The Impact of an Unconditional Cash Transfer on Early Child Development: The Zambia Child Grant Program

Authors:

David Seidenfeld - American Institutes for Research (AIR)

Sudanshu Handa – University of North Carolina (UNC)

Leah Prencipe - AIR

Laura Hawkinson - AIR

Abstract

Over three dozen countries including the United States now implement large scale cash transfer programs to alleviate poverty. Early programs in South America provided money to poor families conditional on their sending children to school or bringing them to health centers on a regular basis. In more recent years, several countries in Africa have begun to implement unconditional cash transfer (UCT) programs, including Zambia, South Africa, Kenya, and Zimbabwe. A growing body of evidence suggests that both conditional and unconditional cash transfer programs have positive impacts on poverty reduction, improved health and nutrition, and increased food security. However, surprisingly little is known about how UCTs impact child development among young children.

Early childhood refers to the formative part of development from conception to eight years of age. Much cognitive, social, emotional and physical development occurs during this critical period. Biological and social events during the first few years of life can affect future outcomes, such as school achievements, attendance rates, and even economic productivity later in life. Cash transfers may influence early childhood development by freeing up money and time which would have otherwise been spent on food purchases and extra labor to provide basic necessities. Caregivers can now allocate these resources for educational materials and learning activities.

The Child Grant Program is one of the Government of Zambia's largest social protection programs. The program provides a monthly cash payment of 60 kwacha (U.S. $12) to poor households with children under five years old. We implemented a randomized control trial with 2,515 households to investigate the impact of the program on a range of protective and productive outcomes. The study includes over 3,000 children aged 3-7, one of the largest longitudinal samples of young children in a cash transfer evaluation, that allows us to estimate effects of the program on early childhood development (ECD) outcomes. We measured child developmental outcomes and included a number of ECD support indicators such as availability of learning materials, adult support for learning and school readiness, non-adult care, and pre-school attendance, the first time these indicators are studied in an evaluation of a cash transfer program in Africa. We selected ECD indicators from UNICEF's Multiple Indicator Cluster Survey (MICS). The MICS has been conducted in over 100 countries over the last 20 years. Thus, our study uses internationally validated indicators that can be compared to other ECD studies around the world.

We find that cash transfers improve several ECD measures after 24 months of program implementation including owning three or more books, adult activities of support for learning, and a child's ability to

follow directions. These results remain in both large and small households, as well as with high and low educated mothers, demonstrating that UCTs can improve parental support for learning through increased engagement with children. However, we find more and larger effects for larger households even though the transfer size is the same regardless of household size. Having more household members may mean that there are more adult members available to engage with children in learning and stimulation activities. The positive effects of the CGP program provide evidence that funding UCT programs that target poor, rural households also improve children's critical period of growth, setting the foundation for improved educational outcomes and productivity later in life.

Introduction

Many children in developing countries are subject to a number of risk factors— poverty, malnutrition, illness, and lack of stimulation —which can impede cognitive, motor, and social-emotional development during the critical period of early childhood (Grantham-McGregor, et al., 2007). Early childhood refers to the formative part of development from conception to eight years of age (Irwin, Siddiqi, & Hertzman, 2007). Biological and social events during the first few years of life can affect future outcomes, such as school achievements, attendance rates, and even economic productivity later in life (Engle, et al., 2007). With such long lasting effects, the key question is what policy instruments are available to governments to support early child development. This article presents results from one such possible instrument, the Zambian Child Grant Program (CGP).

The environments to which children are exposed shape their early childhood development. Social intervention programs often aim to improve household environments, so that those environments will help improve ECD (Irwin et al. 2007). Conditional cash transfer (CCT) programs have a track record of increasing cognitive learning abilities and improving health by improving nutrition and increasing access to health services (Macours, Schady, & Vakis, 2008) (Fernald, Gertler, & Neufeld, 2008). However, little research has been conducted on unconditional cash transfers despite their growing prevalence in Africa including South Africa, Zambia, Zimbabwe, Kenya, Malawi, Lesotho, and Uganda. Undirected by the strong incentive structure put in place by CCT programs, UCT programs have a considerable structural difference, and therefore patterns of understanding ECD outcomes from CCT intervention are not necessarily directly applicable to UCT programs. Research is needed to understand if and how unconditional cash transfer programs impact early childhood development outcomes.

Unconditional cash transfers do not necessarily have a direct mechanism to affect early child outcomes. In conditional programs the cash transfer is tied to specific family behaviors that can improve child development, such as taking their child to the clinic for regular check-ups. Nonetheless, UCT programs have the potential to affect child developmental outcomes indirectly if the cash transfer impacts family behaviors that improve child outcomes. The impact of a UCT program on child nutrition depends on both the size of the transfer and household consumption patterns. UCTs do, however, have the ability to free up caregiver time and resources previously allocated to basic needs such maintaining an adequate livelihood. In a report on ECD, the World Health Organization noted a worldwide imbalance between maintaining adequate resources for the family and family care/time itself. In developing countries, children are frequently left at home alone or with siblings thus limiting the cognitive and social

development potential attached to spending time with adults (Irwin et al., 2007). If UCTs free up parental time and resources to be reoriented towards children, parents may provide more stimulation and support for learning in their interactions with children.

We implemented a randomized control trial with 2,514 households to investigate the impact of the child grant program on a range of protective and productive outcomes. The study includes over 3,000 children aged 3-7, one of the largest longitudinal samples of young children in a cash transfer evaluation, that allows us to estimate effects of the program on early childhood development (ECD) outcomes. We included a number of ECD indicators such as availability of learning materials, adult support for learning and school readiness, non-adult care, and pre-school attendance, the first time these indicators are studied in an evaluation of a cash transfer program in Africa. We selected ECD indicators from UNICEF's Multiple Indicator Cluster Survey (MICS). The MICS has been conducted in over 100 countries over the last 20 years. Thus, our study uses internationally validated indicators that can be compared to other ECD studies around the world.

The Child Grant Program
In 2010, Zambia's Ministry of Community Development, Mother and Child Health (MCDMCH) started the rollout of the CGP in three districts with the highest rates of child mortality and poverty: Kaputa, located in Northern Province; Shongombo, located in Western Province; and Kalabo, also located in Western Province. All three districts are near the Zambian border with either the Democratic Republic of Congo (Kaputa) or Angola (Shongombo and Kalabo). These districts represent some of the most remote locations in Zambia, making them a challenge for providing social services, and are some of the most underprivileged communities in Zambia. The CGP is a categorically targeted program--any household within the district with a child under 5 years old is eligible. Recipient households receive 60 kwacha (ZMW) per month (equivalent to U.S. $12) irrespective of household size, an amount deemed sufficient by the MCDMCH to purchase one meal a day for everyone in the household for one month. The goal of the CGP is to reduce extreme poverty and the intergenerational transfer of poverty through five primary areas: income, education, health, food security, and livelihoods. Payments are made every other month through a local pay point manager, and there are no conditions to receive the money. In the initial phase of the program, only households with children under age three were enrolled to ensure that every recipient household would receive the transfers for at least two years.

Evaluation Study Design
The CGP impact evaluation randomized communities into treatment and control groups to estimate the effects of the program on recipients. Ninety communities designated by Community Welfare Assistance Committees (CWACs) were randomly selected (out of 300) to be in the study sample. Then these 90 CWACs were randomly assigned to either the treatment condition (45 CWACs) to start the program in December 2010 or to the control condition (45 CWACs). Randomization occurred within each of the three study districts. We collected baseline data in October 2010 (prior to households in the treatment arm entering the program) and a 24-month follow-up survey in October 2012.

Study Sample and Baseline Equivalence

The evaluation study contains a sample of 2,514 households, with 14,565 people, almost all of whom live below the extreme poverty line (95 percent). Almost one-third (4,793) of the sampled individuals are children under age 5, with the largest number under one year old (1,427), making the study unique for cash transfer evaluations in Africa—the sample has the largest proportion of children in this age range. This very young study sample is also exciting given the increased recognition of the importance of the first 1000 days of life for a child's future development. Among the recipients, 99 percent are female and among children under five years old, half are female.

Not only is the sample comprised of a large number of children, but these households are also very poor. At baseline, the average household has 5.7 household members spending approximately 40 kwacha (U.S. $8) per person per month. This is equivalent to approximately 26 cents a day per person. Additionally, only five percent of households have a roof made of purchased material and only three percent have a floor made of purchased materials. The maternal education level is only four years for these households, meaning that, on average, the mothers in the sample have not graduated from primary school.

Our comparison of control and treatment groups at baseline finds that randomization created equivalent groups for the CGP evaluation. Table 1 shows the summary statistics by treatment group at baseline for households and recipient level indicators, and table 2 shows the summary statistics for child characteristics in children aged three to seven years.

Table 1: Household Level Comparisons at Baseline

Variables	Treatment		Control		Mean Diff	p-value
	Mean	N1	Mean	N2		
Household size	5.632	1,259	5.757	1,260	0.125	0.468
Total monthly expenditure per capita (ZMK)	39.476	1,259	41.376	1,260	1.900	0.470
Roof made of purchased material	0.061	1,258	0.047	1,258	-0.014	0.349
Floor made of purchased material	0.031	1,254	0.028	1,250	-0.003	0.776
Wall made of purchased material	0.317	1,257	0.316	1,258	-0.001	0.991
Uses purchased material for cooking	0.051	1,256	0.050	1,258	-0.001	0.968
Main cooking device is purchased	0.030	1,235	0.046	1,226	0.017	0.369
Uses purchased material for lighting	0.574	1,075	0.581	1,123	0.007	0.910
Maternal education level (0-12)	3.792	1,259	4.320	1,260	0.527	0.077

Notes: Diff is the average difference between CGP households and control households, and SE is the standard error of this difference clustered at the CWAC level.

Table 2: Young Child Characteristics at Baseline (ages 3-7)

	Treatment	Control	Mean	p-value

Variables	Mean	N1	Mean	N2	Diff	
Age	4.855	1,527	4.915	1,486	0.060	0.279
Percent Female	0.496	1,505	0.518	1,464	0.023	0.225
Owns 3 or more books	0.014	1,394	0.016	1,378	0.002	0.789
Owns any books	0.067	1,394	0.093	1,378	0.025	0.148
Support for learning: Number of activities (0-6)	2.736	1,397	2.561	1,370	-0.175	0.311
Follows Directions	0.660	1,393	0.624	1,360	-0.035	0.333
Works independently	0.464	1,391	0.479	1,364	0.016	0.672
Language/cognition abilities: Number of skills (0-3)	0.357	1,372	0.422	1,361	0.065	0.232

Notes: Diff is the average difference between CGP households and control households, and SE is the standard error of this difference clustered at the CWAC level.

Ninety-one percent of the households from baseline remain in the 24-month follow-up sample. We investigate attrition at the 24-month follow-up by testing for similarities at baseline between (1) treatment and control groups for all non-missing households (differential attrition) and (2) all households at baseline and the remaining households at the 24-month follow-up (overall attrition). Testing these groups on baseline characteristics can assess whether the benefits of randomization are preserved at follow-up. Fortunately, we do not find any significant differential attrition at the 24-month follow-up, meaning that we preserve the benefits of randomization. We find small differences between the study population at baseline and those that remain at the 24-month follow-up; the remaining households are less likely to have experienced a shock, especially flooding or drought at baseline, and they consume a higher proportion of maize over cassava. The remaining sample at 24-month-follow-up is likely more similar to populations throughout Zambia because most of the missing households from the study depend on a lake that is drying up for their livelihood, a characteristic less common throughout the country. The study's generalizability (external validity) likely has increased with the study population at the 24-month follow-up because the remaining sample is more similar to the general rural population in Zambia where the program might be scaled.

Data and Measures
The ECD measures in this study are survey items reported by the primary cash transfer recipient during wave 2 of the Child Grant Program impact evaluation, which 95 percent of the time is the female head of household. Trained enumerators collected the data by conducting interviews in the family home. The ECD survey items were drawn from the Multiple Indicator Cluster Survey, Round 4 (MICS4). The MICS is an international household survey initiative developed by UNICEF to assist countries worldwide in gathering and analyzing data on family and child well-being. The child development indicators were developed for the third round of the MICS and refined in the MICS4, and include measures of access to learning materials, learning supports offered to children, care adequacy, participation in early childhood education, and an early child development index that measures child developmental skills in multiple domains of learning. In this paper, we report on two measures of family behaviors or resources that may improve child learning (books in the home and support for learning), and three measures of child developmental outcomes derived from the child development index (language/cognition abilities, following directions, working independently).

Books in home. The MICS4 survey includes an item measuring the number of children's books or picture books the family has for the child. We operationalized this outcome measure in two ways: whether the family owns 3 or more books, and whether the family owns any books. As shown in table 2, owning children's books was extremely rare among families in the study sample at baseline.

Support for learning. The support for learning scale measures activities an adult had conducted with the child within the three days before the survey. The scale ranges from 0 to 6, and is a count of positive responses to six binary activity indicators from the MICS4: 1) read with child; 2) told stories to child; 3) sang songs with child; 4) took child outside; 5) played with child; and 6) counted or drew things with child. The support for learning indicator has high internal consistency for children 1 the three to seven age group (α=.81) and the alpha would not improve by removing any of the indicators. On average, families at baseline reported doing just fewer than three of these activities with young children in the past three days (Table 2).

Language/cognition abilities. The language/cognition abilities scale is a count of language and cognitive skills exhibited by young children, as reported by the primary cash transfer recipient. The scale ranges from 0 to 3, and the skills include: letter recognition, word recognition, and number recognition. The language/ cognition abilities scale has good internal consistency for children in the three to seven age group (α=.78). Table 2 shows that young children in the baseline sample exhibited fewer than one of these skills on average.

Following directions. The MICS4 child development index includes an item asking if the child follows simple directions on how to do something correctly. The following-directions child outcome measure is a binary indicator of a positive response to this item.

Working independently. The MICS4 child development index includes an item asking when given something to do, if the child is able to do it independently. The working-independently child outcome measure is a binary indicator of a positive response to this item.

**Empirical Approach and Hypotheses**

This study reports on the effects of the program for ECD outcomes after two years of program implementation. We estimate program impacts on individuals and households using a differences-in-differences (DD) statistical model that compares change in outcomes between baseline and follow-up and between treatment and control groups. The DD estimator is the most commonly used estimation technique for impacts of cash transfer models and has been used, for example, in Mexico's Progresa program (Rawlings & Rubio, 2005) and Kenya's Cash Transfer for Orphans and Vulnerable Children (Kenya CT-OVC Evaluation Team, 2012). We use cluster-robust standard errors to account for the lack of independence across observations due to clustering of households within CWACs.[1] We use inverse probability weights to account for the nine percent attrition in the follow-up sample (Wooldridge, 2002).

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[1] http://www2.sas.com/proceedings/sugi23/Posters/p205.pdf

We also test for interactions of high maternal education level (five or more years) and large household size (greater than or equal to five members). Finally, we test each subsample for maternal education (high followed by low), followed by each subsample of household size (large followed by small).

We briefly sketch out the pathways for the intervention to lead to desired outcomes, including early child development. The CGP provides an unconditional cash transfer to households with a child under age five. CGP-eligible households are extremely poor, with 95 percent falling below the national extreme poverty line and having a median household per-capita daily food consumption of ZMW 1.05, or approximately 20 U.S. cents. Among households at such low levels of consumption, the marginal propensity to consume will be almost 100 percent; that is, they will spend all of any additional income rather than save it. Thus, we expect the immediate impact of the program will be to raise spending levels, particularly basic spending needs for food, clothing and shelter. The next step in the causal chain is the effect on children. It is important to recognize that any potential impact of the program on children, including early child development outcomes, must work through the household by its effect on spending or time allocation decisions (including use of services). The link between the household and children can be moderated by household-level characteristics themselves, such as the mother's education or household size. The impact of the cash transfer may be weaker or stronger depending on these conditions; thus, we analyze heterogeneous treatment effects on children by these moderating conditions. Figure 1 shows the pathways for how the intervention might lead to early child development, as well as other desired outcomes of the program. The diagram demonstrates the complexity of evaluating a cash transfer program due to the myriad potential pathways and impacts to investigate.

Figure 1: Conceptual Framework for Impact Evaluation of Child Grant Program
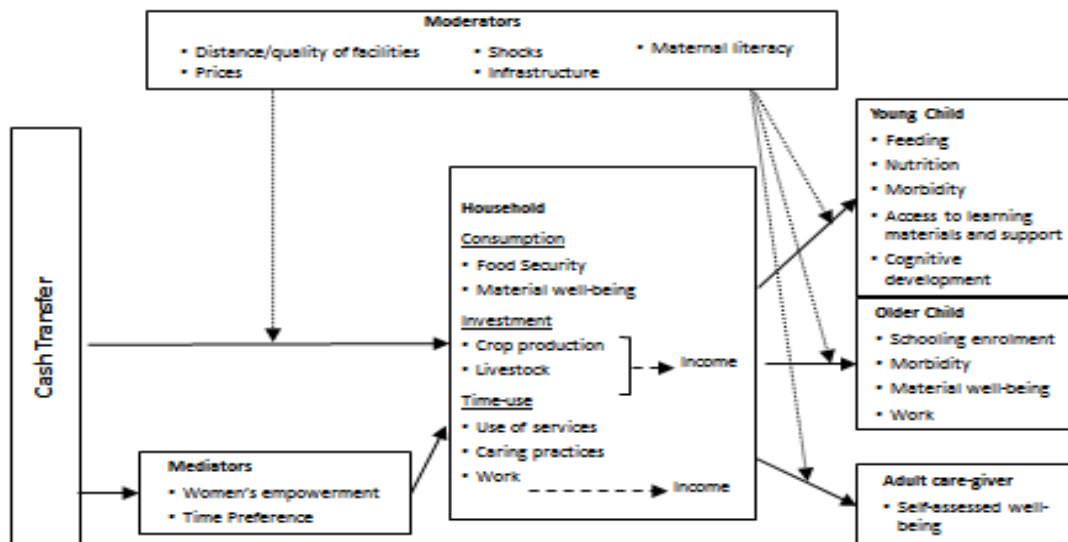
Results

We investigate the impact of the CGP on a number of ECD outcomes validated by the Multiple Indicator Survey from UNICEF[2]. Children's development is a second round outcome because it requires several behavioral responses in addition to spending the transfer to induce impacts on these outcomes. These behavioral responses can also be influenced by moderators in the household. Therefore, we examine the outcomes on the full sample, and then we analyze separately for large households (five or more household members) and small households (less than five household members), then for households with high maternal education (five or more years of education) and low maternal education (less than 5 years of education), and finally for female and male children. These sub categories were chosen for further analysis because material and social support for learning, as well as behavioral and cognitive outcomes can be affected by these moderators. Maternal education has been linked to better parenting behavior and support (Paxson & Schady, 2007), and a number of studies have shown disparities in education outcomes between boys and girls. Furthermore, support for learning, whether material or social, could potentially be affected by household size (availability of funds and number of adults and children for engagement in learning activities).

We find that the program increases the number of households with three or more books by 1.5 percentage points, from 1.5 percent of households to three percent of households. This effect holds for all subgroups except for small households. Children who grow up in households where books are available are likely to receive, on average, three more years of schooling than children from homes with no books. This relationship holds regardless of a caregiver's level of education, occupation or class, and it applies to rich and poor countries alike (Evans, Kelley, Sikora, & Treiman, 2010). However we find no impact on the number of households that own at least one book. Thus, it seems that households who already own at least one book end up using the transfer to purchase more books, while the program has no effect on those who do not own any books prior to receiving the grant.

Children's development is affected by the support provided in the household through active involvement of parents and other caregivers in learning and stimulating activities (UNICEF, 2012). The activities that adults participate with children to support learning include reading, telling stories, playing, singing, taking outside of household, yard, or enclosure, and counting, drawing, or naming things. The support for learning indicators were summed to create a scale from 0-6, with one point for each activity that an adult aged 15 or over participated with the child. The CGP impacts the support for learning scale by 0.497, meaning that the CGP households have nearly .5 more activities attributable to the program than non-CGP households. This impact is driven by large households, as well as for male children. However, both high and low maternal education levels show impacts, suggesting that the program increases learning activities in CGP households regardless of the mother's education level.

We also asked the caregiver several questions regarding the child's behavior. For the full sample, the CGP impacts the child's ability to follow directions by 10.5 percentage points, with 65 percent of children in beneficiary households following directions. These results are driven by small households,

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[2] The full list of ECD outcomes from UNICEF can be found at http://www.childinfo.org/mics5_questionnaire.html

households with high maternal education, and for males only. There are no impacts on the child's ability to work independently.

The language and cognition scale is made up of three questions that rate certain abilities of the child. These questions investigate whether the child can identify or name at least ten letters of the alphabet, can read at least four simple, popular words, and whether the child knows the name and recognizes the symbol of all numbers from 1 to 10. There were no program impacts on the language cognition scale, although effects on cognition and language development may be longer term than the material and social support outcomes, or the behavioral outcomes.

Table 3: CGP Impacts on ECD

Dependent Variable	Program Impact (1)	Baseline Mean (2)	24M Treated Mean (3)	24M Control Mean (4)
Owns 3 or more books	**0.015**	0.015	0.028	0.010
	(2.639)			
Owns any books	0.014	0.080	0.110	0.066
	(0.570)			
Support for learning: Number of activities (0-6)	**0.497**	2.656	2.413	2.087
	(2.367)			
Follows Directions	**0.105**	0.640	0.652	0.592
	(2.048)			
Works independently	0.053	0.470	0.485	0.432
	(1.030)			
Language/cognition abilities: Number of skills (0-3)	0.071	0.389	0.490	0.373
	(0.790)			
N	5,770	2,716	1,522	1,532

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition and a vector of cluster-level prices.

Table 4: CGP Impacts on ECD by subgroup

	Small HH		Large HH		Low Maternal Education		High Maternal Education		Females		Males	
	Program Impact (3)	Baseline Mean (4)	Program Impact (5)	Baseline Mean (6)	Program Impact (3)	Baseline Mean (4)	Program Impact (5)	Baseline Mean (6)	Program Impact (3)	Baseline Mean (4)	Program Impact (5)	Baseline Mean (6)
Owns 3 or more books	0.007 (1.040)	0.014	**0.016** (2.118)	0.016	**0.016** (2.910)	0.010	0.014 (1.300)	0.027	0.014 (1.977)	0.016	**0.014** (2.104)	0.016
Owns any books	0.007 (0.222)	0.073	0.015 (0.484)	0.084	0.002 (0.075)	0.070	0.044 (1.074)	0.099	0.017 (0.681)	0.079	0.014 (0.430)	0.081
Support for learning: Number of activities (0-6)	0.329 (1.166)	2.675	**0.614** (2.683)	2.646	**0.451** (2.005)	2.572	**0.574** (2.138)	2.819	0.465 (1.900)	2.680	**0.520** (2.264)	2.631
Follows Directions	**0.142** (2.146)	0.645	0.076 (1.357)	0.638	0.076 (1.333)	0.627	**0.141** (2.329)	0.665	0.090 (1.594)	0.655	**0.119** (2.093)	0.625
Works independently	0.077 (1.093)	0.446	0.036 (0.615)	0.483	0.039 (0.708)	0.462	0.070 (0.916)	0.486	0.036 (0.653)	0.477	0.074 (1.205)	0.463
Language/cognition abilities: Number of activities (0-3)	0.125 (1.009)	0.347	0.039 (0.446)	0.411	0.153 (1.818)	0.305	-0.071 (-0.544)	0.554	0.046 (0.453)	0.394	0.090 (0.922)	0.385
N	2,265	911	3,505	1,805	3,750	1,792	2,020	924	2,930	1,373	2,840	1,343

NOTE: Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for household size, recipient age, education and marital status, districts, household demographic composition and a vector of cluster-level prices.

Discussion and Conclusion

This study is the first to investigate the impact of receiving cash through an unconditional SCT on ECD outcomes in Africa. Additionally, the rigorous evaluation design and successful implementation of a randomized control trial without attrition bias provides strong internal validity to the results and enables us to attribute observed impacts to the program. We find that cash transfers improve several ECD measures after 24 months of program implementation including owning three or more books, adult activities of support for learning, and a child's ability to follow directions. We find more and larger effects for larger households even though the transfer size is the same regardless of household size. Having more household members may mean that there are more adult members available to engage with children in learning and stimulation activities.

Unconditional cash transfer programs are a popular mechanism in Africa to reduce food insecurity, break the intergenerational transfer of poverty, and protect vulnerable households from shocks such as drought. The rigorous evidence about UCTs in Africa shows that these programs can have strong impacts on an array of outcomes including increased food security, diet diversity, improved living conditions, hygiene and sanitation, increased productivity, and even spillover effects for non-beneficiaries living in the same community. However, until now there was no evidence about how the program might affect early childhood development, arguably the most critical developmental time in a person's life. If cash transfers can improve a person's early childhood development, then the benefits of the program extend well beyond the period of receiving cash, making the program much more valuable than estimated through just looking at the usual protective and productive impacts mentioned above. This study provides some of the first evidence that unconditional cash transfers can affect a person's early childhood development. The results presented here are limited by the relatively small breadth and depth of the ECD investigation, since it was not the primary purpose of the survey that collected the data. Therefore, this study suggests that there is reason to believe that UCTs can affect early child development and more research should pursue this line of inquiry. From a policy perspective, the evidence showing that UCTs can affect child development means that the benefits from UCTs might be much greater and impact beneficiaries' lives much longer than previously estimated, making UCT programs that much more cost effective.

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