison Ward with the same score in the same stratum was selected to serve as the 'matched' comparison Ward. In cases where more than one comparison Ward existed with the same score, one was picked randomly. In cases where no comparison Ward existed with the exact same score, the Ward with the closest point score was selected. Figure 3.1 provides a map showing the geographic location within Zimbabwe of the study sites.

Figure 3.1. Map of Zimbabwe
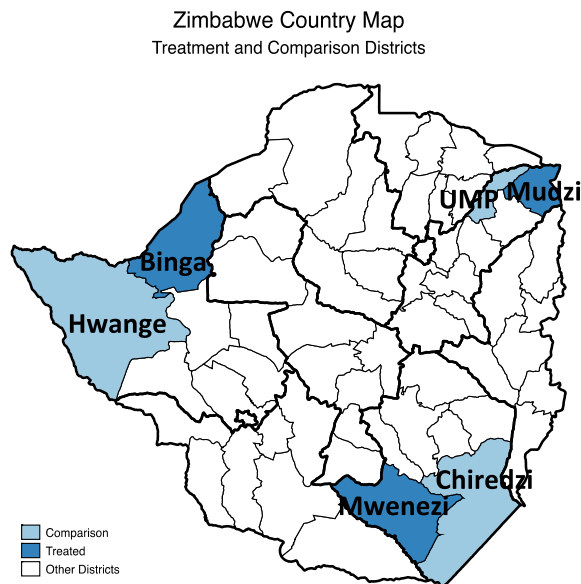
Zimbabwe Country Map
Treatment and Comparison Districts

Source: Constructed using Stata 13.1. The darker outlines in the map are province boundaries.
Shape files obtained from http://www.gadm.org/

In the selected study Wards (both treatment and comparison), program targeting was conducted by the Department of Social Services following standard program operation

guidelines. Out of the eligible households, the evaluation team randomly selected 34–60

households in each ward, using the random number generator tool in excel. This generated a

sample of 3,063 households across 90 wards. Data were collected through a detailed household

survey, conducted at baseline and 12-month follow-up. The study sample size is provided in

Table 3.1. Note that all households in comparison Wards in the study sample are actual eligible

households who will receive benefits once the program reaches their area, and eligibility criteria

are the same across the country. Given the universal program take-up, these households thus

serve as a close approximation to the counterfactual for treatment households. The distinction

between this design and what might be deemed a perfect design--a social experiment-- is that

Wards were not randomly assigned to treatment. In a large-scale national program where

program roll out is determined by both technical (e.g. poverty) and political considerations,

randomizing roll out is often not feasible. When the eligibility criteria are applied uniformly,

targeting is supply-driven (as is the case in Zimbabwe), and take-up is universal, the only threat

to internal validity in our design is the geographical differences across Phase Two and Phase

Four areas. Our stratified matched design was chosen to minimize geographical differences.

Table 3.1. Study Sample Size

	Treatment	Comparison	Total
2013	2,029	1,034	3,063
2014	1,748	882	2,630
Total	3,777	1,916	5,693

3.3.3. Attrition

As can be seen from Table 3.1, at follow-up the household attrition rate was 14 percent.[23] Table 3.2 provides results for general attrition analysis. It provides baseline means for two samples. The first is the panel sample that is comprised of households that are in the study both at baseline and follow-up. The second sample is the attrited sample that is comprised of households that were not interviewed at follow-up. P-values of the differences in means between the two samples are found to be significant, thus indicating that overall attrition might be a problem (households remaining in the study may be no longer representative of households in the original sample). To correct for this, inverse probability weighting was used to adjust sampling weights. We use these generated analytical weights throughout our analysis, where applicable.

Table 3.3[24] provides results of our differential attrition analysis. Mean values across treatment and comparison groups are provided for both the panel sample and the attrited sample. P-values of the differences in means between treatment and comparison are not significant, thus ruling out selective attrition. Finally, in Table B.1 of Appendix B we provide linear probability estimates of the probability of attrition. In only two cases out of sixteen, do we find that the coefficient of that variable interacted with the treatment dummy is significant, thus implying that probability of attrition as explained by that particular variable is higher for treatment group compared to the comparison group.

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[23] The study sites are sparsely populated with households often living in deep isolation. It was thus not always logistically feasible to return to households multiple times if no one was at home at the time of visit.

[24] For a detailed analysis of attrition that utilizes a longer list of variables than shown in the tables here, please see 12-month Impact Evaluation report (American Institutes for Research, 2014).

Table 3.2. Household Level General Attrition

Household Demographics:	Panel			Attrited			p-Value: Comparing Panel and Attrited
	N	Mean	Std Dev.	N	Mean	Std Dev.	
Household Size	2630	5.175	2.854	433	4.463	2.705	0.000
# Children under 5	2630	0.773	0.946	433	0.783	0.969	0.855
# Children 6-17	2630	2.288	1.788	433	1.883	1.721	0.000
# Adults 18 - 59	2630	1.246	1.198	433	1.089	1.086	0.012
# Elderly (>60)	2630	0.864	0.760	433	0.684	0.681	0.000
% households that have disabled members	2630	0.267	0.443	433	0.234	0.424	0.170
% households that have chronically ill members	2630	0.374	0.484	433	0.333	0.472	0.085
% households that have elderly members	2630	0.654	0.476	433	0.574	0.495	0.015
% households categorized as labor constrained	2630	0.838	0.369	433	0.781	0.414	0.021
Main Respondent Characteristics:							
% Female	2630	0.678	0.467	433	0.683	0.466	0.791
Age	2624	56.795	19.205	430	53.998	20.429	0.024
% Widowed	2630	0.362	0.481	433	0.400	0.490	0.275
% Divorced/Separated	2630	0.090	0.286	433	0.087	0.282	0.836
% Main resp. has schooling	2623	0.563	0.496	432	0.635	0.482	0.034
% Main resp. currently attends school	2623	0.014	0.118	432	0.022	0.148	0.218
Highest grade of Main resp.	2599	3.281	3.685	427	3.752	3.768	0.091
Household Characteristics:							
Monthly Per Capita Total Expenditure (in usd)	2630	31.743	25.298	433	37.158	32.059	0.002
Monthly Per capita Food Expenditure (in usd)	2630	20.008	18.618	433	23.100	21.382	0.006
HFIAS Score	2630	13.985	6.157	433	14.175	6.048	0.709
% households that have suffered from a shock	2628	0.893	0.309	432	0.875	0.331	0.235
% households affected by flood	2628	0.039	0.193	432	0.023	0.150	0.129
% households affected by drought	2628	0.449	0.497	432	0.406	0.492	0.177

Notes: Weighted results using original baseline weights, *p*-values obtained by clustering at ward level.

Table 3.3. Household Level Selective Attrition

	Panel				p-Value	Attrited				p-Value
	Comparison		Treatment			Comparison		Treatment		
Household Demographics:	N	Mean	N	Mean		N	Mean	N	Mean	
Household Size	882	5.28	1748	5.13	0.534	152	4.45	281	4.47	0.951
# Children under 5	882	0.81	1748	0.76	0.546	152	0.77	281	0.79	0.883
# Children 6-17	882	2.29	1748	2.29	0.982	152	1.82	281	1.91	0.617
# Adults 18 - 59	882	1.31	1748	1.22	0.411	152	1.16	281	1.05	0.475
# Elderly (>60)	882	0.87	1748	0.86	0.828	152	0.68	281	0.68	0.991
% households that have disabled members	882	28.55	1748	25.95	0.267	152	24.92	281	0.23	61.30
% households that have chronically ill members	882	38.38	1748	37.03	0.626	152	32.73	281	0.34	89.00
% households that have elderly members	882	65.66	1748	65.25	0.905	152	54.64	281	0.59	55.30
% households categorized as labor constrained	882	82.93	1748	84.16	0.600	152	76.78	281	78.69	68.30
Main Respondent Characteristics:										
% Female	882	65.02	1748	0.69	13.80	152	66.90	281	69.04	0.619
Age	879	56.92	1745	56.74	0.904	151	54.85	279	53.58	0.656
% Widowed	882	35.86	1748	36.35	0.849	152	40.04	281	39.95	0.991
% Divorced/Separated	882	8.05	1748	9.39	0.372	152	4.41	281	10.80	0.017
% Main resp. has schooling	881	59.42	1742	55.00	0.167	152	69.32	280	60.60	0.114
% Main resp. currently attends school	881	1.13	1742	1.54	0.439	152	2.16	280	2.28	0.937
Highest grade of Main resp.	875	3.39	1724	3.23	0.400	152	3.95	275	3.65	0.501
Household Characteristics:										
Monthly Per Capita Total Expenditure (in usd)	882	32.45	1748	31.45	0.572	152	37.55	281	36.97	0.887
Monthly Per capita Food Expenditure (in usd)	882	20.18	1748	19.94	0.903	152	25.25	281	22.06	0.360
HFIAS Score	882	13.92	1748	14.01	0.855	152	12.92	281	14.78	0.020
% households that have suffered from a	882	87.24	1746	90.19	0.215	152	83.35	280	89.58	0.114

shock

% households affected by flood	882	3.30	1746	4.09	0.633	152	2.62	280	2.14	0.790
% households affected by drought	882	40.27	1746	46.80	0.117	152	39.42	280	41.10	0.818

Notes: Weighted results using original baseline weights. p-values are provided for the test of statistical difference between comparison and treatment group values at baseline. p-values obtained by clustering at ward level.

3.4. Summary Statistics

3.4.1 Balance

Table 3.4 reports mean characteristics at baseline for both treatment and comparison groups. There are 1,746 households in the treatment group and 882 in the comparison group. To test for baseline balance between the two groups, we use OLS regressions with attrition-adjusted standardized weights and clustered robust standard errors at the ward level to account for clustering of households within wards. None of the 29 key household variables listed were found to be statistically significantly difference across treatment and comparison groups.

The average household in the sample has a household size of about five with a per capita monthly expenditure of around $33-$35. Around 25-28 percent of these households take care of one or more disabled members. In addition, around 37 percent have at least one member who is chronically ill and almost two-thirds have one or more elderly members. These characteristics contribute to a high dependency ratio, which is reflected in the large number of households that are categorized as labor constrained (about 83-84 percent of the sample), which is of course a key program eligibility criterion. More than two-thirds of the main respondents are women, their average age is around 56-57 years, and more than half have had at least some level of schooling. About 10-11 percent households have a member that works for wages, but most of them are dependent on casual labor, what is known as 'maricho' labor in Zimbabwe—this is viewed as the least desirable form of work in rural areas of Africa. Aid received during the year is substantially lower for the treatment group.

Table 3.4. Baseline Mean Characteristics of Panel Sample Households

	Comparison Group		Treatment Group		
	Mean	Std. Error	Mean	Std. Error	*p*-Value
Household Demographics:					
Household Size	5.14	0.21	5.02	0.14	0.637
# Children under 5	0.80	0.06	0.76	0.05	0.618
# Children 6-17	2.21	0.12	2.23	0.08	0.937
# Adults 18 - 59	1.27	0.09	1.20	0.05	0.479
# Elderly (>60)	0.85	0.04	0.84	0.03	0.809
% households that have disabled members	27.78	0.02	25.29	0.01	0.267
% households that have chronically ill members	37.37	0.02	36.83	0.01	0.844
% households that have elderly members	64.80	0.03	64.17	0.02	0.857
% households categorized as labor constrained	82.95	0.02	84.01	0.01	0.641
Main Respondent Characteristics:					
% Female	65.90	0.02	69.56	0.02	0.173
Age (Yrs)	56.68	1.40	56.29	0.88	0.808
% Widowed	37.30	0.02	37.09	0.02	0.944
% Divorced/Separated	8.08	0.01	9.57	0.01	0.350
% Main resp. has schooling	60.92	0.03	55.84	0.02	0.111
% Main resp. currently attends school	1.30	0.01	1.66	0.00	0.573
Highest grade of Main resp.	3.47	0.12	3.30	0.14	0.334
Household Characteristics:					
Monthly Per Capita Total Expenditure (in usd)	34.96	2.46	32.41	1.14	0.351
Monthly Per capita Food Expenditure (in usd)	22.11	1.79	20.62	0.88	0.459
HFIAS Score (1-27)	13.87	0.40	14.04	0.27	0.747
# of shocks experienced	2.44	0.21	2.69	0.13	0.310
% households that have suffered from a shock	86.09	0.02	90.07	0.01	0.148
% households where death has occurred in 12 mo	8.68	0.01	10.26	0.01	0.229
# of livestock type	2.27	0.09	2.20	0.08	0.571
% households that receive wages	10.97	0.01	10.24	0.01	0.642
% households undertaking casual/maricho labor	48.49	0.03	46.22	0.02	0.581
Aid received (in USD)	76.85	14.04	54.25	3.43	0.122
Distance to Food Market (Km)	3.34	0.46	3.87	0.24	0.310
Distance to Input Market (Km)	20.40	2.23	18.74	1.47	0.537
Distance to Water Source (Km)	1.29	0.21	1.36	0.11	0.748

N	882	1746

Notes: Attrition-adjusted weighted results. *p*-values obtained by clustering at ward level.

3.4.2. Satisfaction with Life and Mediators

Cronbach alpha for the Satisfaction with Life scale is 0.84 for baseline, follow-up, and both waves combined. This indicates that sub items of the scale have acceptably high internal validity for the scale. As per theory, factor analysis reveals a single construct behind the scale (see scree plot shown in Figure 3.2)

Figure 3.2. Scree Plot of the SWLS Scale
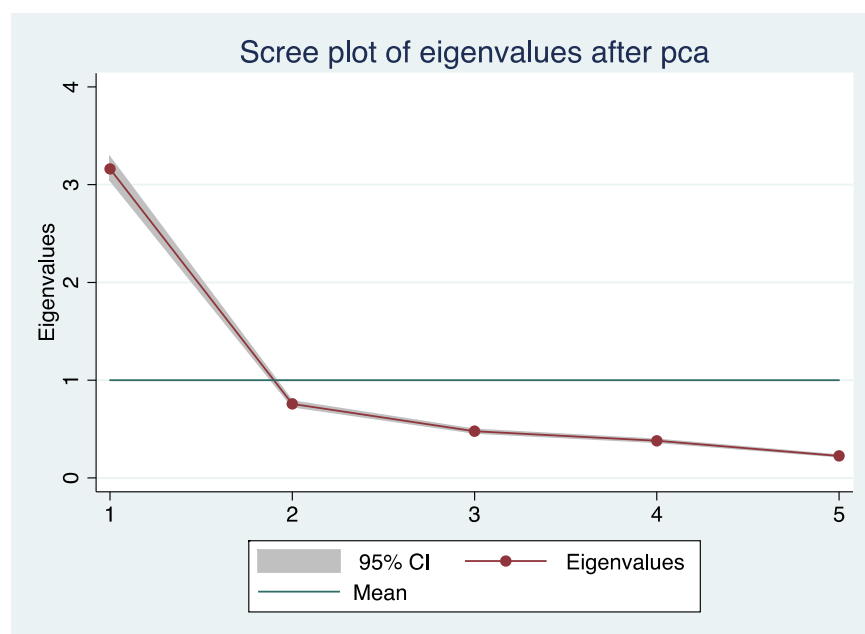
Table 3.5a provides means of Satisfaction of Life scores across our two time periods. The total score ranges from 5 to 25. A higher score indicates greater life satisfaction. At baseline the average score for the Treatment group is 9.53 and for the Comparison group it is 9.92. The difference between Treatment and Comparison group at baseline is statistically significant for the total score at the eight percent level. Table 3.5a also provides average score for each of the sub-

items, and there is no statistically significant difference between the two groups at baseline, with the exception of one sub-item, 'The conditions of my life are excellent,' which is statistically significant at the five percent level.

We find that average scores have increased from baseline to follow-up for both groups. Figure 3.3a provides the kernel density of the Satisfaction with Life score, both in absolute value and in log of the total score. To understand which sub-items are driving the increase, Figure 3.3b provides a stacked bar chart showing responses to each of the options available for the five sub-items as percent of the total. In each case, the percentage of respondents who indicated they 'Strongly Disagree' with the five affirming statements that make up the scale has decreased from baseline to follow-up. Also, in each case the percentage who 'Agree' or 'Strongly Agree' has increased, as indicated by the increasing width of the darker colored boxes. For example, almost half (44 percent) of the respondents at baseline indicated that they strongly disagreed with the statement 'In most ways my life is close to my ideal.' This decreased to 27 percent at follow-up. The percent of respondents who indicated that they were neutral, i.e., neither agreed or disagreed, has increased from 17 percent to 30 percent, and the percent of respondents who 'Strongly Agreed' doubled from about four percent at baseline to seven percent at follow-up. This same pattern is evident for the remaining four sub-items too.

Table 3.5a. Average Satisfaction with Life Scores by Treatment and Comparison Groups

	Treatment Group		Comparison Group		p-value of baseline difference
	Baseline	**Follow-up**	**Baseline**	**Follow-up**	
Log of SWL score	2.17	2.39	2.22	2.32	0.05
Satisfaction with Life Score	**9.53**	**11.69**	**9.92**	**10.90**	**0.08**
In most ways my life is close to my ideal	1.83	2.30	1.92	2.20	0.10
The conditions of my life are excellent	1.77	2.24	1.88	2.13	0.03
I am satisfied with my life	2.00	2.60	2.06	2.39	0.32
So far I have gotten the important things I want in life	1.85	2.18	1.97	2.06	0.10
If I could live my life over, I would change almost nothing	2.07	2.36	2.09	2.11	0.70
I feel positive about my future (%)	13.17	29.42	12.21	19.12	0.68
I generally feel happy (%)	29.68	48.87	29.62	41.98	0.98
N	1744	1745	878	881	

Notes: Attrition-adjusted weighted means, *p*-values obtained by clustering at ward level

Figure 3.3a. Kernel Density of Satisfaction with Life Score
The SWL scale score ranges from 5 to 25.

A. Satisfaction with Life score
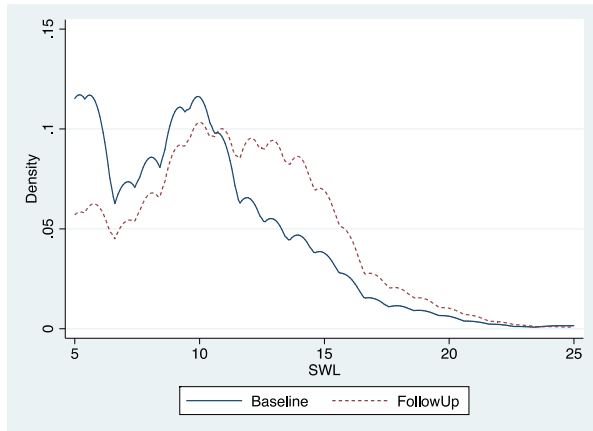
B. Log of Satisfaction with Life Score
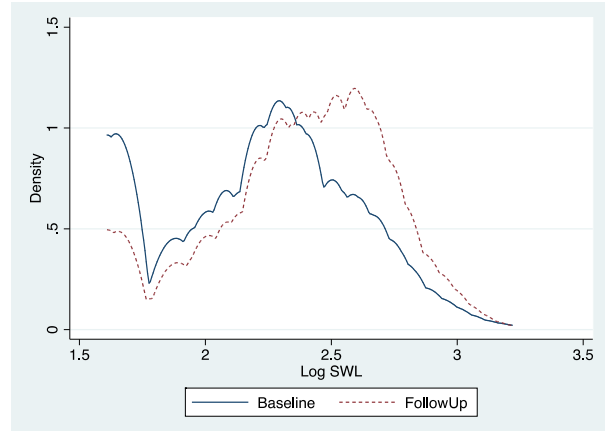
C. Log of Satisfaction of Life Score by Treatment and Comparison
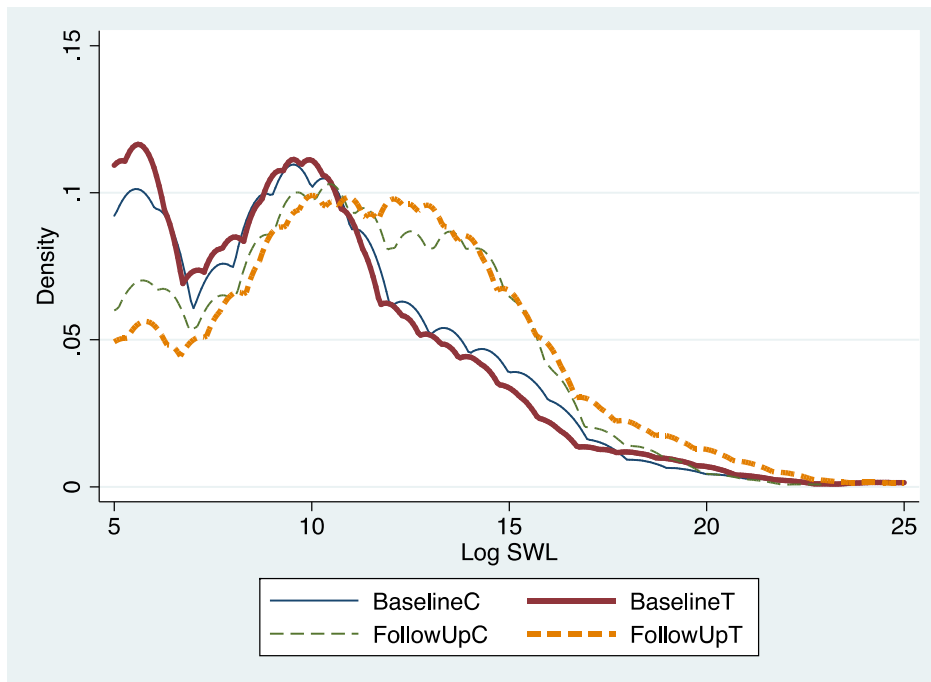
Figure 3.3b. Frequency Tabulation of Satisfaction with Life Scale Questions (as % of total)

Responses to Satisfaction with Life Scale Questions (in %)
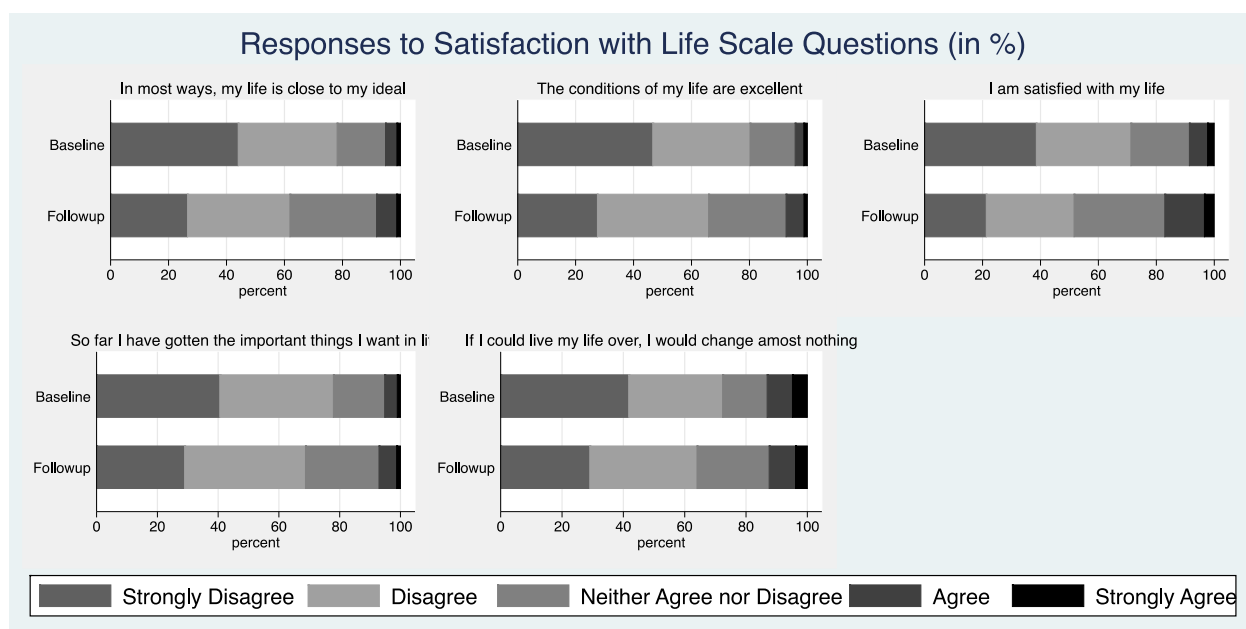
Means of the mediating variables we analyze in the paper are provided in Table 3.5b. Following standard practice in this field, we measure two dimensions of social capital by using the following questions in our survey:

1. Structural—We ask if anyone in the household has participated in the following eight organizations: church or mosque, women's livelihood group, marounds/mukaro, farmer group, business cooperative, labor union, youth association, and burial society. We code participation as a binary indicator if someone has participated in any of these organizations and construct another indicator to indicate if they have made any monetary contributions to the organization.

2. Cognitive—To measure trust, we use responses to the following statement: It is easy for me to borrow salt from my neighbors. Our national partners suggested this question as a good measure of trust in the local context. We code responses on the

five-point Likert scale as a binary variable indicating individuals who had agreed or strongly agreed that they could borrow salt.

Food security is measured by the Household Food Insecurity Access Scale (HFIAS) score, which is a nine-item scale, with a reference period of the past four weeks where households are asked to rate their experience on a scale from 'Rarely' to 'Often,' generating a total score from 0 to 27. The psychometric properties of the scale have been tested to ensure that it provides a continuous measure of the degree of food insecurity of the household (Coates, Swindale & Bilinsky, 2007, p.18). A higher score indicates the household suffers from more food insecurity and is relatively worse off.

As can be seen in Table 3.5b, we find no statistical significant difference at baseline between the Treatment and Comparison groups for all mediators analyzed. We observe an improvement in all indicators from baseline to follow-up. HFIAS score is about 14 at baseline and decreases to about 10.5 for both groups, thus indicating a reduction in food insecurity at follow-up. Similar to life satisfaction, these households have on average experienced an improvement in their food security status. A vast majority of these households are members of social organizations such as church or farmers' clubs, and about 40-50 percent are making monetary contributions to these groups. The percent of households that trust their neighbors to borrow salt has also increased from baseline to follow-up.

Table 3.5b. Average Value of Mediators across Treatment and Comparison Groups

	Treatment Group		Comparison Group		p-value of baseline difference
	Baseline	Follow-up	Baseline	Follow-up	
Household Food Insecurity Score	14.03	10.54	13.87	10.66	0.75
At least one household member is member of any of eight listed organizations* (%)	84.09	78.40	84.62	77.27	0.81
Has made Contributions to Social Networks* (%)	39.77	49.62	40.68	40.38	0.80
Trusts neighbor to borrow salt (%)	40.85	54.89	40.41	53.44	0.89
N	1746	1748	881	882	

* These are Church or Mosque, Women's livelihood group, Marounds/mukaro, Farmer group, Business cooperative, Labor union, Youth association, and Burial society

Notes: Attrition-adjusted weighted means, *p*-values obtained by clustering at ward level

3.4.3. Determinants of life satisfaction

Based on economic theory, we should observe a curvilinear relationship between life satisfaction and income. There should be a strong positive relationship between the two at lower levels of income/wealth and a weaker relationship at higher levels of income. We use per capita expenditure of the household as a proxy for income. The relationship between the log of per capita expenditure and SWL shows the expected positive linear trend, and we indeed find a curvilinear relationship between per capita expenditure and Satisfaction with Life score (Figure 3.4). Until about USD50, life satisfaction score is increasing and the slope is steep, thereafter the slope flattens out, and then surprisingly it begins to fall around USD80. However, the majority of the households in our panel sample at baseline lie below the USD50 cutoff. Only about 15 percent have per capita household expenditure greater than USD50, and about five percent have per capita household expenditure greater more than USD80. Though there have been studies that have reported a negative correlation between average income and average life satisfaction (Helliwell, 2008) it is nevertheless surprising to see a hint of this negative relationship in such a poor setting. This suggests that there are factors other than income or expenditure, which play an important role in determining SWL and can indeed dominate the impact of rising income/expenditure, even when the absolute level of income is very low.

Figure 3.4. SWLS score and per capita expenditure of household at baseline (Panel Households only)
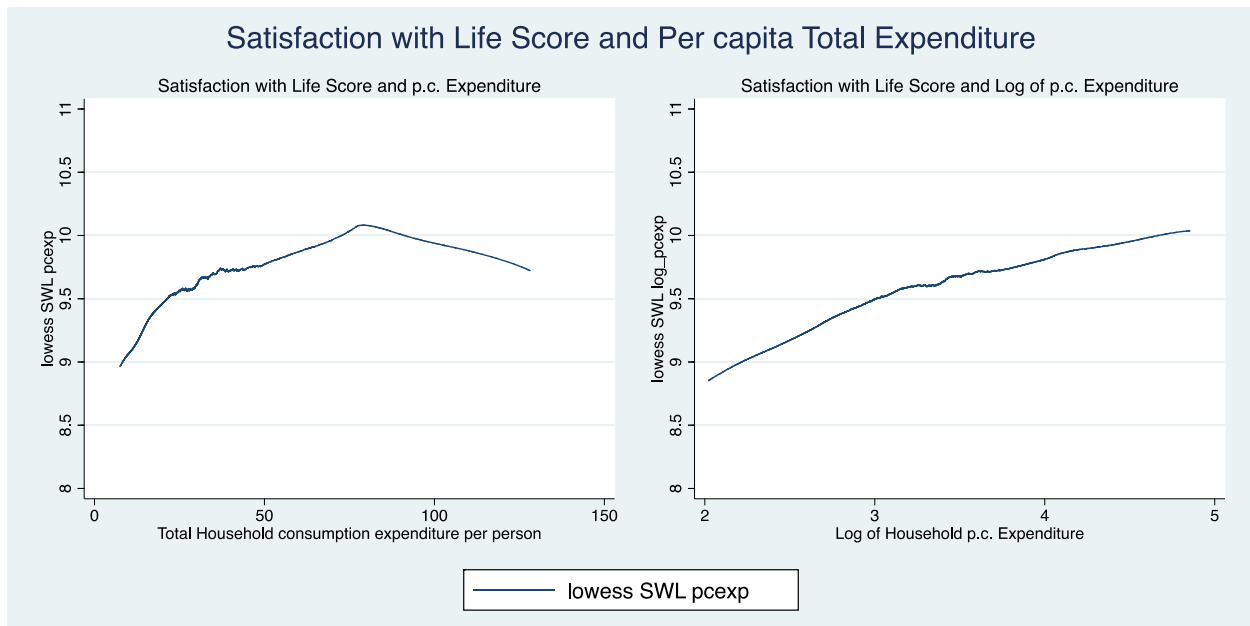
Note: per capita expenditure is restricted between 1st and 99th percentile

We therefore utilize Ordinary Least Squares (OLS) to estimate the association of other individual and household characteristics with SWLS score. The regressions use attrition-adjusted standardized weights and clustered robust standard errors at the ward level to account for clustering of households within wards. We use baseline data for this analysis and results are presented in Table 3.6. The first column controls for main respondent and household characteristics such as gender, age (in quadratic form), marital status, the logarithm of per capita household expenditure; the second column adds household food insecurity as an explanatory variable; and the third column adds variables that measure social capital.

In line with the literature on wellbeing, we find that being divorced or separated has a substantial and statistically significant negative effect on SWL score. It is associated with about eight to nine percent reduction in the SWLS score across all three models. Further, if the

respondent has attended school, their SWL score is predicted to increase by five to six percent. The occurrence of a death in the household is also consistently associated with a reduction in the SWLS score of the main respondent by about six to nine percent. Per capita expenditure is a poor predictor of SWL, once we control for household food insecurity. The impact of household food insecurity, as measured by the HFIAS, is in the expected direction, and statistically significant. Within social capital, the dimensions of trust and intensity of participation (as measured by any monetary contributions made to organizations) are positively significantly associated with satisfaction. However, simply being a member does not, in and of itself, seem to have an effect on satisfaction.

Table 3.6. Baseline Determinants of Satisfaction with Life (Log of SWLS Score)

	Model 1	Model 2	Model 3
Main Respondent Characteristics:			
Female	-0.009	-0.007	-0.019
	(0.022)	(0.022)	(0.022)
Age	0.006**	0.008***	0.008***
	(0.003)	(0.002)	(0.003)
Age Squared	-0.000**	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)
Widowed	-0.022	-0.013	-0.010
	(0.029)	(0.026)	(0.025)
Divorced/Separated	-0.092**	-0.088**	-0.081**
	(0.041)	(0.039)	(0.038)
Main resp. has schooling	0.064**	0.063***	0.053**
	(0.025)	(0.023)	(0.023)
Chronically ill	-0.032	-0.015	-0.010

	(0.021)	(0.021)	(0.021)
Household Characteristics			
Log of Household Size	0.116*	0.061	0.044
	(0.059)	(0.059)	(0.060)
Number of elderly	-0.010	-0.008	-0.008
	(0.020)	(0.020)	(0.020)
Number of children	-0.015	-0.009	-0.009
	(0.011)	(0.011)	(0.012)
# of livestock type	0.016***	0.010*	0.007
	(0.006)	(0.005)	(0.005)
Any income from wage labor? (Yes=1)	0.028	0.022	0.010
	(0.031)	(0.032)	(0.032)
Any income from maricho labor? (Yes=1)	-0.046*	-0.032	-0.027
	(0.025)	(0.023)	(0.022)
Per Capita Expenditure (Log usd)	0.047*	-0.001	-0.018
	(0.025)	(0.024)	(0.026)
# of shocks experienced	-0.023***	-0.013***	-0.013***
	(0.005)	(0.004)	(0.004)
Death in the household (Y = 1)	-0.092***	-0.073***	-0.060**
	(0.029)	(0.027)	(0.025)
Mediators:			
Log of Household Food Insecurity Score		-0.190***	-0.190***
		(0.018)	(0.018)
Member of any social network? (Yes=1)			-0.028
			(0.035)
Has made Contributions to Social Networks? (Yes=1)			0.074***

			(0.017)
Trusts neighbor to borrow salt			0.087***
			(0.024)
Other covariates:			
Mashona	0.110***	0.125***	0.130***
	(0.028)	(0.027)	(0.026)
Masvingo	0.047**	0.068***	0.081***
	(0.021)	(0.024)	(0.025)
Constant	1.709***	2.329***	2.382***
	(0.138)	(0.145)	(0.144)
Observations	2620	2620	2619
Adjusted R-squared	0.060	0.131	0.148

Notes: * p<0.10 ** p<0.05 *** p<0.01. Standard errors clustered at the ward level. Attrition-adjusted weighted results.

3.5. Specification

3.5.1. Total Impact of the HSCT Program

We utilize the panel sample of households to conduct a difference-in-differences (D-in-D) analysis to estimate the impact of the program on life satisfaction. Since the SWLS is only asked to the main respondent of the household, the unit of analysis for this model is the main respondent, and we control for both main respondent (individual) and household characteristics.

Equation (1):

$$Y_{hjt} = \beta_0 + \beta_1 Post_t + \beta_2 Transfer_j + \beta_3 (Transfer * Post)_{jt}$$
$$+ \beta_4 HHDemographics_h + \beta_5 HHMainResp_h + \beta_6 Strata_j + \beta_7 Prices_{jt}$$
$$+ \beta_8 Week_t + \varepsilon_{hjt}$$

where

Y_{hjt} is the score on Satisfaction with Life Scale (SWLS) measured in log scale for main respondent for household h in Ward j at time t;

$Post_t$ is an indicator that equals 1 if the time period is 2014 (12 month follow-up)

$Transfer_j$ is an indicator that equals 1 if the household is in a treatment Ward

HHDemographics refers to log of household size, and the number of people below 5, between 6-17, between 18-60, and those above 60

HHMainResp refers to the household's Main Respondent characteristics, which include indicators for if the household main respondent is female, widowed, divorced/separated, has attended school, currently attends school, and linear variables for the highest grade attained and age of the household main respondent

Strata are indicators of the strata used in selecting Wards. It includes two dummies to indicate if the household was located in Mashonaland East or Masvingo. The reference strata is Mtabeleland North.

$Prices_{jt}$ refer to a vector of cluster level prices of eight staple items.

$Week_t$ is the week in which the household is interviewed.

β_3 represents the impact estimator, or the effect of being a cash transfer beneficiary

We run ordinary least squares (OLS) regressions, clustering standard errors at the ward level. To increase statistical power (McKenzie, 2012), we control for baseline values for main respondent characteristics and household demographics except for prices, which we maintain as

exogenous and allow to vary by time period. The program has had no inflationary effect in treatment wards.

As described earlier, the study design is a ward level longitudinal matched design where households in both comparison and treatment districts went through official program targeting. Participation in the program is not demand-driven: the program eligibility identification process determines eligibility, and there were no refusals to participate in the program among eligible households, i.e., take up is universal among the eligible. Therefore, there is no self-selection into the treatment group.

The identifying assumption of the difference-in-differences model is of 'parallel trends', i.e., the trajectory of the dependent variable over the study time period would be the same across treatment and comparison wards in absence of the program. As described in the Study Design section, comparison wards were 'matched' to treatment wards by a scoring system based on five variables, which cover level of development and agro-ecological characteristics, to try to maintain the validity of this assumption. Trends in household consumption and production are expected to depend on these five indicators. In addition, baseline balance tests indicate that households across the treatment and comparison samples are balanced on a number of key demographic and socioeconomic characteristics (see Table 3.4). This is as expected since all households are eligible for the HSCT, having been selected according to the same program eligibility criteria. We do not have multiple pre-baseline data points to confirm parallel trends and must therefore maintain this as an identifying assumption. The fact that households themselves are balanced on key characteristics, and that comparison Wards are both

geographically adjacent and are matched on characteristics that would determine trends in

consumption, wellbeing and production suggest that this assumption is plausible.

The D-in-D model does not control for differences between the treatment and comparison

groups on account of household or individual unobserved characteristics. Our impact estimate

(β_3 in the above equation) may be biased if there are unobserved characteristics influencing both

the program and our outcome measure. A fixed effects model at the household level can address

the issue of unobserved characteristics that are fixed over time as a source for endogeneity. Note

though, that the threat unobservable characteristics impose to the validity of our model is

minimal because, as mentioned above, households in both arms are selected according to

program rules and take up is universal among the eligible, so there is no self-selection into the

treatment group. There is a second reason, however, why employing the fixed effects model is

warranted for estimating the impact on the SWL score. Subjective measures such as the SWL

scale can lead to responder bias since some element of their predisposition or attitudinal

characteristics will enter into the responses they give for the set of five questions that comprise

the SWL. If respondents interpret and answer these questions relative to their personal frame of

reference and this heterogeneity is correlated with other covariates, then our coefficient estimates

may be biased. It is, therefore, important to have panel data, where we follow the same

respondent from one year to the next to control for this type of responder bias. We estimate

Equation (2) using only the subsample of households where the main respondent has not changed

from baseline to follow-up. This is our preferred model:

Equation (2):

$$Y_{hjt} = \alpha_h + \beta_1 \text{Post}_t + \beta_2 \text{Transfer}_j * \text{Post}_t + \beta_3 \text{Prices}_{jt} + \beta_4 \text{Week}_t + \nu_{hjt}$$

where

Y$_{hjt}$ is log of the Satisfaction with Life score of the main respondent in household h in Ward j at time t

α$_h$ (h=1....H) is the intercept for each household (h household-specific intercepts)

Post, Prices, and Week are as described in Equation (1)

β$_2$ represents the impact estimate and v$_{hjt}$ is the time-varying error term

Standard errors are clustered at the ward level.

Out of the 2,630 households that comprise our panel sample, over 76 percent (2,007 households) has the same main respondent across the two time periods. Table B.2 of Appendix B shows the difference in household characteristics between households where the main respondent remained the same to those where it changed at follow-up. We find significant differences between the two groups. On average, household where the main respondent had changed tend to be larger, have lower per capita total expenditure, and belong to the male gender. However, baseline characteristics between treatment and comparison households in this 'same respondent' panel continue to be balanced (Appendix B Table B.3).

Together with the log of the Satisfaction with Life score, we run estimations on three other outcomes. First, we construct a binary variable that takes the value of one, if the main respondent's Satisfaction with Life score is greater than the average for the sample, and zero otherwise. The mean Satisfaction with Life score, across both treatment and comparison groups at baseline in our sample is about ten. We, therefore, use the value of 10 as a cutoff. This binary

variable acts as a threshold level and helps us understand what percentage of the beneficiaries experience a jump across the baseline mean score of 10. We also utilize two other questions from the survey which asked the respondent to rate "I feel positive about the future" and "I feel happy most of the time" to create two subjective wellbeing indicators. We code responses on the five-point Likert scale as a binary variable indicating individuals who had agreed or strongly agreed with these affirmative statements. These additional questions address different but related domains of the subjective wellbeing construct. Conceptually, movement along these indicators should be in the direction as that of satisfaction with life.

3.5.2 Mediation of the Total Impact

Any impact of the cash transfer on overall life satisfaction of beneficiaries will be mediated through how people spend that income. As mentioned earlier, we are interested in analyzing if the impact is mediated through satisfaction of basic needs as indicated by food insecurity, and through satisfaction of higher-order needs as indicated by an increase in social participation. Availability of cash allows people to make the necessary monetary contributions to institutions such as the church, and even offer assistance to other households. This increased ability to participate in community social life and social networks, increases their social inclusion.

To analyze mediation of the cash transfer impact through these pathways we utilize the Barron-Kenny approach (Barron & Kenny, 1986), which is a linear structural equation model that estimates causal mediation effects. It decomposes the total treatment effect into indirect and direct effects, where the indirect effect provides one explanation of why the treatment works

(through the mediator that is being analyzed), and the direct effect represents all other channels. However, Keele et al (2015) highlight that estimates generated by this model can be interpreted as consistent estimates only under the assumption[25] of sequential ignorability, i.e., first, we have to assume that the treatment assignment is statistically independent of both the outcome and the mediator, and second, to estimate the impact of the mediator as a pathway, we have to assume that the mediator itself, is also statistically independent of the outcome. The task here is to identify how variation in the mediation variable, induced only by the treatment, and not due to any other confounder that also impacts the outcome, is impacting variation in the outcome. The first assumption of randomized treatment assignment is satisfied since the present study is designed to mimic a randomized experiment. However, the second assumption requires randomized mediator assignment as well. Since we cannot accomplish that experimentally, Keele et al suggest that we control for possible pre-treatment confounders that affect both the mediator and the outcome (*Z*). We, therefore, further augment the Barron-Kenny model by controlling for the set of Z, pre-treatment confounders which impact both Life Satisfaction and the mediators. The model below conceptualizes the relationship.

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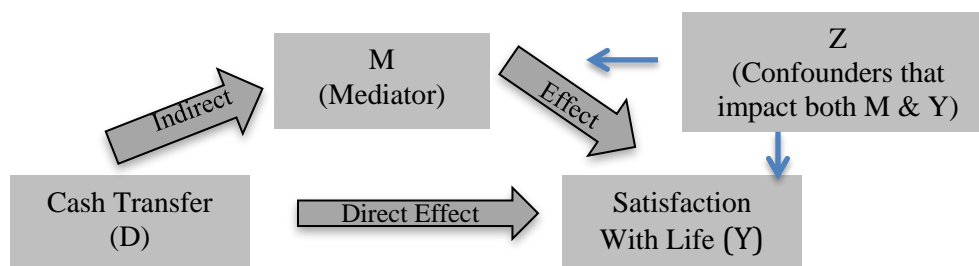
[25] The linear structural equation model also requires two other assumptions to hold apart from sequential ignorability: the 'no-interaction assumption', i.e. the direct and indirect effect should not vary as a function of the treatment status, and the functional form of the expected value of the mediator and the outcome is linear and additive.

The estimation equations are as follows:

Reduced Form Model to estimate the Total Effect of the cash transfer:

Equation (3)

$$Y_{hjt} = \beta_0 + \beta_1 Post_t + \beta_2 Transfer_j + \beta_3 (Transfer * Post)_{jt} + \beta_4 X_h + \beta_5 Z_h + u^1_{hjt}$$

where X is the set of confounding variables (main respondent and household

characteristics) outlined in Equation (1) above and Z is a set of confounding variables

that impact both the mediators and Life Satisfaction. Based on the baseline determinants

of life satisfaction analyses, we include the following variables in this set: household per

capita monthly expenditure, dummy variables to indicate whether the household gets

wages from wage labor and/or casual (maricho) labor, a variable that counts the number

of different types of livestock the household, a variable that counts the number of

different types of shocks the household has been exposed to such as death of family

member, droughts, floods, etc., and a dummy variable that specifically accounts for a

death in the household in the last 12 months.

Structural Form Model to estimate the Direct Effect and Indirect Effect of the cash transfer:

Equation (4):

$$Y_{hjt} = Y_0 + Y_1 Post_t + Y_2 Transfer_j + Y_3 Transfer * Post_{jt} + Y_4 X_h + Y_5 Z_h + Y_6 Mediator_{ht}$$
$$+ u^2_{hjt}$$

Equation (5):

$$Mediator_{hjt} = \alpha_0 + \alpha_1 Post_t + \alpha_2 Transfer_j + \alpha_3 Transfer * Post_{jt} + \alpha_4 X_h + \alpha_5 Z_h + u^3_{hjt}$$

The total effect of the cash transfer (β_3) is composed of:

1. Direct Effect - Partial impact of the cash transfer (γ_3) controlling for the mediator M

2. Indirect Effect - Partial impact of the cash transfer on the mediator (α_3) multiplied by the partial impact of the mediator on Y, controlling for the cash transfer (γ_6)

i.e., $\beta_3 = \gamma_3 + \alpha_3 * \gamma_6$

If γ_3 is substantially less than β_3, or in the extreme if it is equal to zero, then we know that most of the impact of the cash transfer is through the mediator, i.e. there is 100 percent mediation.

3.6. Results and Discussion

3.6.1. Total Impact Results

Table 3.7 provides the results of the difference-in-differences (D-in-D) analysis to estimate the impact of the program on life satisfaction. It shows the average Intention To Treat (ITT) impact of the cash transfer. The SWL score increases by 14.2 percent for the full panel sample. The impact is similar if we stratify households based on transfer value per person as a share of their per capita expenditure. We choose 20 percent as a cutoff because experience from the Transfer Project indicates that impacts are substantially smaller and more inconsistent when the transfer is less than 20 percent of pre-program consumption (Davis & Handa, 2015). However, in the case of SWL score, transfer share does not seem to matter, as the impact estimate stays around 14 percent for both categories. To check for differences across sub-groups

of households, we stratify our sample based on the gender of the main respondent. Interestingly, we find that male main respondents experienced a greater impact, 16 percent, on their SWL score compared to female main respondents where the estimate is relatively lower at 13 percent.

The same pattern is true if we use the SWL score dummy variable. The proportion of households, whose SWL score jumps across the baseline mean of 10, increases by 16 percentage points (pp). The impact is similar across households receiving transfers greater than or less than 20 percent of their pre-program consumption expenditure. The impacts are also much larger for male main respondents (23 pp), when compared to female (12 pp). The proportion of households where the main respondent 'agreed' or 'strongly agreed' about feeling positive for the future, increase by about 10 pp in the full panel sample and by 16 pp for households with male main respondents. The impact estimate of the 'Feel Happy' indicator is only significant when we use the full panel sample and for households where the transfer is less than 20 percent of expenditure.

To control for attitudinal bias in the SWL score, we restricted the sample to only those households where the main respondent had not changed from 2013 to 2014 and run an individual fixed effects model, which controls for personality traits and other unobserved idiosyncrasies of the individual that are fixed over the one-year time period. Results are provided in Table 3.8. This model yields a significant 17.3 percent increase in the SWL score; the number of respondents who can be categorized as 'satisfied' by using the binary variable increase by 19.4 pp; a 12.4 pp increase in respondents who 'feel positive', and a 11.6 pp increase in respondents who 'feel happy.'

Table 3.7. Impact Estimates of the Cash Transfer on Life Satisfaction and Other Subjective Wellbeing Indicators: Difference-in-Differences Pooled Cross-section Model

	Using Full Panel Sample		Households where transfer is >= 20% of p.c. total exp.		Households where transfer is <20% of p.c. total exp.		Households with Female Respondent		Households with Male Respondent	
	DinD	N	DinD	N	DinD	N	DinD	N	DinD	N
Log SWL	0.142***	5255	0.141***	2753	0.144***	2502	0.129***	3592	0.160***	1663
	(0.031)		(0.043)		(0.038)		(0.042)		(0.044)	
SWL Dummy	0.162***	5260	0.161***	2754	0.159***	2506	0.121**	3596	0.232***	1664
	(0.034)		(0.050)		(0.044)		(0.056)		(0.055)	
Feel Positive	0.096***	5254	0.091**	2752	0.102**	2502	0.058	3590	0.164***	1664
	(0.031)		(0.043)		(0.041)		(0.037)		(0.043)	
Feel Happy	0.082*	5253	0.016	2753	0.147***	2500	0.092	3592	0.064	1661
	(0.047)		(0.078)		(0.051)		(0.058)		(0.069)	

Notes: * p<0.10 **p<0.05 ***p<0.01. Standard errors clustered at the Ward level in parentheses.
Attrition adjusted weighted results. Estimations use difference-in-difference modeling among panel households. All estimations control for baseline household size and demographic composition, main respondent's gender, age, education and marital status, week of interview, strata, and a vector of cluster level prices.

Table 3.8. Impact Estimates of the Cash Transfer on Life Satisfaction and Other Subjective Wellbeing Indicators: Individual Fixed Effects Model

	All Household FE		Individuals from hhlds where transfer is >= 20% of p.c. total exp.		Individuals from hhlds where transfer is < 20% of p.c. total exp.		Females		Males	
	DinD	N	DinD	N	DinD	N	DinD	N	DinD	N
Log SWL	0.173***	4010	0.165***	2135	0.189***	1875	0.162***	2930	0.193***	1080
	(0.040)		(0.049)		(0.049)		(0.046)		(0.054)	
SWL Dummy	0.194***	4014	0.218***	2136	0.174***	1878	0.163***	2934	0.257***	1080
	(0.047)		(0.054)		(0.063)		(0.052)		(0.074)	
Feel Positive	0.124***	4008	0.125**	2134	0.127***	1874	0.105***	2928	0.172***	1080
	(0.032)		(0.052)		(0.038)		(0.038)		(0.044)	
Feel Happy	0.117**	4009	0.057	2135	0.184***	1874	0.110	2930	0.129	1079
	(0.056)		(0.084)		(0.063)		(0.071)		(0.083)	

Notes: * p<0.10   **p<0.05   ***p<0.01. Standard errors clustered at the Ward level in parentheses.
Attrition adjusted weighted results. Estimations control for week of interview and a vector of cluster level prices.

3.6.2. Mediation Results

Tables 3.9 – 3.13 present results from the estimation equations (3), (4), and (5), outlined in the Empirical Approach section. We compare the coefficient of the D-in-D indicator in Model (1) with that of Model (2) to assess if the program impact has attenuated when accounting for the mediator. While the total effect of the program on SWLS is to increase it by 14 percent, we find that the direct effect, after controlling for mediator, HFIAS score, is reduced somewhat to 11.5 percent. The product of two coefficients provides the indirect effect: the D-in-D coefficient in Model 4, multiplied with the HFIAS coefficient in Model 2. We find that food insecurity is mediating about 16 percent of the total impact of the cash transfer on life satisfaction (Table 3.9).

In addition to controlling for 'Z' confounders, Keele et al (2015) suggest that controlling for pre-treatment values of the mediator are another useful way to account for sequential ignorability. Therefore, we add the pre-treatment mediator value as an additional control in Model (3) and (5), and find that this does not change our results.

We then extend the analysis to explore social capital as a potential pathway. These results are provided in Table 3.10 and Table 3.11. Contributions mediate the impact by only about 5 percent (as calculated from Model 2 and 4 in Table 3.10) and trust does not mediate any impact (as calculated from Model 2 and 4 in Table 3.11). Again, controlling for pre-treatment mediator values does not change our results.

Table 3.9. Impact Estimates of HSCT on Satisfaction With Life Score Mediated through Food Insecurity

	(1) log_swl	(2) log_swl Direct Effect	(3) log_swl Direct Effect	(4) log_hfias Indirect Effect	(5) log_hfias Indirect Effect
DinD Indicator	0.138***	0.115***	0.115***	-0.117**	-0.112**
	(0.032)	(0.029)	(0.028)	(0.053)	(0.052)
Log Baseline p.c. expenditure	0.086***	0.048**	0.049**	-0.205***	-0.049**
	(0.020)	(0.019)	(0.019)	(0.036)	(0.022)
Log Household Food Insecurity Score		-0.187***	-0.190***		
		(0.011)	(0.012)		
Log of Household Food Insecurity Score (Baseline Value)			0.006		0.564***
			(0.014)		(0.015)
Percent of CT impact mediated in Col (1) **explained by mediator**				**15.9%**	**15.4%**
N	5255	5255	5255	5260	5260
adj. R-sq	0.103	0.183	0.183	0.121	0.358

Notes: * p<0.10   **p<0.05   ***p<0.01. Standard errors clustered at the Ward level in parentheses.

Attrition adjusted weighted results. Estimations use difference-in-difference modeling among panel households. All estimations control for baseline household size and demographic composition, main respondent's gender, age, education and marital status, week of interview, strata, and a vector of cluster level prices.. We also control for baseline values of 'Z' confounders: per capita expenditure, # of livestock type, if household receives wage income or maricho income, number of shocks experienced, and death of a household member.

Table 3.10. Impact Estimates of HSCT on Satisfaction With Life Score Mediated through Contributions

	(1) log_swl	(2) log_swl	(3) log_swl	(4) any_contrb	(5) any_contrb
		Direct Effect	Direct Effect	Indirect Effect	Indirect Effect
DinD Indicator	0.138***	0.131***	0.131***	0.066*	0.090**
	(0.032)	(0.031)	(0.031)	(0.039)	(0.037)
Log Baseline p.c. expenditure	0.086***	0.074***	0.074***	0.124***	0.014
	(0.020)	(0.021)	(0.021)	(0.022)	(0.011)
Has made Contributions to Social Networks		0.100***	0.102***		
		(0.016)	(0.018)		
Has made Contributions to Social Networks (baseline value)			-0.004		0.610***
			(0.016)		(0.011)
Percent of CT impact mediated in Col (1) explained by mediator				**4.8%**	**6.7%**
N	5255	5255	5255	5260	5260
adj. R-sq	0.103	0.116	0.116	0.108	0.426

Notes: * p<0.10 **p<0.05 ***p<0.01. Standard errors clustered at the Ward level in parentheses.
Attrition adjusted weighted results. Estimations use difference-in-difference modeling among panel households. All estimations control for baseline household size and demographic composition, main respondent's gender, age, education and marital status, week of interview, strata, and a vector of cluster level prices.. We also control for baseline values of 'Z' confounders: per capita expenditure, # of livestock type, if household receives wage income or maricho income, number of shocks experienced, and death of a household member.

Table 3.11. Impact Estimates of HSCT on Satisfaction With Life Score Mediated through Trust

	(1) log_swl	(2) log_swl	(3) log_swl	(4) trust_salt	(5) trust_salt
		Direct Effect	Direct Effect	Indirect Effect	Indirect Effect
DinD Indicator	0.138***	0.136***	0.135***	0.021	0.033
	(0.032)	(0.031)	(0.031)	(0.044)	(0.044)
Log Baseline p.c. expenditure	0.086***	0.085***	0.082***	0.028	-0.010
	(0.020)	(0.020)	(0.020)	(0.026)	(0.016)
Trusts neighbor to borrow salt		0.062***	0.049***		
		(0.015)	(0.016)		
Trusts neighbor to borrow salt (baseline value)				0.027	0.514***
				(0.019)	(0.012)
Percent of CT impact mediated in Col (1) explained by mediator				**0.9%**	**1.2%**
N	5255	5254	5251	5257	5254
adj. R-sq	0.103	0.108	0.109	0.039	0.286

Notes: * p<0.10   **p<0.05   ***p<0.01. Standard errors clustered at the Ward level in parentheses.

Attrition adjusted weighted results. Estimations use difference-in-difference modeling among panel households. All estimations control for baseline household size and demographic composition, main respondent's gender, age, education and marital status, week of interview, strata, and a vector of cluster level prices.. We also control for baseline values of 'Z' confounders: per capita expenditure, # of livestock type, if household receives wage income or maricho income, number of shocks experienced, and death of a household member.

In addition to a difference-in-differences model, we use the fixed effects model to analyze mediation. Results are provided in Table 3.12. We find that food security mediation rises marginally from the previous model to 16.5 percent, and mediation by social capital declines to 3.5 percent. Trust does not mediate any impact in this model as well.

To further explore the role of mediators, we conducted a subsample analysis as shown in Table 3.13. While food insecurity is mediating 20 to 25 percent of the total impact on SWL score for households where the main respondent remains the same and for female main respondents, it plays a negligible role in mediating the impact on male respondents. Contributions made to social networks and trust are negligible mediators in the case of these subsamples too.

In summary, the quantitative analyses show that that the HSCT Program has improved the beneficiaries' judgment of their overall life satisfaction. If we consider our individual fixed effects results, which is our most robust model since it controls for attitudinal bias, the total impact of the transfer on the Satisfaction of Life score is 17 percent; proportion of respondents that cross the SWL baseline mean score of ten increase by 19 percentage points; and the proportion of respondents that 'feel positive' or who 'feel happy' increase by about 12 pp. Our mediation analysis informs us that lowered food insecurity has a 16 percent average causal mediation effect. However, contributions made to social networks and trust, are not substantively mediating an increase in life satisfaction in this particular context.

Table 3.12. Mediation Estimates: Fixed Effects

Food Security	(1) log_swl	(2) log_swl Direct Effect	(3) log_hfias Indirect Effect
DinD Indicator	0.159***	0.133***	-0.136**
	(0.035)	(0.030)	(0.057)
Log Household Food Insecurity Score		-0.193***	
		(0.014)	
Percent of CT impact mediated in Col (1) explained by mediator			**16.5%**
N	5255	5255	5260
adj. R-sq	0.132	0.215	0.131

Contributions to Social Networks	log_swl	log_swl Direct Effect	any_contrb Indirect Effect
DinD Indicator	0.159***	0.154***	0.079**
	(0.035)	(0.034)	(0.039)
Has made Contributions to Social Networks		0.069***	
		(0.021)	
Percent of CT impact mediated in Col (1) explained by mediator			**3.4%**
N	5255	5255	5260
adj. R-sq	0.132	0.137	0.024

Trust	log_swl	log_swl Direct Effect	trust_salt Indirect Effect
DinD Indicator	0.159***	0.154***	0.079**
	-0.035	-0.034	-0.039
Trusts neighbor to borrow salt		0.069***	
		-0.021	

Percent of CT impact mediated in Col (1)
explained by mediator   **1.2%**

N	5255	5254	5257
adj. R-sq	0.132	0.135	0.069

Notes: * p<0.10 **p<0.05 ***p<0.01. Standard errors clustered at the Ward level in parentheses. Attrition adjusted weighted results. Estimations control for week of interview and a vector of cluster level prices.

Table 3.13. Impact Estimates of HSCT on Satisfaction With Life Score: Mediation Subsample Analyses

	N	Total Effect (1)	Direct Effect Including the following as control:			Indirect Effect					
			Food Insecurity	Contributions	Trust	Food Insecurity		Contributions		Trust	
		Υ	Υ_3	Υ_3	Υ_3	Υ_6	α_3	Υ_6	α_3	Υ_6	α_3
Same Main Resp.	4010	0.160*** (0.037)	0.127*** (0.033)	0.153*** (0.037)	0.158*** (0.037)	-0.200*** (0.014)	-0.160** (0.067)	0.107*** (0.016)	0.066 (0.040)	0.079*** (0.015)	0.013 (0.050)
Percent of CT impact mediated in Col (1) explained by mediator						**20.0%**		**4.4%**		**0.6%**	
Female Main Resp.	3592	0.126*** (0.043)	0.094** (0.039)	0.119*** (0.042)	0.123*** (0.042)	-0.197*** (0.015)	-0.162** (0.063)	0.105*** (0.019)	0.073 (0.046)	0.066*** (0.020)	0.044 (0.053)
Percent of CT impact mediated in Col (1) explained by mediator						**25.3%**		**6.1%**		**2.3%**	
Male Main Resp.	1663	0.153*** (0.044)	0.147*** (0.042)	0.149*** (0.042)	0.154*** (0.043)	-0.165*** (0.021)	-0.040 (0.070)	0.083*** (0.021)	0.050 (0.064)	0.058** (0.023)	-0.019 (0.067)
Percent of CT impact mediated in Col (1) explained by mediator						**4.3%**		**2.7%**		**-0.7%**	

Notes: * p<0.10 **p<0.05 ***p<0.01. Standard errors clustered at the Ward level in parentheses.
Attrition adjusted weighted results. Estimations use difference-in-difference modeling among panel households. All estimations control for baseline household size and demographic composition, main respondent's gender, age, education and marital status, week of interview, strata, and a vector of cluster level prices.. We also control for baseline values of 'Z' confounders: per capita expenditure, # of livestock type, if household receives wage income or maricho income, number of shocks experienced, and death of a household member.

3.6.3. Qualitative Data

To better understand some of these results, we also utilized qualitative data that was collected at follow-up in the treatment districts as part of the impact evaluation. The qualitative data is comprised of in-depth interviews (IDI) with eight caregivers and nine youths in beneficiary households, 18 semi-structured interviews with government officials in different ministries, and 18 focus group discussions with six to eight key community members that include community leaders such as the chief or village head and others who have knowledge of the local community such as school teachers and women's groups leaders. For details on methodology, please refer to AIR (2015). Three common themes that are pertinent to this paper emerged across all interviews and discussions. First, beneficiaries and others noted that the cash was useful in putting food on the table and meeting basic needs such as soap and blankets. They also mentioned spending the cash on livestock (mainly goats and chickens) and upgrading their dwelling units (such as corrugated roofs and cementing the floor). As one youth, aged 16 years, in Binga reported:

> *I know about the programme and that my family receives the money…I do not know who takes charge of how we use the money between my Aunt and Uncle. All I know is that they buy groceries for the family, things like sugar and mealie-meal…Since we started receiving the money, the family has been able to buy bathing and washing soap besides food.*

Similarly, a caregiver in Mwenezi commented:

> *I am paying school fees, buying food and we are planning with other beneficiaries to do mukando so that we can serve and buy something big at the like goats. At the moment I haven't yet bought any livestock because of school fees and food….I think these transfers are very much helpful in our lives because a lot has changed for the better like having toiletries, school shoes and mainly food is now on our tables.*

Payment of school fees (and accompanying expenditure on uniforms and stationary) is the second recurrent theme to emerge. Being able to send their children to school is important for

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caregivers in these communities as this was repeatedly brought up. They were using the cash and the knowledge that there would be a future stream of cash income for either clearing a backlog of unpaid school fees, paying current term fees, and/or negotiating paying part of the fees. This is in line with findings from a qualitative study conducted by Oxford Policy Management (OPM) in October 2012 in two districts, Chivi and Goromonzi, which were among the pilot districts of the HSCT Program (Attah et al, 2016). Below are a few comments from in-depth interviews with beneficiaries, both caregivers and youths:

> *I have knowledge on how these transfers are managed because my mother is a beneficiary and she is the one who make all the decisions on how this money is used. My mother bought a goat from her savings and I really appreciate because since we started receiving these transfers my mother bought me books and at times paid for my school fees and there is a big change on our daily food stuffs. (*Youth aged 18 years in Binga)

> *I hope these children will grow up and be people who can be responsible for themselves and never be beggars and this can be achieved through education….The cash transfer has made a very big difference because all my children are now up to date in their school fees payment and they are going to school in complete school uniforms*. (Caregiver in Mwenezi)

Are these findings reflected in the quantitative data? Did the cash transfer indeed lead to an increase in education expenditure and did that in turn lead to greater life satisfaction? Results are provided in Table 3.14. We only included those households who had school going children in this sample. We find that indeed, the impact estimate on education related purchase is statistically significant. The cash transfer has increased expenditure purchases by about 35 percent (Column 4). However, it is mediating the impact on life satisfaction by only about three to five percent.

Table 3.14. Impact Estimates of HSCT on Satisfaction With Life Score Mediated through Education Expenses

	(1)	(2)	(3)	(4)	(5)
	log_swl	log_swl Direct Effect	log_swl Direct Effect	LD_exp_educ_purchases Indirect Effect	LD_exp_educ_purchases Indirect Effect
DinD Indicator	0.160***	0.154***	0.151***	0.350***	0.366***
	(0.038)	(0.038)	(0.037)	(0.074)	(0.068)
Log Baseline p.c. expenditure	0.081***	0.073***	0.077***	0.489***	0.081***
	(0.021)	(0.023)	(0.024)	(0.058)	(0.026)
Log hhld educational purchases		0.016	0.022*		
		(0.012)	(0.013)		
Log hhld educational purchases (baseline)			-0.010		0.638***
			(0.010)		(0.013)
Percent of CT impact mediated in Col (1) explained by mediator				**3.5%**	**5.0%**
N	3948	3948	3948	3951	3951
adj. R-sq	0.089	0.090	0.090	0.197	0.529

Notes: * p<0.10   **p<0.05   ***p<0.01. Standard errors clustered at the Ward level in parentheses.
Attrition adjusted weighted results. Estimations use difference-in-difference modeling among panel households. All estimations control for baseline household size and demographic composition, main respondent's gender, age, education and marital status, week of interview, strata, and a vector of cluster level prices.. We also control for baseline values of 'Z' confounders: per capita expenditure, # of livestock type, if household receives wage income or maricho income, number of shocks experienced, and death of a household member.

Lastly, the qualitative data tells us that the impact of the cash transfer on social capital was mixed. The cash was increasing social participation by enabling beneficiaries to join informal group savings and investment clubs, locally known as 'mukando' or 'maround', or farmers clubs which enable sharing of agricultural tools and implements and burial societies. Beneficiaries were also able to engage in reciprocity with their relatives. However, it was also leading to tension within the community between beneficiaries and non-beneficiaries. This explains why we do not see any impact of the cash transfer on our 'trust' indicator, and therefore also the fact that trust was not found to be a mediating factor for increasing satisfaction with life. This finding was also reported in the qualitative study conducted by OPM in October 2012 (OPM, 2013). In addition, in our interviews with them, HSCT beneficiaries reported that they were proactively being excluded from other government and non-government aid programs. As one key informant put it, "*The Mudzi community has rejected the harmonisation i.e having an individual receiving from more than one programme as such at least everyone should benefit from one of the programmes*". The comments below testify to this mixed experience:

> *The cash from Social Welfare has improved my family well-being and my relations with my relatives have improved since I am now in a position to borrow them cash when they need it.* (Caregiver in Binga)

> *However, my relationship with some villagers has gone sour mainly because they feel I should not have benefited from the HSCT programme because I am still young and therefore able to work for my family. I feel I am now discriminated from benefiting from other programmes such as food for work through Save the children. Some villagers no longer want to assist those who benefited from the programme because they feel that they are now better off than the non beneficiaries.* (Caregiver in Binga)

> *There is a great change in my relationship with the family because if you receive your transfer and you bring sugar to your family they become happy and also when relatives visit they can now drink tea and they feel important whenever they receive such a welcome from someone who didn't manage to feed a visitor before.* (Caregiver in Mwenezi)

This has changed my relationship because now they understand my problems than before and now I can manage to borrow from others without any fear knowing that I will pay back when we receive other transfers. (Caregiver in Mwenezi)

The impact of the cash transfer on social participation is therefore complex, and while it can enable beneficiaries to be active participants in their community, it can also lead to tension between beneficiaries and non-beneficiaries.

3.7. Conclusion

This paper is based on the premise that an important component of wellbeing is the individual's self-perception of how well they are doing. We focus on one component of subjective wellbeing, Satisfaction With Life. We aim to understand if the Harmonized Cash Transfer Program in Zimbabwe succeeds in improving the beneficiaries' judgment of their overall life satisfaction. We find that total impact of the transfer on the Satisfaction of Life score is in the range of 14 to 17 percent. The point estimate at the higher end of that range is obtained from our most robust model, the individual fixed effects model.

There is heterogeneity of impact across subsamples. Specifically, the impact on male main respondents is higher, between 16 to 20 percent, as compared to female respondents, which is around 13-16 percent. This finding is consistent with a long tradition of studies finding large and consistent gender gap in self-reported health measures (Nathanson, 1975). Explanations for this gap have varied from 'true' health differences (Case and Paxson, 2005; Malmusi et al., 2012), to socio-economic variables that impose more social obligations on women and lower perceived control and self-esteem (Denton et al, 2004), to systematically different gender thresholds (Lindeboom and van Doorslaer, 2004; Peracchi and Rossetti, 2008), and more

recently to different individual discount rates (Soytas and Kose, 2014) Further work needs to be conducted to understand what is driving these differences across genders in the case of life-satisfaction specifically.

To understand what is driving the treatment effect, we decompose the total effect of 14 percent into direct and indirect effects. The indirect effects explore specific potential explanations for why the treatment is working. In this paper, we chose to analyze two specific mediators through which the additional cash income might be influencing life satisfaction: through satisfaction of basic needs as indicated by decreased food insecurity, and through satisfaction of a higher level need as indicated by increase in social participation or 'social capital'. We hypothesized that even at low-income levels, money may be used to satisfy not just basic physiological needs but also higher-level needs such as social participation, which improves the person's SWB. Our mediation analyses uncovered an average causal mediation effect of about 16 percent through lowered food insecurity and only 5 percent through an increase in occurrence of contributions made to social networks. Trust was not found to be mediating factor in increasing life satisfaction in this particular context. Our findings from the qualitative data further corroborate that the impact of the cash transfer on social participation is complex and while it can enable beneficiaries to be active participants in their community, it can also lead to tension between beneficiaries and non-beneficiaries. Further research is required to tease apart the impact of the cash transfer on inter-household dynamics and at the community level.

Despite the challenges of measuring subjective wellbeing, there is now an increased focus on explicitly including it as part of program evaluations. It is important in and of itself, and can provide a positive reinforcement of improvements obtained in traditional program evaluation measures, such as improved educational outcomes and economic decision-making. Further, by identifying pathways through which subjective wellbeing is affected by the cash transfer, policy makers can use that knowledge to better design and implement social protection programs. This paper has demonstrated that even in the short period of a year, the HSCT has had a positive impact on the beneficiary's perception of satisfaction with life. While some of that improvement can be attributed towards fulfillment of basic needs such as food security, it is not clear if increased social engagement has contributed to that improvement.

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CHAPTER 4: DO GOVERNMENT CASH TRANSFERS CROWD OUT INFORMAL INTER-HOUSEHOLD TRANSFERS?

4.1. Introduction & Background

The standard framework used to analyze the relationship between private inter-household transfers and a public transfer is that of altruism (borrowing from the intra-household transfer model of Becker, 1974) versus exchange (Bernheim et al. 1985). If the private transfers are motivated by altruism, then it follows that there exists a negative relationship between public and private transfers. This is because the household that is making the transfer will infer that the recipient household's welfare has been partly taken care of due to the public transfer. If however, the primary motivation is exchange, then the relationship is less straightforward. In such a model, the donor makes cash/in-kind payments in lieu of certain expected services (for example, child care). Public transfers will raise the implicit price of these services, and private transfers could fall/rise depending on price elasticity of these services. Attanasio and Rios-Rull (2000) and Strobbe and Miller (2011) highlight a third reason, that of risk sharing practices, wherein households use private transfers to share idiosyncratic risk. There exists a substantial body of literature on the empirical analysis of the crowding-out effect of public transfers/insurance (this includes programs such as Medicaid, AFDC, and old age pensions) on private transfers.

The application of this theoretical literature to cash transfer programs in developing countries has provided mixed evidence. Some of the early empirical analyses in this area focuses

on the Progresa program in Mexico. While Teruel and Davis (2000) reject the crowding-out effect for Progresa on private monetary transfers, Albarran and Attanasio (2001) find a significant impact on both the incidence and size of private transfers. Angelucci et al (2006) analyzed the impact of the cash transfer in urban Mexico on loans and in-kind transfers and found that treated households are both, 10 percentage points less likely to receive an in-kind transfer, and observed lower loans for the treated group. As such, there is no clearly identified pattern of crowding-out effects for the Progresa program at least.

A more recent study by Nielsen and Olinto (2007) uses the difference-in-difference model to estimate the impact of conditional cash transfers in Nicaragua and Honduras on three kinds of private transfers: remittances, food transfers, and food/money donations from NGOs. They find no effect on remittances in either country but an impact on food transfers in Nicaragua. This is similar to the finding by Teruel and Davis (2000). Strobbe and Miller (2011) estimate the crowding effect on three types of private transfers – gifts, remittances, and informal loans. They find that the government cash transfer in Malawi leads to crowding-out for gifts and remittances but not for informal loans. Thus, existing empirical literature indicates that cash transfer programs impact transfers/gifts received from different sources differently. Crowding-out may occur for certain types of transfers, for example, in-kind transfers of food that are given by a geographically proximate support network. However, remittances by migrant household members might not be impacted by the transfer, at least in the short term.

In this paper, we analyze this question utilizing longitudinal data collected for the evaluation of the Harmonized Social Cash Transfer (HSCT) Programme, a government-run

unconditional cash transfer program in Zimbabwe. The HSCT is an unconditional cash transfer program targeted to ultra-poor households who are food poor and labor constrained. Payments to beneficiaries have occurred regularly on a bi-annual basis. The data we have permits us to analyze impacts on aggregate measure of gifts received in cash and kind from family, friends or neighbors. This includes remittances, but we do not have information to parse out remittances from the aggregate measure that combines gifts and remittances. In addition, we analyze impacts of the transfer on the household's ability to make contributions to social networks or to take out a loan.

We find that, on aggregate, there is no evidence of crowding out of inter-household gifts in cash/kind. In addition, we do not find an impact of the Program on loans outstanding of the beneficiary. However, contributions made to social groups has increased by 29 percent, thus indicating that households are using the cash transfer to 're-enter' social networks.

4.2. The Zimbabwe Harmonized Social Cash Transfer Program

We use data collected for the evaluation of the Harmonized Social Cash Transfer (HSCT) Programme, an unconditional cash transfer program, introduced in 2011 by the Government of Zimbabwe. Program implementation is being done in a phased manner and it is anticipated that eventually the Program will cover the entire country. In January 2016, the Program covered 52,500 households, and approximately 300,000 households are expected to be eligible for the program at full-scale.

Benefits are structured such that the size of the transfer varies with household size: a one-person household receives USD10, two-person receives USD15, three-person receives USD20, and a household made up of four or more persons receives USD25. The program thus provides between $10 and $25 per month, which represents about 20 percent of total household consumption expenditure.

The program is targeted at households that are *food-poor and labor constrained*. Eligible households are identified through a detailed targeting census that is conducted by ZIMSTAT, the national statistical agency. All households are screened using the targeting survey fielded by ZIMSTAT, and data is then processed to compute a proxy poverty score that serves as the first eligibility criterion. A household is considered food-poor when it is living below the food poverty line[26] and is unable to meet the most basic needs of its members. A list of ten indicators that measure the ability of the household to meet basic needs is used to determine eligibility on this criterion.[27] At least three of these have to be met for the household to be eligible for the Program.

The Program has a clearly defined approach for categorizing a household as labor constrained, which is the second eligibility criterion. Throughout the paper, we use this definition

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[26] Food poverty line is the threshold where total household expenditure is below what is required to meet the food energy requirement for each household member, set at 2,100 kcal/day/person.

[27] The 10 indicators as given in Form1R, which is used for assessing eligibility are: only one or no meals per day; grains lasted for less than three months last harvest season; no/minimal livestock; no blankets; no rooms/huts for sleeping; rudimentary house material; live on begging or some piece work; get no/minimal regular support from relatives or others; have no valuable assets, e.g. animal drawn cart, vehicle; and the household is landless or owns less than one acre.

to operationalize the attribute of being labor constrained. A household is considered labor constrained when:

1. There is no able bodied household member between 18-59 years who is fit for productive work, OR

2. The dependency ratio is three or more, i.e., one fit to work household member between 18-59 years has to take care of three or more dependents. Dependents are those household members who cannot or should not work because they are under 18 years of age or they are elderly (over 59 years of age) or they are unfit for work because they are chronically ill or disabled or still in school, OR

3. The dependency ratio is between two and three and the household has a severely disabled or chronically sick household member who requires intensive care.

The phased roll out of the HSCT allows us to use households in regions slotted to enter the program at a later date to form a comparison group. Within districts the program operates at an administrative unit known as the Ward. Child Protection Committees (CPCs) are formed within each Ward who are responsible for ensuring that targeting of households is conducted thoroughly and who are in charge of communication of program rules and operational activities (such as payment dates) between the district social welfare office and beneficiary households. The geographic area of a Ward varies by population density as each Ward comprises a cluster of anywhere from 10-20 villages. The Ward comprises the primary sampling unit for the sample design.

Phase 1 of the HSCT expansion occurred in 2011-12 and covered ten districts. Wards for the treatment group of the evaluation were selected from Phase 2 areas, which entered the program in 2013. Wards for the control group were selected from areas that were slotted for Phase Four expansion and that were geographically close to Phase 2 areas. A detailed analysis of all Wards in these areas (Phase 2 areas and Phase 4 areas geographically close to Phase 2 areas) was then conducted by the study team led by the national research partner Ruzivo Trust based in Harare. Each Ward was assigned a point score based on five characteristics: forest cover, nearness to main roads, resistance to shocks, nearness to business centers, and water sources. On each criterion a Ward was scored from 1 (low) to 3 (high) and the maximum score possible was thus 15.[28] Power calculations based on the expected number of households per Ward indicated that a total of 60 Treatment and 30 Comparison Wards were necessary for the study.[29] The 60 treatment Wards were stratified across the three treatment districts (Mudzi, Mwenezi and Binga), and the 30 comparison Wards were likewise stratified to areas adjacent to the three treatment districts.

Wards in treatment areas were ranked from highest point score (most vulnerable) to lowest and paired with each stratum. Then, for each treatment Ward pair with a given score, a comparison Ward with the same score in the same stratum was selected to serve as the 'matched' comparison Ward. In cases where more than one comparison Ward existed with the same score, one was picked randomly. In cases where no comparison Ward existed with the exact same

[28] Details of the Ward level analysis are available upon request.

[29] Sample size calculations were based on the power to detect a meaningful change in the height-for-age z-score of children under age 60 months, the indicator for which the largest effective sample size was required (Handa et *al.*, 2013).

score, the Ward with the closest point score was selected. Figure 4.1 provides a map showing the geographic location within Zimbabwe of the study sites.

Figure 4.1. Map of Zimbabwe
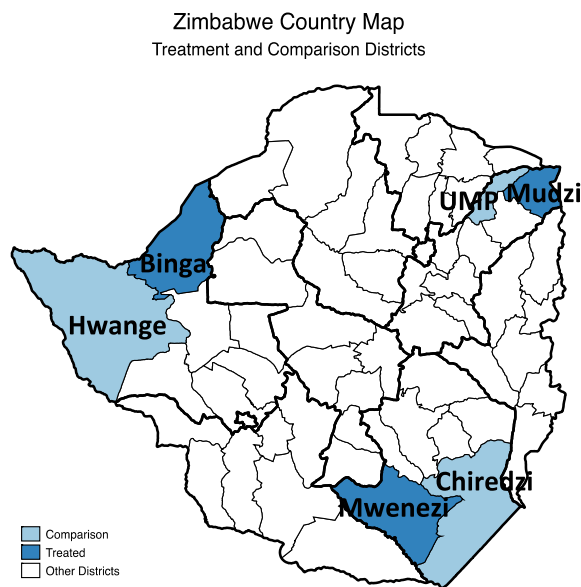
Zimbabwe Country Map
Treatment and Comparison Districts

Source: Constructed using Stata 13.1. The darker outlines in the map are province boundaries.
    Shape files obtained from http://www.gadm.org/

In the selected study Wards (both treatment and comparison), program targeting was conducted by the Department of Social Services following standard program operation guidelines. Out of the eligible households, the evaluation team randomly selected 34–60 households in each ward, using the random number generator tool in excel. This generated a sample of 3,063 households across 90 wards. Data were collected through a detailed household survey, conducted at baseline and 12-month follow-up. The study flow chart is provided in Figure 4.2. At follow up, the household attrition rate was 14 per cent. As part of the impact evaluation, detailed attrition analysis was conducted, and while differential attrition was ruled out, it was concluded that overall attrition (households remaining in the study were no longer

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representative of households in the original sample) might be a problem (American Institutes for Research, 2014). To correct for this problem, inverse probability weighting was used to adjust sampling weights. We use these generated analytical weights for our panel data impact analysis.

Note that all households in comparison Wards in the study sample are actual eligible households who will receive benefits once the program reaches their area, and eligibility criteria are the same across the country. Given the universal program take-up, these households thus serve as a close approximation for the counterfactual for treatment households. The distinction between this design and what might be deemed a perfect design--a social experiment-- is that Wards were not randomly assigned to treatment. In a large-scale national program where program roll out is determined by both technical (e.g. poverty) and political considerations, randomizing roll out is often not feasible. When the eligibility criteria are applied uniformly, targeting is supply-driven (as the case in Zimbabwe), and take-up is universal, the threat to internal validity in our design is the geographical differences across Phase 2 and Phase 4 areas. Our stratified matched design was chosen to minimize geographical differences.

Figure 4.2. Study Flow Chart

November 2012
Confirmation of ranking and matching process for treatment and comparison Wards by Ministry of Labour & Social Services and Ruzivo Trust

$\downarrow$

March – May 2013
Targeting and selection of beneficiary households in study Wards by ZIMSTAT

$\downarrow$

May 2013
Random sample of households pulled from eligibility list in each Ward

$\downarrow$

May – July 2013
Baseline Survey: 3063 households
Treatment: 2029 households in 60 Wards Comparison: 1034 households in 29 Wards

$\downarrow$

July 2013
Intervention Households receive cash payments

$\downarrow$

June-August 2014
Follow-up Survey: 2630 households (Attrition 14%)
Treatment: 1748/2029   Comparison: 882/1034

$\downarrow$

June – August 2017
End-line Survey Anticipated

4.3. Summary Statistics

Table 4.1 reports mean characteristics at baseline for both treatment and comparison groups. We retain only the panel sample of households for this part of our analysis. There are 1,746 households in the treatment group and 880 in the comparison group. To test for baseline balance between the two groups, we use OLS regressions with clustered standard errors at the ward level (to account for clustering of households within wards). None of the 29 key household variables listed were found to be statistically significantly different at the five per cent level across treatment and comparison groups at baseline.

The average household in the sample has a household size of about five with a per capita monthly expenditure of around $33-$35. Around 25-28 percent of these households take care of one or more disabled members. In addition, around 37 percent have at least one member who is chronically ill and almost two-thirds have one or more elderly members. These characteristics contribute to a high dependency ratio, which is reflected in the large number of households that are categorized as labor constrained (about 83-84 percent of the sample). That our sample should have such a high concentration of labor-constrained households makes sense because as mentioned earlier, one of the program criterions for household eligibility is labor-constrained status of the household. More than two-thirds of the main respondents are women, their average age is around 56-57 years, and more than half have had at least some level of schooling. About 10-11 percent households have a member that works for wages, but most of them are dependent on casual labor, what is known as 'maricho' labor in Zimbabwe—this is viewed as the least desirable form of work in rural areas of Africa. Aid received during the year is substantially lower for the treatment group.

Table 4.1. Baseline Mean Characteristics of Panel Sample Households

	Comparison Group		Treatment Group		
	Mean	Std. Error	Mean	Std. Error	*p*-Value
Household Demographics:					
Household Size	5.14	0.21	5.02	0.14	0.637
# Children under 5	0.80	0.06	0.76	0.05	0.618
# Children 6-17	2.21	0.12	2.23	0.08	0.937
# Adults 18 - 59	1.27	0.09	1.20	0.05	0.479
# Elderly (>60)	0.85	0.04	0.84	0.03	0.809
% households that have disabled members	27.78	0.02	25.29	0.01	0.267
% households that have chronically ill members	37.37	0.02	36.83	0.01	0.844
% households that have elderly members	64.80	0.03	64.17	0.02	0.857
% households categorized as labor constrained	82.95	0.02	84.01	0.01	0.641
Main Respondent Characteristics:					
% Female	65.90	0.02	69.56	0.02	0.173
Age (Yrs)	56.68	1.40	56.29	0.88	0.808
% Widowed	37.30	0.02	37.09	0.02	0.944
% Divorced/Separated	8.08	0.01	9.57	0.01	0.350
% Main resp. has schooling	60.92	0.03	55.84	0.02	0.111
% Main resp. currently attends school	1.30	0.01	1.66	0.00	0.573
Highest grade of Main resp.	3.47	0.12	3.30	0.14	0.334
Household Characteristics:					
Monthly Per Capita Total Expenditure (in usd)	34.96	2.46	32.41	1.14	0.351
Monthly Per capita Food Expenditure (in usd)	22.11	1.79	20.62	0.88	0.459
HFIAS Score (1-27)	13.87	0.40	14.04	0.27	0.747
# of shocks experienced	2.44	0.21	2.69	0.13	0.310

% households that have suffered from a shock	86.09	0.02	90.07	0.01	0.148
% households where death has occurred in 12 mo	8.68	0.01	10.26	0.01	0.229
# of livestock type	2.27	0.09	2.20	0.08	0.571
% households that receive wages	10.97	0.01	10.24	0.01	0.642
% households undertaking casual/maricho labor	48.49	0.03	46.22	0.02	0.581
Aid received (in USD)	76.85	14.04	54.25	3.43	0.122
Distance to Food Market (Km)	3.34	0.46	3.87	0.24	0.310
Distance to Input Market (Km)	20.40	2.23	18.74	1.47	0.537
Distance to Water Source (Km)	1.29	0.21	1.36	0.11	0.748
N	882		1746		

Notes: Attrition-adjusted weighted results. *p*-values obtained by clustering at ward level.

Table 4.2 provides incidence and value of inter-household transfers and related outcomes across our two study arms and two time periods. There is a statistically significant difference between percent of households that receive inter-household transfers across treatment and comparison groups at baseline. More than half the households in the treatment group and more than one-third in the comparison group receive gifts in cash or kind from other households at baseline. This declines by about eight percentage points in 2014 for the treatment group and by sixteen percentage points in the Comparison groups. The monetary value of transfers received has also declined across both treatment and comparison groups. On the other hand, percentage of households that make gifts in cash/kind has increased. At baseline, 12-14 percent households in our sample were making cash/in-kind gifts. This increases to 21 percent for the treatment group and 15 percent for the comparison group at follow-up. However, value of transfers made has declined from $69.5 per household to $48 per household for the treatment group (or $25 per capita to $20 per capita). This decline may be because of lower value of transfers made by

households who have started making transfers in the follow-up period. Indeed, average per capita value of transfers made across the entire treatment sample has increased from $3 at baseline to $4 at follow-up. Value of transfers made has increased for the Comparison group.

We construct an indicator called reciprocity, which takes on a value of one if the household has both received a transfer and made a transfer to another household in the same time period. About 14-15 percent of the households in our sample demonstrate reciprocity, across both treatment and comparison groups. Further, we also construct indicators for households that did not receive/make a transfer, but indicate that there is someone they could have potentially approached to request help in the form of cash or gifts in kind and likewise, that they know of someone who they in turn would potentially help, if requested. Households that could potentially undertake such transfers comprise about 14 percent of our treatment group at baseline, with a slight reduction to 12 percent at follow-up. The reduction is however larger for the comparison group, declining from 9-12 percent at baseline to about 5 percent at follow-up.

Inter-household transfers are just one mechanism by which poor households manage risk and cope with liquidity constraints. Households may increase contributions made to a social network such as a church, or a farmer's group[30]. The cash may also enhance the ability of a beneficiary to take out a loan, as he or she will be more credit worthy owing to a predictable source of income that is promised by the program. The beneficiary household might also use the transfer amount to pay off an outstanding loan. On the other hand, the HSCT may not only crowd out private inter-household transfers as previously described but also aid received from

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[30] We specifically asked for eight such networks: church, women's livelihood group, trade association, farmer group, business cooperative, labor unions, youth association and burial society

other Government and Non government programs. The averages for these related outcomes are shown in the bottom panel of Table 4.2. At baseline, about 40 percent of the households made monetary contributions to social networks. While this stayed constant for the comparison group, the number of households making contributions increased to 50 percent for the treatment group. Aid received is higher for the comparison group during both time periods. Aid received and the number and amount of loan outstanding declined for both groups at follow-up.

Table 4.2. Means of Inter-Household Transfers and Related Outcomes by Treatment and Comparison Groups

| | Treatment | | | | Comparison | | | | *p*-value of baseline difference |
| | Baseline | | Follow-up | | Baseline | | Follow-up | | |
	N	Avg.	N	Avg.	N	Avg.	N	Avg.	
Inter-Household Transfer Received									
% Households that Rcvd Gifts from other Households (0/1)	1748	56.4	1748	48.2	882	69.2	882	52.6	0.001
Value of Gifts Rcvd: sub sample ($)	964	118.8	885	75.2	569	153.2	536	134.3	0.113
Per capita Value of Gifts Rcvd: sub sample ($)	964	35.7	885	26.3	569	48.3	536	44.8	0.068
Per capita Value of Gifts Rcvd: entire sample ($)	1745	20.1	1748	12.7	879	33.4	882	23.5	0.009
Inter-Household Transfer Made:									
% Households that MADE Gifts to other Households (0/1)	1748	13.6	1748	20.8	882	12.3	882	15.0	0.595
Value of Gifts MADE: sub sample ($)	207	69.5	351	48.2	109	28.5	154	52.3	0.171
Per capita Value of Gifts MADE: sub sample ($)	207	25.2	351	20.8	109	7.2	154	16.3	0.139
Per capita Value of Gifts MADE: entire sample ($)	1747	3.4	1748	4.3	881	0.9	882	2.4	0.157
Reciprocity & Potential for receiving/making transfers:									
% Reciprocity (0/1)	1035	14.9	985	26.5	601	13.9	556	24.4	0.726
% Households that have potential households to request for a transfer (Yes=1)	781	13.4	863	12.1	310	9.9	356	4.7	0.208
% Households can potentially make a transfer if requested (Yes=1)	1540	13.9	1397	12.3	772	12.4	728	4.9	0.501

Related Outcomes:

% Households that made contributions to Social Networks? (Yes=1)	1748	39.7	1748	49.6	882	40.6	882	40.4	0.804
Contributions made to Networks: sub sample ($)	656	33.3	806	33.6	352	23.0	372	27.0	0.128
Contributions made to Networks: entire sample ($)	1748	13.2	1748	16.7	882	9.4	882	10.9	0.213
Aid received from NGOs and other Govt Programs ($)	1748	54.3	1748	29.3	882	76.8	882	42.5	0.122
% Households that took out a loan? (Yes=1)	1748	9.4	1748	7.1	882	8.8	882	6.5	0.692
Amount of loan outstanding: sub sample ($)	139	80.1	105	79.3	73	93.3	47	136.0	0.682
Amount of loan outstanding ($): entire sample ($)	1748	7.5	1748	5.6	882	8.2	882	8.9	0.835

Notes:

'sub sample' means that sample is restricted to only those hhlds that receive/make transfers/contributions/loans

'entire sample' means that it is coded zero for hhlds that receive/make transfers/contributions/loans

Notes: Weighted means, *p*-values obtained by clustering at ward level

4.4 Baseline Determinants of Inter-household Transfers

In Table 4.3, we utilize Ordinary Least Squares (OLS) and baseline data to understand how key socioeconomic characteristics of the household are associated with gifts received and made by households. The estimating equation is as follows:

Equation (1):

$$Y_h = \beta_0 + \beta_1 HHMainResp_h + \beta_2 HHDemographics_h + \beta_3 X_h + \beta_4 Reciprocity_h + \varepsilon_h$$

where

Y_{hj} is the inter-household gift received or made by household 'h' in ward 'j'. There are four outcomes of interest: 1) Incidence of Gift received, 2) Value of gift received, 3) Incidence of Gift Made, and 4) Value of Gift Made

HHMainResp refers to the household's Main Respondent characteristics, which include age and indicators for if the main respondent is female, widowed, divorced/separated, has attended school, and is chronically sick.

HHDemographics refer to household size and number of children and elderly

X is a vector of other independent variables that have an important relationship in influencing the probability and amount of inter-household transfers. These include variables that measure the household's ownership of assets and means of livelihood. It includes a productive assets score[31]; a household amenities score[32];

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[31] We use Principal Components Analysis to identify the principal components of 30 different variables that indicate ownership of assets such as tractor, plough, and other agricultural tools and total land area of the household. Based on this analysis and the scree plot shown in Appendix A Figure A.1a, we retain the first principal component as our Physical Assets score for the household, which explains 21.5 percent of the variability in the data. The subsequent components each explain less than six percent of the variation.

[32] Household amenities score is made up of variables such as if the house has: a toilet; a cooking room; ventilation in the cooking room; access to energy for lighting such as kerosene, diesel, electricity or solar

indicators for whether the household gets wages from wage labor, does casual

(maricho) labor, has planted any crops this harvest season, is labor constrained,

has any loan amount outstanding, has been exposed to an idiosyncratic shock such

as death of a working family member or covariate shocks such as droughts or

floods; and a variable that measures the dollar amount of social support the

household receives from any NGO/Government body.

Reciprocity includes four indicators that capture if the household has

received/made a transfer and if the transfer is made with any expectation of a quid

pro quo.

We also control for the geographical province within which the households are

located.

According to results shown in Table 4.3, there is no clear pattern of the type of

households that are more likely to receive or make gifts, although the coefficients are largely in

the expected direction. If the main respondent is female then the household is significantly more

likely to receive gifts and if female households make any gifts to other households, these

transfers are 62 percent lower in value as compared to male respondents. Those who are

widowed are more likely to receive a gift and less likely to make one. Ownership of productive

assets increases the value of gifts made as well as received. If the household receives income

from wages, then it is significantly more likely to make gifts and the value of gifts it makes are

higher by 70 percent. If the household has planted crops in the last season, the value of the gifts

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power; more than two rooms; and sturdy walls made of bricks, stone or cement. We again utilize
Principal Components Analysis and the scree plot associated with this is shown in Appendix A Figure
A.1b. Here also we retain the first component as the Amenities score for the household. It explains 31.3
percent of the variation among the variables.

it receives decreases significantly. If the household has taken out a loan, the value of a transfer it

makes is significantly higher. If the household has suffered from an idiosyncratic shock, then it is

significantly more likely to receive a gift and value of any transfer it makes is significantly

reduced. However, if it has suffered from a covariate shock such as a drought or flood, which

affects other households in the area, then as expected, the value of transfers it receives is

reduced. Value of the gift received or made declines significantly if the transfer comes with the

understanding that it will be returned in the future. Perhaps the most interesting result in this

analysis is that a household is 14 percentage points more likely to receive a gift if it has made

one, and likewise it is 7 percentage points more likely to make a transfer if it has received one.

Table 4.3. Socioeconomic Variables Associated with Gifts Received or Made (Baseline Sample)

	Gifts Rcvd. 0/1	Per capita Gifts Rcvd. Log of USD	Gifts Made 0/1	Per capita Gifts Made Log of USD
Main Respondent Characteristics				
Female Household	0.070**	0.069	0.016	-0.615***
Age of Head	0.001	-0.003	-0.001	-0.004
Widowed	0.062*	-0.002	-0.069***	0.134
Divorced/Separated	-0.023	-0.219	-0.03	-0.201
Main resp. has schooling	0.013	-0.081	0.016	-0.095
Main resp. is chronically ill	0.005	0.046	0.026	-0.438*
Household Demographics				
Log of Household Size	-0.157**	-1.271***	-0.065*	-1.517***
Number of elderly	0.013	-0.015	-0.029	-0.251
Number of children	0.013	-0.044	0.000	-0.024
Other Covariates				
Household Amenities score	0.004	0.047	0.009	0.093
Productive Assets score	0.003	0.112***	0.020***	0.184***
Any income from wage labor? (Yes=1)	-0.054	-0.134	0.148***	0.703***
Any income from maricho labor? (Yes=1)	-0.048*	-0.075	0.015	-0.167
Labor Constrained	0.014	0.064	-0.013	0.354
Planted crops last rainy season (Yes=1)	-0.062	-0.359***	0.050**	-0.776

Aid received (in USD)	0.001***	0.002***	0.000	0.000
Household took out a loan	-0.02	0.043	0.053	0.451*
Suffered from idiosyncratic shock? (Yes=1)	0.074**	-0.153	0.009	-0.437**
Suffered from covariate shock? (Yes=1)	-0.001	-0.250***	0.013	-0.301
Mashona	0.013	0.026	0.063***	-0.125
Masvingo	0.138***	0.347**	0.016	0.401
Reciprocity				
Made a transfer	0.143***	-0.096		
Expects to give something back in return (Yes=1)		-0.667***		
Received a Transfer			0.072***	-0.239
Expects recipient to give something in return (Yes=1)				-0.363**
Constant	0.537***	5.520***	0.149**	5.581***
Observations	2615	1528	2615	316
Adjusted R-squared	0.112	0.281	0.073	0.442

Notes: Weighted results, standard errors were clustered at the ward level.
* p<0.10 ** p<0.05 *** p<0.01

4.5. Impacts on Inter-Household Transfers and Related Outcomes

We utilize the longitudinal sample containing baseline and 12-month follow-up data to conduct a difference-in-differences (D-in-D) analysis to estimate the impact of the program on inter-household transfers.

Crowding-out can occur on the extensive margin, i.e. the probability of receiving a transfer, and on the intensive margin, i.e. amount of transfer conditional on it being positive. (Gerardi & Tsai, 2013). We therefore estimate Equation (2) below, first testing for the likelihood of incidence of an informal transfer (gift received or made) and then use a continuous variable measuring the monetary value of the transfer as the dependent variable in cases where the transfer has been made.

Equation (2):

$$Y_{hjt} = \beta_0 + \beta_1 Post_t + \beta_2 Transfer_j + \beta_3 Transfer * Post_{jt}$$

$$+ \beta_4 HHDemographics_h + \beta_5 HHMainResp_h + \beta_6 Strata_j + \beta_7 Prices_{jt} + \varepsilon_{hjt}$$

where

Y_{hjt} is the outcome of interest for household h from Ward j at time t

First Part: Y_{hjt} equal to 1 if the household received an informal transfer

Second Part: Y_{hjt} equal to $ amount of the transfer if $Y_{hjt} > 0$ (using the same

covariates)

$Post_t$ is an indicator that equals 1 if the time period is 2014 (12 month follow-up)

$Transfer_j$ is an indicator that equals 1 if household is in a treatment Ward

$HHDemographics_h$ refers to log of household size, and the number of people

below 5, between 6-17, between 18-60, and those above 60.

$Prices_{jt}$ refer to a vector of cluster level prices of eight staple items.

HHMainResp refers to the same vector of variables as in Equation (1).

β_3 represents the impact estimator, or the effect of being a cash transfer beneficiary. We run ordinary least squares (OLS) regressions, clustering standard errors at the ward level. We control for baseline values for main respondent characteristics and household demographics except for prices, which we maintain as exogenous and allow to vary by time period. The program has had no inflationary effect in treatment wards.

Table 4.4 provides results of our difference-in-differences model on our outcomes of interest (averages of which are provided in Table 4.2). Almost none of the impact estimates on

both incidence or value of gifts exchanged are significant, with one exception. Households that state they would potentially provide help, in case of need, to someone they know has increased by five percent.

In the panel comprised of related outcomes, we find that the HSCT has increased the probability of a household making a contribution to a social network by nine percentage points and, the value of the contribution, if its made, has increased by about 29 percent. However, the program has not led to an increase in the probability of the beneficiary taking out a loan, nor has it decreased the size of the loan. There are no significant impacts on amount of aid received.

In Table 4.5, we conduct a subsample analysis and stratify households based on gender and on transfer value per person as a share of their per capita expenditure. We choose 20 per cent as a cut-off because experience from the Transfer Project indicates that impacts are substantially smaller and more inconsistent when the transfer is less than 20 per cent of pre-program consumption (Davis and Handa, 2015). We stratify by gender of main respondent[33] because previous research has shown that economic inequalities exist by gender (Flato et al, 2017). Female-headed households are more likely to have a higher number of children and elderly (Milazzo & van de Walle, 2015), and at the same time relatively poorer access to land, formal employment, and credit markets (World Bank, 2012). This is true for our current sample too. Male-headed households owned larger plots of land, had a slightly higher use and purchase of crop inputs, were more likely to own livestock and have a larger herd size and men were more likely to be engaged in wage employment (American Institutes for Research, 2013).

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[33] We use main respondent as a proxy for household head here. Our survey did not explicitly ask for 'Household Head'. An inconsistent definition and no accepted definition of headship is a challenge in this literature.

Our stratified results are similar to the total sample in that there is no evidence of crowding-out of inter-household transfers. In fact, for households where the transfer is greater than 20 percent of per capita total monthly expenditure, we find a four percentage points increase in the incidence of gifts made in cash or kind to other households. For male-respondent households, while there is no change in the incidence of gifts made, we find a substantial decrease in the value of gifts made by the 284 households that are making transfers. This impact however does not hold if we include the entire subsample of 1663 male-respondent households. We also see an increase of almost 9 percentage points in the number of male-respondent households who do not currently receive transfers but can potentially request a transfer if they feel the need.

There is a 7 percentage point increase in households who do not yet make transfers but say that they could potentially make a transfer if requested by someone in need for two sub-samples: female-respondent households and households that receive less than the 20 per cent cutoff of per capita monthly expenditure. Both these subsamples also see a significant increase in the number of households who have started making contributions to social networks by about 10-percentage point for the latter subgroup and 12 percentage points for female-respondents.

The impact estimate on value of contributions made to social networks is significant for all samples except the male-respondent sample. The magnitude of the impact is high, ranging from 26 per cent for households receiving a transfer size more than 20 per cent cutoff to 38.4 per cent for female-respondents. It is highest for households with a female respondent and not

significant for male respondent households. This is as expected since females typically have restricted access to credit and insurance markets and need to rely on informal arrangements and social groups to insure against risk and overcome liquidity constraints. In so far as the Program is enabling female-respondent households to start making contributions to social groups and increase their participation in these, it is strengthening informal networks for the specific vulnerable demographic category of females. It is important however to mention that female-headed households can be a heterogeneous category where in not all such households are necessarily vulnerable. Recent research coming out of Latin America (Liu et al, 2017) has critiqued the 'feminization of poverty' paradigm and indicated that in certain cases female headship in fact indicates increased female empowerment. However, due to the fact that most female-headed households are female-headed due to widowhood or separation, the empirical results indicate a close correlation between female-headship and poorer living conditions.

Similar to the overall results provided in Table 4.4 for the entire sample, in our subsample analysis too we do not find impacts of the Program on the probability of the beneficiary taking out a loan, or size of loan, or on amount of aid received.

Table 4.4. Impacts Estimates on Inter-Household Transfers and Related Outcomes

		DinD	Tac	Time	N	adj. R-sq
Inter-Household Transfers Received						
(1)	Households that Rcvd Gifts from other Households (0/1)	0.066 (0.063)	-0.135*** (0.033)	-0.130** (0.060)	5258	0.064
(2)	Households that Rcvd Gifts from other Households (0/1): Sample restricted to those who received a transfer at baseline	-0.024 (0.060)	-0.009 (0.016)	-0.451*** (0.057)	3077	0.347
(3)	Value of Gifts Rcvd (annual per capita LOG USD): only for sample that receives transfers	-0.146 (0.174)	-0.313** (0.136)	-0.381*** (0.125)	2953	0.235
(4)	Value of Gifts Rcvd (annual per capita LOG USD): only for sample that receives transfers; Sample restricted to those who received a transfer at baseline	-0.233 (0.187)	-0.319** (0.129)	-0.335** (0.132)	2413	0.244
(5)	Value of Gifts Rcvd (annual per capita LOG USD): coded such that it is zero for hhlds that do not receive transfers	0.231 (0.226)	-0.603*** (0.151)	-0.638*** (0.207)	5252	0.154
Inter-Household Transfers Made						
(6)	Households that MADE Gifts to other Households (0/1)	0.037 (0.026)	0.006 (0.022)	0.046** (0.022)	5258	0.037
(7)	Value of Gifts MADE (annual per capita LOG USD): only for sample that makes transfers	-0.488 (0.298)	0.159 (0.193)	0.523** (0.225)	821	0.237
(8)	Value of Gifts MADE (annual per capita LOG USD): coded such that it is zero for hhlds that do not make transfers	-0.015 (0.066)	0.053 (0.044)	0.137** (0.059)	5256	0.037

Reciprocity & Potential for receiving/making transfers:

(9)	Reciprocity	0.004	0.000	0.125***	3176	0.054
		(0.033)	(0.026)	(0.026)		
(10)	Household has potential households which it can request for a transfer (1 = Yes)	0.027	0.024	-0.036	2299	0.033
		(0.027)	(0.022)	(0.023)		
(11)	Household can potentially make a transfer if requested (1 = Yes)	0.050**	0.012	-0.077***	4435	0.053
		(0.021)	(0.014)	(0.016)		
Other Related Outcomes						
(12)	Has made Contributions Made to Social Networks? (1 = Yes)	0.093***	0.006	-0.003	5258	0.085
		(0.035)	(0.032)	(0.027)		
(13)	Contributions made to Networks (LOG USD)	0.294***	0.031	0.011	5258	0.099
		(0.092)	(0.093)	(0.074)		
(14)	Contributions made to Networks (LOG USD) sub sample	0.150	-0.015	0.030	2186	0.059
		(0.122)	(0.089)	(0.088)		
(15)	Aid received from NGOs and other Govt Programs (LOG USD)	-0.063	-0.375	-0.446*	5258	0.093
		(0.253)	(0.307)	(0.250)		
(16)	Took out a loan? (1 = Yes)	0.004	0.005	-0.016	5258	0.025
		(0.019)	(0.014)	(0.013)		
(17)	Amount of loan outstanding (Log USD)	-0.246	-0.278	0.289	364	0.070
		(0.286)	(0.208)	(0.228)		

Notes:

* p<0.10   **p<0.05   ***p<0.01

Standard errors clustered at the district-ward level in parentheses.

Estimations use difference-in-difference modeling among panel households. All estimations control for baseline household size, main respondent's gender, age, education and marital status, province, household demographic composition, and a vector of cluster level prices.

Table 4.5. Impacts Estimates on Inter-Household Transfers and Related Outcomes: Subsample analyses

		Households where transfer is >=20% of p.c. total exp.		Households where transfer is< 20% of p.c. total exp.		Households with Female Respondent		Households with Male Respondent	
		DinD	N	DinD	N	DinD	N	DinD	N
Inter-Household Transfers Received									
(1)	Households that Rcvd Gifts from other Households (0/1)	0.101 (0.070)	2754	0.035 (0.067)	2504	0.058 (0.066)	3594	0.080 (0.079)	1664
(2)	Households that Rcvd Gifts from other Households (0/1): Sample restricted to those who received a transfer at baseline	0.007 (0.064)	1544	-0.044 (0.069)	1533	-0.041 (0.059)	2175	-0.001 (0.083)	902
(3)	Value of Gifts Rcvd (annual per capita LOG USD): only for sample that receives transfers	-0.091 (0.254)	1507	-0.245 (0.187)	1446	-0.223 (0.199)	2076	0.032 (0.200)	877
(4)	Value of Gifts Rcvd (annual per capita LOG USD): only for sample that receives transfers; Sample restricted to those who received a transfer at baseline	-0.193 (0.253)	1195	-0.317 (0.204)	1218	-0.300 (0.216)	1719	-0.064 (0.214)	694
(5)	Value of Gifts Rcvd (annual per capita LOG USD): coded such that it is zero for hhlds that do not receive transfers	0.339 (0.231)	2752	0.110 (0.253)	2500	0.171 (0.251)	3589	0.356 (0.228)	1663
Inter-Household Transfers Made									

(6)	Households that MADE Gifts to other Households (0/1)	0.041* (0.022)	2754	0.021 (0.042)	2504	0.043 (0.031)	3594	0.027 (0.040)	1664
(7)	Value of Gifts MADE (annual per capita LOG USD): : only for sample that makes transfers	-0.342 (0.450)	336	-0.559 (0.357)	485	-0.127 (0.316)	537	-1.240*** (0.375)	284
(8)	Value of Gifts MADE (annual per capita LOG USD): coded such that it is zero for hhlds that do not make transfers	0.038 (0.056)	2753	-0.082 (0.119)	2503	0.012 (0.076)	3593	-0.061 (0.102)	1663

Reciprocity & Potential for receiving/making transfers:

(9)	Reciprocity	-0.000 (0.037)	1596	-0.009 (0.051)	1580	0.005 (0.041)	2212	0.010 (0.056)	964
(10)	Household has potential households which it can request for a transfer (1 = Yes)	0.060 (0.045)	1245	-0.008 (0.037)	1054	-0.008 (0.035)	1513	0.085* (0.050)	786
(11)	Household can potentially make a transfer if requested (1 = Yes)	0.025 (0.030)	2417	0.067** (0.028)	2018	0.072** (0.029)	3056	0.006 (0.032)	1379

Other Related Outcomes

(12)	Has made Contributions Made to Social Networks? (1 = Yes)	0.073 (0.046)	2754	0.104** (0.046)	2504	0.115*** (0.039)	3594	0.048 (0.065)	1664
(13)	Contributions made to Networks (LOG USD)	0.261** (0.109)	2754	0.324** (0.136)	2504	0.384*** (0.108)	3594	0.107 (0.203)	1664

(14)	Contributions made to Networks (LOG USD) sub sample	0.276* (0.145)	938	0.072 (0.150)	1248	0.235* (0.137)	1514	-0.143 (0.248)	672
(15)	Aid received from NGOs and other Govt Programs (LOG USD)	-0.118 (0.345)	2754	-0.023 (0.235)	2504	-0.293 (0.273)	3594	0.422 (0.274)	1664
(16)	Took out a loan? (1 = Yes)	-0.022 (0.024)	2754	0.022 (0.028)	2504	0.016 (0.023)	3594	-0.023 (0.026)	1664
(17)	Amount of loan outstanding (Log USD)	-0.027 (0.395)	181	-0.296 (0.544)	183	-0.158 (0.318)	245	-0.080 (0.399)	119

Notes:

* p<0.10   **p<0.05   ***p<0.01

Standard errors clustered at the district-ward level in parentheses.

The Ns in this table refer to subpopulation number of observations

Estimations use difference-in-difference modeling among panel households. All estimations control for baseline household size, main respondent's gender, age, education and marital status, province, household demographic composition, and a vector of cluster level prices.

4.6. Conclusion and Policy Implication

In this paper, we analyzed the Zimbabwe Harmonized Social Cash Transfer Program, a government-run unconditional cash transfer program in Zimbabwe, targeted to ultra-poor households who are food poor and labor constrained. Specifically, we asked if the HSCT had crowded-out inter-household transfers, which includes remittances and gifts from family, friends, and neighbors. We find that on average, the HSCT has not led to a crowding-out effect on private inter-household informal transfers. We also do not find any impact of the Program on loans and amount outstanding of the beneficiary.

One important result, however, is that the number of households making contributions to social groups has increased by 9 percentage points and further, the value of these contributions has increased by 29 percent. This indicates that the HSCT provides the beneficiary with an increased ability to participate in community life and 're-enter' social networks, which increases their social inclusion, which would in turn have an impact on their economic and mental wellbeing. Further we find that these impacts are higher for the specific demographic category of female-respondent households. There is an increase of almost 12 percentage points in the number of female-respondent households who make contributions and a 38 per cent increase in the value of these contributions. As per previous research, females have typically restricted access to credit and insurance markets and formal wage employment. Informal networks are one channel they utilize to cope with idiosyncratic risk and/or liquidity constraints. The fact that a cash transfer program can enable women to strengthen their networks points to an important role they fulfill as a social protection program.

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APPENDIX A: Remaining Tables and Figures for Chapter 2

Figure A.1a. Scree Plot after PCA for Productive Assets Owned by the Household
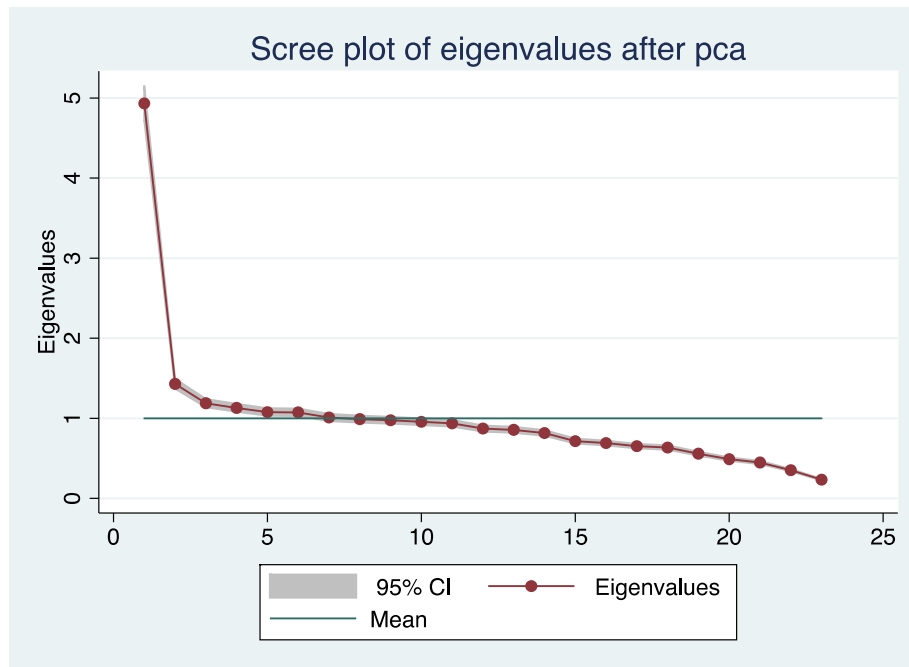
Figure A.1b. Scree Plot after PCA for Household Amenities
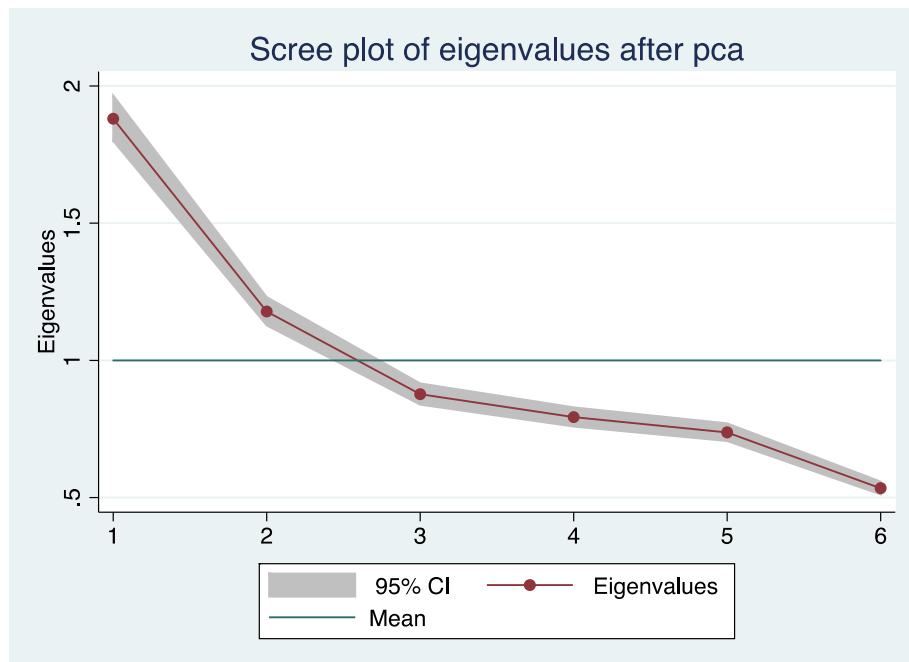
Figure A.2. Age Distribution of Household Members
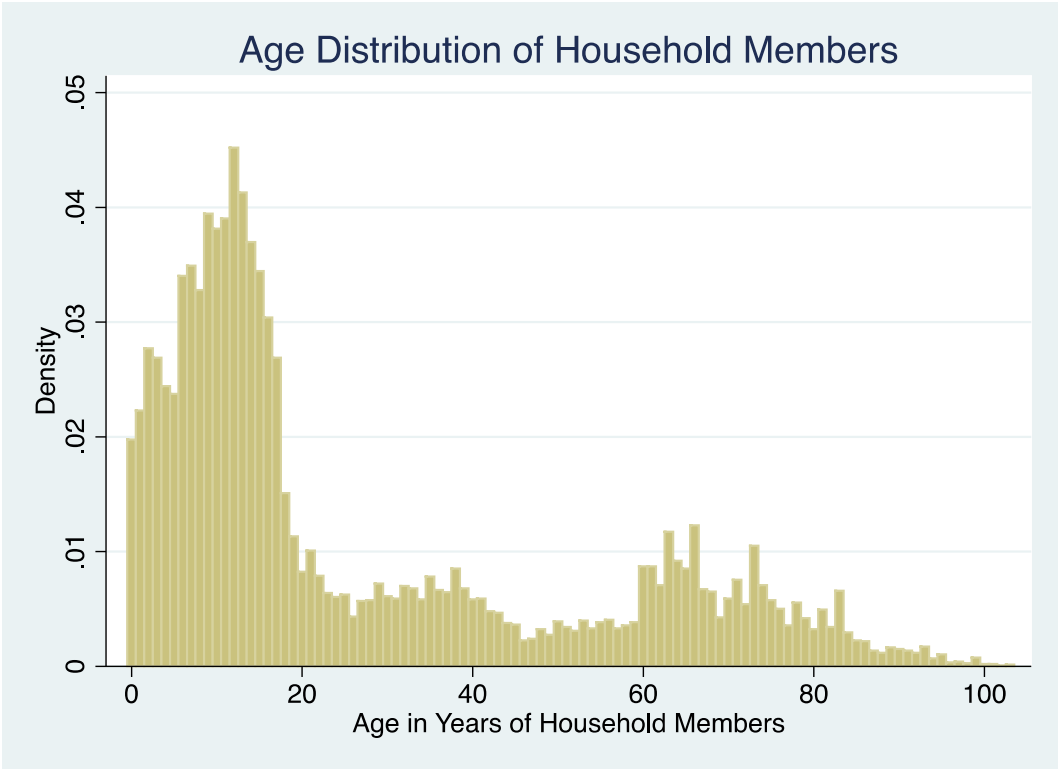
Figure A.3. Kernel Densities of Household Food Security and Food Consumption
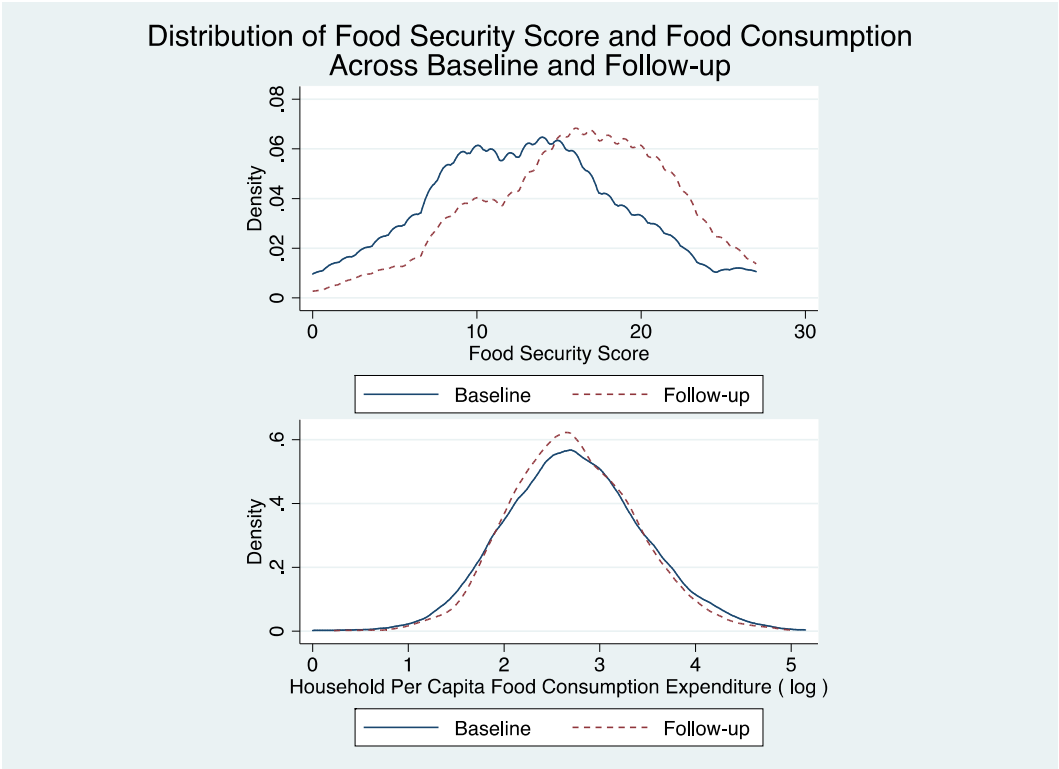
Table A.1. Full Results from Interacted Model Comparing Pre/Initial Harvest vs. Peak Harvest

	(1)		(2)	
	Food Security Score		Log P.C. Food Consumption	
	Estimate	Interacted Estimate	Estimate	Interacted Estimate
Pre/Initial Harvest Dummy	5.799*		-0.104	
	(3.092)		(0.267)	
Household Demographics:				
Household Size (log)	-0.036	1.682	-1.499***	0.090
	(1.136)	(1.710)	(0.196)	(0.245)
# Children under 5	-0.277	-0.233	0.098**	-0.056
	(0.332)	(0.452)	(0.049)	(0.076)
# Children 6-17	-0.469**	0.157	0.081**	-0.019
	(0.211)	(0.296)	(0.039)	(0.049)
# Adults 18 - 59	0.103	-0.903**	0.098***	0.027
	(0.340)	(0.447)	(0.032)	(0.041)
# Elderly (>60)	0.003	-0.604	0.112**	-0.069
	(0.378)	(0.531)	(0.052)	(0.078)
Main Respondent Characteristics:				
Female	-0.680*	-0.344	-0.084*	0.003
	(0.343)	(0.645)	(0.044)	(0.068)
Age	-0.029	0.005	-0.002	0.001
	(0.019)	(0.025)	(0.002)	(0.002)
Widowed (Yes=1)	0.128	-0.248	0.067	-0.123
	(0.456)	(0.778)	(0.063)	(0.089)
Divorced/Separated (Yes=1)	0.915	-0.250	0.046	-0.055
	(0.621)	(0.878)	(0.067)	(0.111)
Attended School (Yes=1)	0.234	0.271	0.064	0.008
	(0.598)	(0.708)	(0.048)	(0.070)
Other Socio-Economic Characteristics:				
Distance to Food Market	-0.100**	0.099*	0.005*	-0.011*

	(0.042)	(0.054)	(0.003)	(0.006)
Distance to Input Market	0.038***	-0.035*	0.000	-0.000
	(0.013)	(0.020)	(0.001)	(0.001)
Distance to Water Source	0.024	-0.144	-0.019*	0.003
	(0.170)	(0.204)	(0.011)	(0.022)
Productive Assets Score	0.518***	-0.250	0.070***	-0.014
	(0.162)	(0.229)	(0.011)	(0.019)
Household Amenities Score	0.660***	-0.172	0.052***	-0.027
	(0.188)	(0.240)	(0.015)	(0.020)
# of livestock type	0.078	0.115	0.036***	0.013
	(0.166)	(0.262)	(0.012)	(0.019)
Any income from wage labor? (Yes=1)	1.893**	0.209	0.137**	0.029
	(0.724)	(0.868)	(0.059)	(0.101)
Any income from maricho labor? (Yes=1)	-0.281	-1.410**	0.071*	-0.046
	(0.527)	(0.632)	(0.042)	(0.062)
Planted crops last rainy season (Yes=1)	2.174***	-1.206	-0.042	0.037
	(0.665)	(1.147)	(0.070)	(0.100)
Labor Constrained (Yes=1)	0.784	-3.422***	0.010	0.066
	(0.700)	(1.060)	(0.064)	(0.075)
Aid received (in USD)	-0.004*	0.004	-0.000	0.001**
	(0.002)	(0.002)	(0.000)	(0.000)
Monthly remittances low (< $25/month)	-0.317	-2.709**	-0.141**	-0.099
	(0.774)	(1.071)	(0.070)	(0.081)
Has loan outstanding (Yes=1)	-1.013*	1.286	0.136**	0.039
	(0.606)	(1.214)	(0.068)	(0.162)
Suffered from a shock? (Yes=1)	-1.056	-0.632	0.027	-0.132

		(0.756)	(0.985)	(0.063)	(0.083)

Other Covariates:				
Masvingo	-0.448	-1.240	0.209***	0.149**
	(0.628)	(0.856)	(0.046)	(0.073)
Constant	15.191***		4.795***	
	(2.559)		(0.234)	
Observations	2121		2121	

Notes:

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

Standard errors in parentheses, clustered at the ward level. Standardized baseline weights utilized. Mashonaland observations not included.

Table A.2. Difference-in-Difference Model: Impact of the Cash Transfer on Food Security Measures (without controlling for week of interview)

	(1)	(2)	(3)
	Per capita Food Consumption	**Household Food Security Score**	**Household Diet Diversity Score**
Impact Estimate	1.648	0.094	0.716***
	(1.146)	(0.573)	(0.189)
Treatment Indicator	-1.295	0.179	-0.195
	(1.175)	(0.440)	(0.124)
Follow-up Indicator	-3.287***	3.098***	0.412**
	(1.174)	(0.494)	(0.169)
Observations	5245	5245	5245
Adjusted R-squared	0.323	0.109	0.191

Notes:

* p<0.10   **p<0.05   ***p<0.01

Standard errors clustered at the Ward level in parentheses.

Estimations use difference-in-difference modeling among panel households. All estimations control for baseline household size, main respondent's gender, age, education and marital status, strata, household demographic composition, and a vector of cluster level prices.

APPENDIX B: Remaining Tables and Figures for Chapter 3

Table B.1. Household Level Estimates of Differential Attrition

	Not Weighted		Weighted	
	Coefficient of Variable	**Coefficient of Interacted Variable**	**Coefficient of Variable**	**Coefficient of Interacted Variable**
	(1)	(2)	(3)	(4)
Treatment	-0.1301		-0.1022	
	(-1.27)		(-0.67)	
Household Size	-0.0139***	0.0036	-0.0181***	0.0082
	(-3.29)	(0.65)	(-3.59)	(1.39)
% households that have disabled members	0.0107	0.0025	0.0068	-0.0017
	(0.50)	(0.09)	(0.25)	(-0.05)
% households that have chronically ill members	0.0072	-0.0022	-0.006	-0.0014
	(0.28)	(-0.08)	(-0.23)	(-0.05)
% households that have elderly members	-0.0488	0.0278	-0.0957	0.0918
	(-1.37)	(0.66)	(-1.29)	(1.15)
% households categorized as labor constrained	-0.0158	-0.0044	-0.0333	-0.0107
	(-0.61)	(-0.13)	(-1.32)	(-0.27)
Main Respondent Characteristics:				
Female	-0.0121	0.0035	0.0145	-0.0399
	(-0.39)	(0.09)	(0.27)	(-0.70)
Age	-0.0014	0.0002	0.0008	-0.0025
	(-1.28)	(0.14)	(0.28)	(-0.84)
Widowed	0.044	-0.009	0.0031	0.0321
	(1.01)	(-0.18)	(0.04)	(0.39)
Divorced/Separated	-0.0682	0.0716	-0.1053*	0.1239**
	(-1.63)	(1.47)	(-1.98)	(2.01)
Main resp. has schooling	0.0151	0.0258	0.0503*	-0.0292
	(0.62)	-0.77	(1.86)	(-0.73)

Main resp. currently attends school	0.0054	0.007	0.0283	-0.0242
	(0.06)	(0.06)	(0.25)	(-0.17)

Household Characteristics:
Monthly Per Capita Total Expenditure

(in usd)	0.0008	0.0004	0	0.0009
	(1.20)	(0.45)	(-0.01)	(1.34)
HFIAS Score	-0.0012	0.0034	-0.0027*	0.0072**
	(-0.75)	(1.53)	(-1.81)	(2.46)
% households that have suffered from a shock	-0.0236	0.0223	-0.0363	0.0528
	(-0.75)	(0.55)	(-1.22)	(1.36)
% households affected by flood	-0.007	-0.0491	-0.0493	-0.0113
	(-0.09)	(-0.57)	(-0.63)	(-0.13)
% households affected by drought	0.005	-0.0373	0.0201	-0.0558
	(0.20)	(-1.25)	(0.51)	(-1.27)
_cons	0.3323***		0.3432***	
	(4.37)		(2.68)	
N	3046		3046	
adj. R-sq	0.0221		0.0228	

* p<0.10 **p<0.05 *** p<0.01

Notes: Linear probability estimates of probability of attrition at follow-up. Column (1) reports coefficient of variable shown in the first column; Column (2) shows coefficient of that same variable interacted with the treatment dummy. Columns (3) and (4) provide results of the same analysis using standardized weights. Clustered t-statistics shown in parentheses below coefficients.

Table B.2. Baseline Mean Characteristics of Panel Households - by Same/Different Main Respondent

	Same Respondent both periods		Different Main Respondent at followup		*p*-Value: Comparing both groups
	Mean	Std. Error	Mean	Std. Error	
Household Demographics:					
Household Size	4.68	0.110	6.12	0.185	0.000
# Children under 5	0.71	0.034	0.95	0.072	0.001

# Children 6-17	2.06	0.066	2.69	0.113	0.000
# Adults 18 - 59	1.08	0.042	1.60	0.095	0.000
# Elderly (>60)	0.83	0.026	0.88	0.050	0.309
% households that have disabled members	26.26	0.015	25.39	0.022	0.762
% households that have chronically ill members	36.01	0.013	39.78	0.022	0.105
% households that have elderly members	65.89	0.017	60.01	0.035	0.095
% households categorized as labor constrained	84.99	0.010	80.02	0.021	0.021
Main Respondent Characteristics:					
% Female	73.98	0.013	52.82	0.023	0.000
Age	58.02	0.813	51.80	0.992	0.000
% Widowed	42.95	0.017	20.70	0.017	0.000
% Divorced/Separated	9.94	0.009	6.81	0.014	0.024
% Main resp. has schooling	54.18	0.017	66.33	0.028	0.000
% Main resp. currently attends school	1.06	0.003	2.94	0.007	0.019
Highest grade of Main resp.	3.08	0.120	4.12	0.151	0.000
Household Characteristics:					
Monthly Per Capita Total Expenditure (in usd)	34.48	1.321	29.43	1.180	0.002
Monthly Per capita Food Expenditure (in usd)	21.71	0.983	19.24	1.071	0.070
HFIAS Score	14.14	0.227	13.55	0.400	0.152
# of shocks experienced	2.58	0.129	2.72	0.102	0.244
% households that have suffered from a shock	88.64	0.014	89.59	0.014	0.553
% households where death has occurred in 12 mo	9.12	0.006	11.69	0.019	0.215
# of livestock type	2.09	0.060	2.61	0.106	0.000
% households that receive wages	9.65	0.009	12.74	0.018	0.103
% households undertaking casual/maricho labor	43.47	0.017	56.63	0.034	0.000
Aid received (in USD)	59.28	4.889	65.73	7.023	0.243
Distance to Food Market	3.75	0.242	3.61	0.252	0.594
Distance to Input Market	19.17	1.211	19.39	1.691	0.862
Distance to Water	1.25	0.084	1.59	0.149	0.001
N	2005		623		

Notes: Attrition-adjusted weighted results.

Table B.3. Baseline Mean Characteristics of Same Respondent Households - by T & C

	Comparison Group		Treatment Group		p-Value: Comparing both groups
	Mean	Std. Error	Mean	Std. Error	
Household Demographics:					
Household Size	4.72	0.191	4.67	0.134	0.819
# Children under 5	0.75	0.057	0.70	0.041	0.476
# Children 6-17	2.03	0.125	2.07	0.078	0.766
# Adults 18 - 59	1.12	0.070	1.07	0.052	0.589
# Elderly (>60)	0.82	0.049	0.83	0.030	0.890
% households that have disabled members	28.36	0.031	25.43	0.017	0.401
% households that have chronically ill members	35.73	0.025	36.11	0.015	0.893
% households that have elderly members	66.62	0.030	65.60	0.021	0.779
% households categorized as labor constrained	85.03	0.016	84.97	0.012	0.983
Main Respondent Characteristics:					
% Female	72.66	0.028	74.50	0.015	0.558
Age	58.18	1.547	57.96	0.955	0.892
% Widowed	44.27	0.023	42.43	0.022	0.563
% Divorced/Separated	10.18	0.013	9.85	0.011	0.843
% Main resp. has schooling	58.48	0.030	52.50	0.021	0.107
% Main resp. currently attends school	0.38	0.003	1.33	0.004	**0.040**
Highest grade of Main resp.	3.22	0.176	3.02	0.153	0.394
Household Characteristics:					
Monthly Per Capita Total Expenditure (in usd)	36.24	3.357	33.79	1.282	0.499
Monthly Per capita Food Expenditure (in usd)	22.66	2.417	21.33	0.988	0.613
HFIAS Score	13.77	0.478	14.29	0.253	0.344
# of shocks experienced	2.30	0.222	2.69	0.151	0.147
% households that have suffered from a shock	84.72	0.030	90.18	0.014	0.106
% households where death has occurred in 12 mo	8.35	0.010	9.42	0.008	0.405
# of livestock type	2.08	0.075	2.10	0.079	0.868
% households that receive wages	9.54	0.014	9.70	0.011	0.931
% households undertaking casual/maricho labor	45.90	0.037	42.52	0.018	0.416
Aid received (in USD)	75.34	13.700	52.97	3.714	0.119

Distance to Food Market	3.49	0.585	3.85	0.249	0.564
Distance to Input Market	19.74	2.181	18.95	1.453	0.765
Distance to Water	1.25	0.191	1.25	0.089	0.998
N	654		1352		

Notes: Attrition-adjusted weighted results.