Published in final edited form as:

Prev Sci. 2016 January ; 17(1): 134–143. doi:10.1007/s11121-015-0580-9.

Applying a Family-Level Economic Strengthening Intervention to Improve Education and Health-Related Outcomes of School-going AIDS-Orphaned Children: Lessons from a Randomized Experiment in Southern Uganda

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Abstract

Children comprise the largest proportion of the population in sub-Saharan Africa. Of these, millions are orphaned. Orphanhood increases the likelihood of growing up in poverty, dropping

Research involving Human Participants and/or Animals

- 1) Statement of Human Rights.

Ethical Approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

- 2) Statement on the Welfare of Animals

N/A.

Informed consent: Informed consent was obtained from all individual participants included in the study.”

Disclosure of potential conflicts of interest

The authors declare that they have no conflict of interest.

out of school, and becoming infected with HIV. Therefore, programs aimed at securing a healthy developmental trajectory for these orphaned children are desperately needed. We conducted a two-arm cluster-randomized controlled trial to evaluate the effectiveness of a family-level economic strengthening intervention with regard to school-attendance, school grades, and self-esteem in AIDS-orphaned adolescents aged 12–16 years from 10 public rural primary schools in southern Uganda. Children were randomly assigned to receive usual care (counseling, school uniforms, school lunch, notebooks and textbooks), “bolstered” with mentorship from a near-peer (control condition, $n=167$), or to receive bolstered usual care plus a family-level economic strengthening intervention in the form of a matched Child Savings Account (Suubi-Maka treatment arm, $n = 179$). The two groups did not differ at baseline, but 24-months later, children in the Suubi-Maka treatment arm reported significantly better educational outcomes, lower levels of hopelessness, and higher levels of self-concept compared to participants in the control condition. Our study contributes to the ongoing debate on how to address the developmental impacts of the increasing numbers of orphaned, and vulnerable children and adolescents in sub-Saharan Africa, especially those affected by HIV/AIDS. Our findings indicate that innovative family-level economic strengthening programs, over and above bolstered usual care that includes psychosocial interventions for young people, may have positive developmental impacts related to education, health, and psychosocial functioning.

Keywords

orphaned and vulnerable children (OVC); family-level economic strengthening; Child Savings Accounts (CSA); Suubi-Maka; HIV/AIDS; Sub-Saharan Africa

INTRODUCTION

Developing regions across the globe are experiencing a youth bulge: the largest proportions of their populations are young people ages 5 to 24 years (UNICEF, 2012). For developing countries to register maximum socioeconomic benefits from the youth bulge, they will have to invest in human capital development, including education (Eastwood & Lipton, 2011; Lutz & Samir, 2011; Ssewamala, 2014). In addition to the importance of education and its role in economic growth, including development of a skilled labor force (Barro, 2013; Bloom, Canning, & Chan, 2006), education is a protective factor for healthy adolescent and youth development (Santelli, Lowry, Brener, & Robin, 2000; Shann et al., 2013). For example, in sub-Saharan Africa, a region heavily affected by HIV/AIDS, adolescents who complete secondary school are at a lower risk of HIV infection (Hargreaves & Glynn; 2002), and are more likely to practice safe sex compared to adolescents who complete only the primary level (Hargreaves & Boler, 2006).

The importance of education for individual- and national-level development was reinforced when the global community endorsed the Millennium Development Goals, in particular, goal #2, “Education for All” (UNICEF, 2012). Following these goals, several countries in sub-Saharan Africa, including Malawi, Uganda, Kenya, Tanzania, Ethiopia, Ghana, and recently, Namibia, passed Universal Primary Education (UPE) policies providing free primary education for all primary school-going children.

Educational disadvantage in relation to poverty and the orphan crisis in sub-Saharan Africa

Many children are still unable to attend and/or complete primary school, despite UPE policies. One main reason for this is poverty. Poverty affects a family's ability to physically care for children, as well as family stability, functioning, and psychosocial well-being (Foster, 2006; Ssewamala & Ismayilova, 2009). In sub-Saharan African countries, despite free primary education, many families cannot afford to send their children to school.

The magnitude of household resource constraints families endure, in terms of the number of children within their care, is also augmented by the increases in orphanhood and child vulnerability resulting from disease (including HIV/AIDS). Of the 34 million orphans in sub-Saharan Africa, over 11 million under the age of 15 have lost one or both parents to HIV/AIDS. Estimates predict this number will reach 20 million by 2016. This translates into approximately 15% to 25% of the total child population below age 15, in 12 sub-Saharan African countries (UNICEF, 2009).

Orphans account for a disproportionate amount of out-of-school youth. Orphans are less likely to be in school and more likely to fall behind when in school (Bicego, Rutstein, & Johnson, 2003; Case & Ardington, 2006; Ssewamala & Curley, 2006; UNAIDS, 2012). Even within the same household, there is evidence that orphans are less likely to be enrolled in school compared to non-orphans (Case, Paxson, & Ableidinger, 2004). One estimate suggests that orphans are approximately 13% less likely to attend school compared to their non-orphan counterparts (Monasch & Boerma, 2004). In Uganda, where nearly 14% of non-orphaned primary-school pupils stopped attending school at some point, the proportion of orphans missing a term was almost twice as high, at 27% (UNICEF, 2006). The difference was even greater in secondary school, with 43% of orphans missing an academic term compared to 16% of nonorphans (UNICEF, UNAIDS, WHO, & UNFPA, 2009).

There are many reasons orphans, especially those orphaned as a result of HIV/AIDS, experience greater educational disadvantage, with household economic instability or poverty, being key. When a parent falls ill in a resource-constrained household, money may be diverted from education to cover medical costs. There may also be competing demands on the adolescent's time, such as caring for an ill parent (Robson & Sylvester, 2007). After a parent dies, orphans may be taken out of school or fail to enroll in school so that they can contribute to household labor. Thus, for most orphans, the death of a parent has a psychological impact as well as direct financial implications, elevating their risk of living in poverty (Case, Paxson, & Ableidinger, 2004). A survey conducted in 10 countries in sub-Saharan Africa found that the most common difficulty of households caring for orphans was facilitating education-related expenses (UNICEF, 2006).

UPE policy in Uganda

Universal Primary Education was implemented as national policy in Uganda in 1997, after which primary school enrollment increased more than threefold: from 2.7 million in 1996 to 9.2 million in 2009 (Uganda Ministry of Finance, 2010). However, there is an ever-increasing number of out-of-school children and adolescents, as well as staggeringly

decreasing primary school completion rates, particularly among orphans (Ssewamala, Wang, Karimli, & Nabunya, 2011).

The Suubi-Maka economic strengthening intervention

Against that backdrop, there is a need for alternative programs (both private and public) to augment the current UPE policy in Uganda. To address this need, a new and innovative family-level economic strengthening intervention aimed at addressing poor families' resource constraints and addressing the existing gaps in education outcomes (primary school enrollment, completion, and post-primary school enrollment) was developed. The intervention, which is a partnership between local families and their children, civil society (faith-based institutions), the private sector (financial institutions), and government (public schools), is known as "Suubi-Maka" (*'hope for families'* in the Luganda language in Uganda).

For low-income young people in developing countries, participating in economic strengthening programs can be the springboard to better developmental outcomes. Helping young people accumulate modest financial assets (including savings) through financial inclusion and economic strengthening programming not only opens up economic opportunities (Claessens, 2006; Karlan & Morduch, 2009), but also affects youth behavior in positive ways (Ssewamala, Han, Neilands, Ismayilova, & Sperber, 2010; Ssewamala, Ismayilova, McKay, Sperber, Bannon, & Alicea, 2010; Ssewamala, Neilands, Waldfogel, & Ismayilova, 2012). Such opportunities can benefit young people for years to come.

The Suubi-Maka intervention has three key components: 1) promoting monetary savings for educational opportunities for children. 2) financial management workshops and family-level income generating projects; and 3) providing mentors to children. The three intervention components are important for three reasons. First, because education has been shown to be a protective factor for mental health and psychosocial functioning. Second, because financial workshops are believed to enhance economic stability and reduce poverty. Third, because mentorship provides an ongoing caring relationship with a near peer, one of the most important sources for resilience in children (Garmezy, 1985).

We sought to evaluate the Suubi-Maka intervention with regard to addressing educational and health-related outcomes, specifically school-attendance, school grades, and self-esteem among poor AIDS-orphaned adolescents enrolled in UPE schools in Uganda. We hypothesized that the intervention would result in better developmental outcomes related to education, health, and psychosocial functioning. To test this hypothesis, we conducted a two-arm cluster- randomized controlled trial. The two study arms were: 1) the control condition (bolstered usual care) and 2) the treatment condition comprising of a family-level economic strengthening (i.e., Suubi-Maka treatment arm).

METHODS

Study sample

All participants enrolled in the study were AIDS-orphans in the last two years of primary school (12–16 years). Children were selected from 10 comparable public primary schools in

Rakai and Masaka Districts of southern Uganda, a community heavily affected by HIV/AIDS. All schools included in the study were part of the government supported UPE program. Before baseline, all schools were balanced on academic performance (using government-administered Primary Leaving Examinations [PLE], the national qualifying examination for admission into secondary school, the equivalent of high school in the U.S. education system). We screened 42 schools; 10 schools, at a comparable level of performance based on the previous three years of PLE grades prior to study initiation, were selected and invited to participate. The student population within the study schools came from families and villages with very similar socioeconomic backgrounds.

After baseline assessment, each of the 10 schools was randomly assigned to one of the two study conditions: Suubi-Maka (n=5 schools, 179 children) or bolstered usual care (n=5 schools, 167 children). All children from a particular school – meeting our inclusion criteria described above (AIDS-orphans in the last two years of primary school, 12–16 years) – received the same intervention. This was intended to address issues of potential contamination, but we also adjusted for clustering of individuals within schools by using multilevel analyses.

Consent and assent procedures

Participation in the study was voluntary. Written informed consent was obtained from the caregiver for each study participant and then in a separate step, a written informed assent form was obtained from each child who agreed to participate in the study. This was done prior to the baseline assessment. The processes for adult caregivers and youth was completely separate to avoid any coercion. All consent forms were translated into Luganda (the local language spoken in the study area) from English, and then back-translated into English by a translator from one of the local universities.

The study received IRB approval from Columbia University (AAAD2525) and Uganda National Council for Science and Technology (SS 1540). The study protocol is registered in the ClinicalTrials.gov database (ID# NCT01180114). Data were collected using surveys administered by trained Ugandan interviewers. All measures were translated from English to the local Luganda language, and back-translated to ensure accuracy.

Bolstered usual care (control)

All study participants received usual care for supported orphaned children in Uganda, which consisted of counseling, school uniforms, school lunch, notebooks and textbooks. In addition, usual care was bolstered with mentorship from a near-peer provided to each child enrolled in the study. The reason for bolstering usual care with mentorship was because nongovernmental organizations supporting orphaned children and adolescents are increasingly using mentorship as part of the “menu” for usual care. Thus, in order to standardize usual care for all enrolled participants, each child received the same dosage of mentorship, which was an average of one mentorship meeting per month for the 12-month intervention period.

Family-level economic strengthening: the Suubi-Maka intervention

Over and above receiving bolstered usual care, as part of the intervention, each child in the Suubi-Maka treatment condition was offered an opportunity to open a matched Child Savings Account (CSA). A CSA is a matched savings account held in the child's name in a recognized and registered financial institution in Uganda. The banks that hosted the Child Savings Accounts were: Centenary Rural Development Bank, DFCU Bank, and Kakuuto Microfinance. Any of the child's family members, relatives, or friends were encouraged to contribute toward the CSA. The account was then matched with money from the intervention program. The maximum amount of family contribution to be matched by the intervention program was an equivalent of US \$10 a month per family during the intervention period. In addition, participants received ten 1–2 hour microenterprise development workshops on starting family-based income-generating activities and financial management, including how to save money (see Karimli, Ssewamala and Neilands, 2014).

Measures

The following measures, except for taking of the Primary Leaving Examinations (PLE) and PLE score, were obtained at baseline (pre-intervention), and 24-months post-intervention.

Educational Outcomes

Taking of PLE: This dichotomous measure indicates whether a child took the PLE after the study began. At the end of seven years of primary schooling, each student in Uganda is examined on a standardized government-administered examination comprising four core subjects: English, Mathematics, Science, and Social Studies.

PLE Score: The actual PLE score is an aggregate measure of the four core PLE subjects. The PLE score ranges from 4 to 36. The lower the score, the better the performance.

Child's Confidence In Achieving Educational Plans: Children were asked how sure/confident they were that they would achieve their stated educational plans. The item responses ranged from 1 being the *lowest level of confidence* to 4 being the *highest level of confidence*. After participants were asked what their educational plans were, a sample follow-up question was: *How sure are you that you will achieve this educational plan?* Response categories included: a) very sure; b) moderately sure; c) a little sure; d) not at all sure. This variable was dichotomized into: highest level confidence children vs. other (a reference group).

Health Outcomes

Beck Hopelessness Scale: This scale consists of 20 items. Each item is a binary variable with two response categories (True/False). The total score is obtained by summing the score of the 20 items. The score ranges from 0 (no hopelessness) to 20 (absence of all hope). Examples of items on this scale include *I do everything wrong*; *I hate myself*. The measure has satisfactory internal consistency (Cronbach's $\alpha=0.68$ at baseline; and 0.70 at 24-month follow-up).

Tennessee Self-Concept Scale: The Tennessee Self-Concept Scale consists of 20 items. Each item is a categorical variable with five response categories ranging from 1 = “Always False” to 5 = “Always True.” The total score, obtained by summing-up the score of 20 items, ranges from 20 to 100. Examples of items on this scale include *I do not do well in school even when I try; It is hard for me to do what is right*. The higher score corresponds to a higher self-concept. The measure has strong internal consistency (Cronbach’s alpha was 0.74 at baseline, and 0.81 at 24-month follow-up).

Covariates—The following variables were considered covariates: child’s age and gender, the guardian’s age and gender, the number of children in the participant’s household, the child’s orphanhood status (double-orphan or single-orphan), financial support from the others (yes/no) as a proxy for the family’s poverty level, and the child’s self-reported physical health, a categorical variable with response categories 1 = “not good,” 2 = “good,” and 3 = “excellent.”

Data Analysis

Descriptive and Bivariate Analysis—To describe and examine the observable socioeconomic characteristics of the sample, and differences between the treatment arm and the control group, we used descriptive and bivariate analyses. Given the repeated-measures and clustered nature of data, differences in means for all continuous variables were tested using the `-svy lincom-` command in Stata 13. This command calculates the difference between means, the standard errors of the difference, t-value, and the pvalue taking into account clustering at school level in survey data.

Multivariate Analysis—To test the effect of the intervention on the child’s educational and health outcomes, we use multivariate regression analyses for each of the following outcomes at follow-up: (1) taking of Primary Leaving Examinations (PLE); (2) actual PLE score; (3) confidence in achieving educational plans; (4) Beck Hopelessness Scale, and (5) Tennessee Self-Concept Scale. The primary independent variable was intervention group assignment.

The command `xtmixed` in Stata 13 was used for the continuous PLE score, Beck Hopelessness Scale, and Tennessee Self-Concept Scale, and `melogit` for the binary outcome measures: PLE attendance and child’s confidence in achieving the stated educational plans. PLE score and PLE attendance both refer to the PLE test, taken by the child only once at the end of their primary education. Consequently, for these outcomes, there are no baseline-level measures. The other three outcome measures (Beck Hopelessness Scale, Tennessee Self-Concept Scale, and child’s confidence in educational plans) were measured both at baseline and postintervention. For these outcomes, we controlled for the baseline level measures.

To account for potential school effects, we included school ID as a random intercept term in the multilevel regression analyses. This allowed us to adequately control for potential correlation among children attending the same school. Specifically, for the main analysis, we used mixed-effects models with random intercept and robust standard errors.

In the random intercept models, to test for significance of school-level variance, we used the likelihood ratio test of the between-subject standard deviation. Finally, ICC (intraclass correlations) were calculated for each outcome of interest.

RESULTS

Descriptive Statistics

Measurements were taken at baseline (pre-intervention) for 346 children. After attrition, the final sample 24-months after the intervention was 317. The 29 participants lost to attrition were not statistically different on identifiable socioeconomic characteristics from those who remained in the study at follow-up.

At baseline, the average age of students enrolled in the study was 13.4 years. Female students were 65% of the sample. The guardians' average age was 45.7 years. Most guardians were female (79.5%). About 29% of the enrolled students reported having lost both biological parents (double orphans); the rest had lost one parent (single orphans). In regards to health, 25.4% of children reported being in excellent physical health and 45.4% reported being in good health. The average number of children per household was three. Approximately 44% of the enrolled guardians reported receiving financial support from other relatives and friends of the family, other than the child's primary caregiving family, perhaps indicating the level of poverty that characterized the families in which the children enrolled in the Suubi-Maka study lived. Indeed, in Uganda, with no public welfare system, it is not uncommon for distant relatives and friends in rural areas to pool their resources together to take care of poor, orphaned, and vulnerable children.

When asked how confident the students were in achieving their stated educational plans, 78.3% reported that they were very sure; hence, were categorized as those with the highest level of confidence in achieving their stated educational goals. At 24-month follow-up, 90.2% were in the highest level of confidence. Approximately 80% of the students enrolled in the study had taken the PLE by the 24-month follow-up period with an average score of 24.1 (range, 4 to 36) (Table 1).

The average Beck Hopelessness Scale score was 5.35 at baseline, and dropped to 3.26 at 24-month follow up, indicating a lower level of hopelessness. The average Tennessee Self-Concept Scale score was 78.4 at baseline, and rose to 84.2 at follow-up, corresponding to higher self-concept.

Results of Bivariate Analysis

Analysis of baseline differences between the treatment and control conditions showed no significant differences in all of the covariates included in the study, except for the child's orphanhood status. Students in the control group were more likely to report double-orphanhood status than those in the treatment group (Table 1). All of our models control for orphanhood status.

At 24-month follow-up, we found several significant differences in educational outcome indicators between the two groups. First, students in the treatment group were more likely to

have taken the PLE than were control students. Since all students in the study were in their last two years of primary school, by 24-month follow-up, they should all have taken the PLE. Any student who reported not taking the PLE by 24-month follow-up would either have dropped out of school or repeated a grade. By this measure, therefore, students in the treatment group were doing better than their counterparts in the control group. Second, students in the treatment group had lower PLE scores, indicating a better result (average score of 22.1 versus 26.9 for control students). The reported 4.8 aggregate score difference between the two groups places students in different divisions, and exposes the two groups to different education opportunities. Third, at baseline, there was no statistically significant difference between groups in their level of confidence to achieve their stated educational plans. By 24 months, however, there was a statistically significant difference ($p = .01$). Students in the treatment group had almost a 17-percentage point positive change in their level of confidence to achieve their stated educational plans (from 79.8% to 96.6%). The reported change among the control students was approximately a 5-percentage point change (from 76.5% to 81.4%).

Health outcomes also differed significantly between the two groups at follow up. Whereas at baseline, the two groups did not differ significantly for either the Beck Hopelessness Scale or the Tennessee Self-Concept Scale, at follow-up, children in the treatment group reported significantly lower levels of hopelessness than control children (2.7 versus 2.8 out of 20; $p = .01$), as well as significantly higher scores on the Tennessee Self-Concept Scale (85 versus 83.4 out of 100; $p = .05$).

Results of Multilevel Logistic Regression Analysis

Effect of the Suubi-Maka Intervention on Taking the Primary Leaving

Examinations (PLE)—Taking the PLE signifies an explicit desire and ability to proceed to post-primary schooling, including secondary schooling. As shown in Table 2, children in the Suubi-Maka intervention group were 7.16 times more likely to take the PLE than children in the control group ($p < .01$; 95% CI = 2.03, 25.29).

Gender was also significantly associated with taking the PLE; girls were 1.75 times more likely ($p < .01$; 95% CI = 1.21, 2.54) than boys to take the PLE. Traditional cultural practices in the geographic area of our study tend to discriminate against girls when it comes to education. These results indicate that when given the opportunity, girls can do just as well, if not better than their male counterparts.

Furthermore, guardian age and gender were significantly associated with taking the PLE. Children cared for by older guardians were 1.02 times more likely to take the PLE ($p < .001$; 95% CI = 1.01, 1.04) than children cared for by younger guardians. However, children cared for by female guardians were less likely to take the PLE (OR = 0.5; 95% CI = 0.31, 0.82; $p < .01$) than children cared for by male guardians. We are not sure what these findings regarding gender signify. Future studies may benefit from qualitative components in which researchers may conduct in-depth interviews and use financial diaries to understand the gender association.

Effect of the Suubi-Maka Intervention on Children's Confidence in Achieving Educational Plans—We examined the extent to which participation in the Suubi-Maka intervention influenced participants' level of confidence in achieving their educational plans. We found that children in the treatment group had much higher confidence in their educational plans than did their counterparts in the control group (OR = 6.06; 95% CI = 1.23, 29.91; $p < .05$). Also, children who, at baseline, reported having excellent physical health (OR = 4.35; 95% CI = 1.54, 12.26; $p < .01$) or good physical health (OR = 2.35; 95% CI = 1.16, 4.8; $p < .05$) had higher odds of being more confident in achieving their educational plans than children who reported having poor physical health.

Effect of the Suubi-Maka Intervention on Primary Leaving Examination Scores—We assessed the extent to which the Suubi-Maka intervention affected PLE scores as an academic performance measure (the lower the score, the better the performance). We found that participation in the intervention had a positive effect on academic performance (see Table 3). Specifically, there was a statistically significant relationship between program participation and PLE scores, with participants in the Suubi-Maka intervention group reporting better scores than their counterparts in the control group ($b = -5.53$, $p < .05$, CI: -11 , -0.1). Also, older students had poorer PLE scores than their younger counterparts ($b = 1.06$, $p < .001$, CI: 0.5, 1.6); and although girls were more likely to take the PLE, they had poorer scores than boys ($b = 1.48$, $p < .01$, CI: 0.5, 2.4) (Table 3).

Effects of the Suubi-Maka Intervention on Children's Hopelessness (Beck Hopelessness Scale)—At 24-month follow-up, children in the treatment group reported lower levels of hopelessness than their control counterparts ($b = -0.97$; $p < .01$, 95% CI = -1.7 ; -0.3). Additionally, compared to children who reported having poor physical health at baseline, children who indicated good physical health ($b = -0.64$; $p < .01$, 95% CI = -1 ; -0.2) reported lower levels of hopelessness. Older children reported higher hopelessness ($b = -0.16$; $p < .05$, 95% CI = 0.04; 0.3) than younger children. It could be that as poor orphaned children get older (and have greater family responsibility), they become more concerned about their economic status and how that would impact their future wellbeing, making them less hopeful.

Effects of the Suubi-Maka Intervention on Children's Self-Concept (Tennessee Self-Concept Scale)—Children in the treatment group reported a higher average self-concept than those in the control group ($b = 1.83$; $p < .001$, 95% CI = 0.8; 2.9). Moreover, girls reported higher levels of self-concept ($b = 3.3$ $p < .001$, 95% CI = 2; 4.6) than boys. Similarly, single orphans reported higher levels of self-concept ($b = 2.56$; $p < .01$, 95% CI = 0.9; 4.2) than double orphans. Finally, children whose guardians reported receiving financial support from other relatives (including friends of the family) reported higher levels of self-concept ($b = 2.55$; $p < .001$, 95% CI = 1.3; 3.8) than those whose guardians reported not receiving any financial support from other relatives.

DISCUSSION AND IMPLICATIONS

In this two-arm cluster-randomized controlled trial, we sought to evaluate an innovative family-level strengthening intervention with regard to school-attendance, school grades, and

self-esteem among poor AIDS-orphaned adolescents enrolled in UPE schools in Uganda. We hypothesized that the intervention would result in better developmental outcomes related to education, health, and psychosocial functioning. Our study results support this hypothesis.

Our findings point to several important implications for public health programming and practice. First, participation in family-level economic strengthening—offering, among other things, matched Child Savings Accounts to poor, orphaned, and vulnerable children—generates positive educational outcomes. Not only does this kind of programming increase the likelihood that children will attend and take the Primary Leaving Examination (PLE)—a key requirement for advancing to post-primary schooling in Uganda (and in many sub-Saharan African countries), but it also seems to have a positive effect on children's actual PLE scores. A high passing score is a necessary condition for being admitted to secondary school in Uganda and to obtain government support (or scholarships) through the Universal Secondary Education system. Our analyses showed that students who participated in the Suubi-Maka intervention had significantly better PLE scores (22.1 versus 26.9 for controls; lower score indicates a better result. In general, when admitting students to secondary school, government-supported schools in the study area tend to stop at a score of 24. By this measure, of the 270 participants who took their PLE by the 24-month follow-up, 34.4% who participated in the Suubi-Maka intervention qualified to join government-supported secondary schools, compared to 37 participants (13.6%) in the control group. The intervention therefore holds potential for significantly improving a child's educational prospects. This is an important finding, given the argument that both public and private returns to education are the highest at the primary level (Deininger, 2003) and in light of the United Nations Millennium Development Goals, especially around Goal #2, Education for All. Governments may want to consider the fact that addressing structural inequities, for example through family-level economic strengthening strategies, may be one of several complementary strategies for achieving Millennium Development Goal # 2.

In addition, our results indicate that the Suubi-Maka intervention boosted children's confidence in their educational plans. Several studies report a strong positive association between educational plans and aspirations, and children's educational attainment, including school completion (Beal & Crockett, 2010; Rethon, Arephim, Klineberg, & Cattell, 2011). Hence, by boosting children's confidence in their educational plans, the family-level economic strengthening intervention may play an important role in improving orphaned and vulnerable children's future attainments, including completion of primary school, and enrollment in and completion of secondary school.

Furthermore, our study shows that participation in family-level economic strengthening produced positive psychosocial and mental-health outcomes, including reduced hopelessness and improved self-concept among orphaned children involved in the study. This is an important contribution to the literature on determinants of psychological well-being of orphaned children and adolescents, especially AIDS-orphans in Africa because many scholars see positive self-concept as central for adaptive functioning of individuals – arguing that children with a low self-concept are more likely to have depression, teenage pregnancy, and difficulties forming sustaining social relationships (Butler & Gasson, 2005; Emler, 2001; Harter, 1993). Moreover, several studies show that AIDS-orphans have poorer

psychological well being, including lower self-esteem, compared to non-orphans (Bhargava, 2005; Chi & Li, 2013). The specific mechanisms through which the family-level economic empowerment intervention affects orphaned children and adolescents' hopelessness and self-concept warrant further study.

Our findings hold potentially important policy implications. Specifically, our results support the well-established argument for a strong relationship between a family's economic conditions and its children's educational outcomes (Deininger, 2003; Berger, Paxson, & Waldfogel, 2009; Waldfogel, Craigie, & Brooks-Gunn, 2010). Our findings are also consistent with previous research showing a positive association between asset accumulation in Child Savings Accounts and children's certainty about accomplishing their educational plans, as well as children's improved grades on Primary Leaving Examinations (Ssewamala & Ismayilova, 2009; Curley, Ssewamala & Han, 2010). In Uganda, despite the significant reduction in direct education-related costs after the adoption of Universal Primary Education—including tuition, other costs (which caregivers still have to bear—such as school lunch, uniforms, and scholastic materials) account for 55% of primary school dropouts (Nishimura, Yamano, & Sasaoka, 2008). Therefore, the family-level economic strengthening program we studied may have facilitated orphaned children's access to education by addressing the household's capacity to bear the additional costs of education beyond direct tuition, and thus, improve the family's capacity to invest in education.

Further research may uncover specific mechanisms through which participation in Child Savings Accounts affects children's outcomes. More specifically, it would be important to distinguish whether the effect of the intervention works through economic channels (i.e. having access to scholastic resources), through psychosocial factors (i.e. more parental involvement and support for the child, as a result of the family's improved economic situation), or whether the same or similar results may be achieved only through a combined economic and psychosocial program, such as the Suubi-Maka intervention. Answering these questions could improve the effectiveness of programs and policies aimed at harnessing the youth bulge in developing regions, especially for HIV/AIDS-affected, orphaned, and vulnerable children and adolescents living in poverty-impacted communities in sub-Saharan Africa.

Acknowledgements

The Suubi-Maka study was supported by the National Institute of Mental Health of the National Institutes of Health under Award Number R34MH081763-02 (PI, Fred Ssewamala). The content of this paper is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. The study received Institutional Review Board approval from Columbia University (AAAD2525) and the Uganda National Council for Science and Technology (SS 1540). The authors are grateful to Professors Jane Waldfogel at Columbia University and Mary McKay at New York University for their help with the study design; and Jennifer Nattabi, Rev. Fr. Joseph Kato Bakulu, and the Suubi-Maka Research Team in Uganda. The authors also thank the children and their caregiving families who participated in the study.

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Table 1

Descriptive and bivariate analyses of the sample

Variables	Total (N=346)	Treatment Group (n=179)	Control Group (n=167)	t- statistics or χ^2
Child gender				.02
Male	34.97	34.64	35.33	
Female	65.03	65.36	64.67	
Child age	13.38 (1.24)	13.38 (1.25)	13.37 (1.23)	.04
Guardian gender				.76
Male	20.52	22.35	18.56	
Female	79.48	77.65	81.44	
Guardian age	45.70 (14.61)	44.01 (13.89)	47.49 (15.17)	-1.5
Double orphan				6.29*
Yes	28.91	23.03	35.40	
Number of children	3.31 (1.92)	3.36 (2.03)	3.26 (1.79)	.48
Financial support by others				.09
Yes	43.93	44.69	43.11	
Child's reported physical health				1.37
Not good	29.19	29.05	29.34	
Good	45.38	43.02	47.9	
Excellent	25.43	27.93	22.75	
Confidence in educational plan (W1)				.50
Yes	78.32	79.8	76.55	
Confidence in educational plan (W3)				16.24**
Yes	90.23	96.62	81.48	
PLE attendance				24.49*
Yes	78.90	89.38	67.66	
PLE score	24.10 (6.86)	22.11 (7.37)	26.92 (4.84)	-1.89[†]
Beck Hopelessness Scale				
Baseline	5.35 (0.2)	5.59	5.09	1.38
24-month follow-up	3.26 (0.22)	2.7	2.8	-4.07**
Tennessee Self-Concept Scale				
Baseline	78.4 (0.51)	77.8	78.98	-1.23
24-month follow-up	84.2 (0.45)	85	83.4	2.38*

[†]Note: $p < .1$ *
 $p < .05$ **
 $p < .01$ ***
 $p < .001$

Table 2

Multilevel logistic regression analyses on PLE attendance and confidence in educational plans

	PLE attendance		Plan confidence	
	OR	95% CI	OR	95% CI
Suubi-Maka program	7.16**	[2.03; 25.29]	6.06*	[1.23; 29.91]
Child's gender (Female)	1.75**	[1.21; 2.54]	1.54	[0.77; 3.06]
Child age	1.07	[0.92; 1.24]	1.30	[0.96; 1.76]
Child's physical health (Good)	1.50	[1.00; 2.24]	2.35*	[1.16; 4.80]
Child's physical health (Excellent)	0.73	[0.46; 1.15]	4.35**	[1.54; 12.26]
Guardian's gender (Female)	0.50**	[0.31; 0.82]	2.28	[0.94; 5.57]
Guardian's age	1.02***	[1.01; 1.04]	0.98	[0.96; 1.01]
Single orphan (reference: No)	1.44	[0.98; 2.13]	0.69	[0.31; 1.55]
Number of children	0.96	[0.88; 1.05]	1.12	[0.93; 1.35]
Financial support by others (reference: No)	1.19	[0.82; 1.72]	1.33	[0.63; 2.79]
Baseline outcome measure			2.41*	[1.18; 4.94]

*
p .05**
p .01***
p .001

Table 3

Multilevel linear regression analyses of PLE

	PLE	
	b	95% CI
Suubi-Maka program	-5.53*	[-11.0; -0.1]
Child's gender (Female)	1.48**	[0.5; 2.4]
Child age	1.06***	[0.5; 1.6]
Child's physical health (Good)	0.32	[-1.6; 2.2]
Child's physical health (Excellent)	-0.32	[-2.8; 2.2]
Guardian's gender (Female)	0.23	[-1.5; 1.9]
Guardian's age	0.02	[-0.0; 0.1]
Single orphan (reference: No)	0.42	[-1.1; 1.9]
Number of children	0.13	[-0.3; 0.6]
Financial support by others (reference: No)	0.25	[-0.4; 1.0]

*
p .05**
p .01***
p .001

Table 4

Multilevel linear regression analyses on hopelessness and self-concept

	Beck Hopelessness Scale		Tennessee Self-Concept Scale	
	b	95% CI	b	95% CI
Suubi-Maka program	-0.97**	[-1.7; -0.3]	1.83***	[0.8; 2.9]
Child's gender (Female)	-0.63	[-1.4; 0.1]	3.30***	[2.0; 4.6]
Child age	0.16*	[0.004; 0.3]	-0.79	[-1.6; 0.0]
Child's physical health (Good)	-0.64**	[-1.0; -0.2]	1.35	[-1.3; 4.0]
Child's physical health (Excellent)	-0.33	[-1.0; 0.3]	-0.06	[-2.3; 2.2]
Guardian's gender (Female)	-0.20	[-1.2; 0.8]	-1.02	[-3.5; 1.5]
Guardian's age	-0.00	[-0.0; 0.0]	0.01	[-0.1; 0.1]
Single orphan (reference: No)	0.12	[-0.8; 1.0]	2.56**	[0.9; 4.2]
Number of children	0.02	[-0.2; 0.2]	-0.34	[-0.9; 0.2]
Financial support by others (reference: No)	-0.38	[-0.9; 0.2]	2.55***	[1.3; 3.8]
Baseline outcome measure	0.27***	[0.1; 0.4]	0.23***	[0.1; 0.3]

*
p .05**
p .01***
p .001