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Asset Ownership and Health and Mental Health Functioning Among AIDS-Orphaned Adolescents: Findings From a Randomized Clinical Trial in Rural Uganda

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Abstract

This study evaluated an economic empowerment intervention designed to promote life options, health and mental health functioning among AIDS-orphaned adolescents in rural Uganda. The study used an experimental design in which adolescents (N=267) were randomly assigned to receive an economic empowerment intervention or usual care for orphaned children. The study measured mental health functioning using 20 items of the Tennessee Self-Concept Scale (TSCS: 2)—a standardized measure for self-esteem—and measured overall health using a self-rated health measure. Data obtained at 10-month follow-up revealed significant positive effects of the economic empowerment intervention on adolescents' self-rated health and mental health functioning. Additionally, health and mental health functioning were found to be positively associated with each other. The findings have implications for public policy and health programming for AIDS-orphaned adolescents.

Keywords

AIDS-orphaned adolescents; sub-Saharan Africa; assets; children savings accounts; economic empowerment; mental health; Uganda; intervention

Introduction

Throughout the world, the number of children directly affected by the AIDS pandemic is increasing exponentially. It is estimated that by the year 2010, there will be 30 million AIDS-orphans (defined as children who have lost a parent or both parents to AIDS)—constituting 68% of the total number of orphans worldwide (44 million) (Porter, 2000). About 80% of the world's AIDS-orphans reside in sub-Saharan Africa and more than half of them are between the ages of 10 and 15 (UNICEF, 2005). Uganda is one of the countries where a considerable number of children are orphaned due to AIDS. UNICEF (2008) estimates that 2.3 million Ugandan children below age 18 are orphans (having lost one or both parents), with about half of these (51 percent) a direct result of the AIDS pandemic. Moreover, despite the falling rates

of HIV infection in the country, it is projected that the number of AIDS-orphans will remain high or even increase because many parents are already infected, and most of them will die.

Death of a parent due to AIDS has many effects on the children. Financially, children affected by AIDS are vulnerable due to long episodes of illness which often precede death of the parents. As a result, such children are at an elevated risk of living in poverty (Case, Paxson, & Ableidinger, 2004). In addition, there are negative effects of parent death on children's health functioning and psychosocial development (Atwine, Cantor-Graae, & Banunirwe, 2005). Children whose parent(s) die due to AIDS may be subject to high levels of stress, which can threaten mental and physical health functioning. Further, children orphaned as a result of AIDS are more likely to suffer recurrent trauma, anxiety, depression, and academic difficulties (Atwine et al., 2005; Matshalaga, 2002; Rotheram-Borus, Lee, Gwadz, & Draimin, 2001).

Parental death due to AIDS may also have significant implications for children's self-concept and self-esteem. The death of a parent may foster negative inferences about the self in orphans (Rotheram-Borus et al., 2001). The negative inferences, in turn, may increase distress and negatively influence mental health functioning (Kim & Cicchetti, 2006). On the other hand, a positive self-concept and self-esteem may play a critical role in promoting mental health and buffering distress from parents' death. Self-esteem can alleviate negative effects of distress and help the child to maintain adequate relationships with others (Cast & Burke, 2002). In addition, self-esteem may influence general health behaviors and values among adolescents (Rivas Torres & Fernandez Fernandez, 1995; Rivas Torres, Fernandez Fernandez, & Maceira, 1995). Therefore, interventions that help orphaned children to overcome stress and that promote aspects of mental health such as positive self-concept and self-esteem may be critical not only to the children's positive health functioning, but also their development into competent adults.

Several organizations working in countries heavily affected by AIDS—including Uganda—are exploring and experimenting with new strategies for caring for the orphaned children resulting from AIDS. These strategies range from those that focus exclusively on therapeutic counseling—either within a family environment or an institutional setting—to those that incorporate economic empowerment approaches into usual family-based care. Although the therapeutic counseling approaches have been in existence for a long time, the economic empowerment approaches—as a form of care and support for orphaned children—are relatively new (see Ssewamala, Alicea, Bannon, & Ismayilova, 2008; Booysen & Van Der Berg, 2005; Sherer et al., 2004). The assumption of the new approaches is that support for families caring for orphaned children should go over and above therapeutic counseling and incorporate economic empowerment opportunities in their interventions. Specifically, such families should be given opportunities for accumulating financial-related resources (herein referred to as asset-building) because assets may offer children hope for brighter futures through education and investment. Indeed, “asset-building”, which refers to efforts that enable people with limited financial and economic resources or opportunities to acquire and accumulate long-term productive assets, is increasingly viewed as a critical factor for reducing poverty, improving one's psychosocial functioning, and positively impacting attitudes and behaviors (Ssewamala et al., 2008). Moreover, interventions that incorporate economic opportunities in their design may also help reduce the risk of HIV/AIDS in the next generation by reducing mental health problems and discouraging engagement in risky sexual behaviors (Ssewamala, 2005; Ssewamala et al., 2008).

This study reports results from one of the newly-initiated economic interventions for adolescents orphaned as a result of AIDS in Uganda. The program is called SUUBI, which means “hope” in one of the local languages spoken in Uganda. The SUUBI program involves creating asset-building opportunities and promoting life options for AIDS-orphaned

adolescents. Adolescents in the SUUBI program are offered the opportunity to open a savings account for secondary education or for microenterprise development. The SUUBI program also provides twelve 1–2 hour training sessions on career planning, and financial planning. Data are collected on a range of outcomes, including adolescents' mental health and self-rated health functioning status. Therefore, the SUUBI program offers an important opportunity to explore the possible relationship between asset accumulation and adolescents' health and mental health functioning. In this regard, this study examines the extent to which the economic empowerment intervention program being tested by SUUBI influences health and mental health functioning among AIDS-orphaned adolescents. The experimental design of the SUUBI program (assigning adolescents to either a control or experimental condition) makes it possible to compare program impacts on health and mental health functioning of the participants in the treatment condition vis-à-vis participants in the control condition.

Literature review

Adolescents' self-esteem, mental health functioning, and health

Self-esteem generally refers to an individual's overall evaluation of the self (Davis-Kean & Sandler, 2001; Gecas, 1982; Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995). While high self-esteem refers to a favorable evaluation of the self, low self-esteem refers to an unfavorable appreciation of the self. Self-esteem has been regarded as a buffer, providing protection from harmful experiences (Longmore & Simmons, 1997; Thoits, 1994) and a "boost" of mental health and psychosocial functioning. Distress in the form of depression and anxiety can have detrimental effects on one's competency and worth (Abela, 2002; Kim & Cicchetti, 2006; Rosenberg, Schooler, & Schoenbach, 1989). Self-esteem can alleviate these negative effects and provide resources for maintaining relationships with other individuals (Cast & Burke, 2002).

Childhood—including adolescence—is a critical time for the development of self-esteem, which in turn can influence outcomes in later life (Boden, Fergusson, & Horwood, 2008; Davis-Kean & Sandler, 2001). In particular, self-esteem during childhood and adolescence can have a great impact on behaviors and physical and mental health functioning in adulthood (Boden et al., 2008). The association between self-esteem of adolescents and a number of positive outcomes has been well documented (Boden et al., 2008; Cast & Burke, 2002; Comer, Haynes, Hamilton-Lee, Boger, & Rollock, 1986; Davies & Brember, 1999; Hansford & Hattie, 1982). For instance, Davies and Brember (1999) have reported positive correlation between self-esteem and school performance, while Comer and colleagues reported a positive relationship between self-esteem and social competence among adolescents attending inner city schools (Comer et al., 1986). Similar results—related to educational performance—were reported in Hansford and Hattie (1982) study. Studies have also reported associations between low self-esteem of adolescents and substance abuse (Bay, 1983; Unger, Kipke, Simon, Montgomery, & Johnson, 1997), depression (Kim & Cicchetti, 2006), anxiety (Newbegin & Owens, 1996), and the quality of social relationships (Boden et al., 2008).

Further, self-esteem has been found to be significantly associated with health practices. Specifically, self-esteem has been found to be positively associated with general health behaviors for both younger and older adolescents (Rivas Torres & Fernandez Fernandez, 1995; Rivas Torres, Fernandez Fernandez, & Maceira, 1995).

It should, however, be noted that the positive outcomes of high self-esteem are not always supported by empirical research. After a detailed literature review with different age groups, Baumeister and colleagues posited that the links between self-esteem and the outcome measures are at best mixed (Baumeister, Campbell, Krueger, & Vohs, 2003). Against that background, the authors (Baumeister and colleagues) concluded that high self-esteem may not

necessarily prevent adolescents from unhealthy behaviors such as drinking, drug use or engaging in sexual risk taking (see Baumeister, Campbell, Krueger, & Vohs, 2003). And Marmot (2003) reminds us to pay attention to the behavioral context, which would likely impact on the relationship between self-esteem and health functioning.

Effects of assets on children and adolescents

Research suggests that parental assets have positive impacts on outcomes for children and adolescents, including their educational outcomes. For instance, home ownership and net worth are positively associated with children's educational outcomes: children of households who own their homes are more likely to graduate from high school than children of renters (Aaronson, 2000; Green & White, 1997). Other studies have found that parents' net worth, controlling for income and other aspects of socioeconomic status, is positively associated with the educational achievement of children (Conley, 2001; Zhan, 2006; Zhan & Sherraden, 2003).

Zhan (2006) offers two possible explanations for the positive effects that assets have on children's educational outcomes. First, assets enhance economic security by buffering unanticipated income shocks such as unemployment, illness, and death. Assets, therefore, may reduce potential negative effects of income losses on child development. Second, assets may lead to positive attitudes and behaviors of both parents and children. Thus, parents with assets are likely to be future-oriented and to have specific hopes and plans, which in turn can lead to positive parenting behaviors as well as higher aspirations for the child (Scanlon & Page-Adams, 2001; Yadama & Sherraden, 1996).

Assets, mental health and health functioning, and child outcomes

While it is often suggested that parental assets have positive impacts on the psychosocial well-being of children (Scanlon & Page-Adams, 2001; Sherraden, 1991), the effects of assets on children's mental health are not well documented. Axinn and colleagues' study, which examined whether parental income, home equity, and financial assets in childhood exert significant influences on children's self-esteem at age twenty-three, is an exception (Axinn, Duncan, & Thornton, 1997). That study found a positive link between parental aspirations for children's college education and children's self-esteem—specifically children whose parents had put money aside for their children's college education (at age one) were found to have higher self-esteem at age twenty-three. That finding is directly relevant to this study, since the SUUBI Program helps families save money towards their children's secondary education.

Another area which has not been well examined is the explicit relationships among asset-ownership, mental health, and health outcomes of adolescents. Assets are resources for not only buffering economic hardships but also achieving future goals. If adolescents perceive that they have resources to help achieve their future goals (e.g., completing secondary school or vocational training), their evaluation of self and their overall mental health will be enhanced, making these adolescents less likely to be involved in risky behaviors that may negatively impact on their physical health. Since adolescents' saving goals in the SUUBI program intervention (detailed below) are specifically focused on secondary education or vocational training, we would expect positive impacts of the economic empowerment intervention on mental health functioning as well as health behaviors among the participating adolescents. Indeed, to our knowledge, this is the first empirical study to examine the positive impacts of economic assets on mental health and health functioning of one of the most disadvantaged group of children: AIDS-orphaned adolescents in sub-Saharan Africa.

A common challenge in this area, as in other areas, is establishing causal effects. Prior studies of the effect of assets on child and adolescent functioning have mainly relied on observational

data, thus making it impossible to be certain that all relevant differences between asset-owning families and other families have been controlled for. Families who own assets may also possess personal qualities that promote better child and adolescent functioning, or may benefit from other advantages not measured in the data. This study differs from most work in this area by using a randomized controlled experimental design to evaluate the impact of a novel asset-building intervention. This allows us to estimate causal effects with more confidence.

A second important strength of this study, relative to prior research, is its focus on a sub-Saharan African setting. The effect of assets may well differ in low-resource settings such as sub-Saharan Africa and may also vary across cultures. This study is one of a very few examining the effects of assets on child and adolescent functioning in this type of setting.

SUUBI program in Uganda

Approaches to orphan care fall primarily into two categories: institutionalization and reactive strategies. Institutionalization involves placing children into orphanages or similar settings, while reactive strategies involve organizations providing “aid” mainly for physical needs including recreation services (a place to learn and play), counseling and provision of food aid (Drew, Makufa & Foster, 1998; UNICEF, 2004a; 2004b; UNAIDS, UNICEF, & USAID, 2004). Although each of these approaches is a response of well meaning governmental and non-governmental agencies to the problems of children orphaned due to AIDS, they have also each attracted criticism: Institutionalization tends to be expensive with the cost per child being substantially higher than that of family-based care; may not allow children to feel like they belong to any specific community; and may fail to meet children’s emotional needs (see Drew et al., 1998; UNAIDS et al., 2004). Moreover, for very young children, institutionalization is particularly inappropriate because the healthy emotional, cognitive, and even physical development of children in this age group requires that they have at least one loving caregiver with whom they can form a bond (UNAIDS et al., 2004). Reactive services in the form of “aid”, on the other hand, tend to encourage overdependence, especially on foreign donations, without necessarily empowering the families to use existing economic resources, even when they are scarce, and to help families to plan for the future.

The SUUBI program combines the reactive care usually provided for orphaned children in Uganda with an asset-building/economic empowerment intervention. The intervention—funded by the National Institute of Mental Health (R21 MH076475-01), with IRB approval from Columbia University (AAAA5337) and Uganda National Council of Science and Technology (ref SS 1540)—used an experimental design (2005–2008). Fifteen comparable primary schools were selected to participate in the study. The selected schools were all rural public schools located in Rakai District, an area of Uganda that has been hardest hit by AIDS, and where the first HIV case in the country was reported 25 years ago (Serwadda et al., 1985). Each of the fifteen schools was randomly assigned to the experimental or control condition such that all selected children from a particular school received the same intervention (primarily to address issues related to sample contamination). Each child in the control condition received the usual reactive care for orphaned children (described earlier). Children in the experimental condition (the SUUBI-program) received, in addition to the usual care, an economic empowerment intervention aimed at promoting asset-accumulation for families—and consisting of three major components: 1) workshops focused on asset-building and future planning; 2) a monthly mentorship program for adolescents with peer mentors on life options; and 3) a Child Development Account (CDA), dedicated to paying for secondary schooling, vocational training and/or a family small business. The CDAs were matched savings accounts, with a match rate of 2:1 as an incentive for participants to save, but with a limit on the maximum savings that could be matched (the match cap, in this case, was equivalent to \$10 a month). Put simply, if a child in the SUUBI-Program deposited \$10 each month for 1 year, the family’s

\$120 savings would be matched by \$240 from the program and the CDA would therefore give the child a total of \$360 that could be used for secondary education, vocational training and/or for a family small business. The purpose of the CDA was to provide the children with some financial resources with which they could begin to realistically plan for their future education or vocational training, something likely to impact on their self-esteem and health functioning (including mental health).

Were the families (and their children) in the study able to save? Indeed, although the study was focused on disadvantaged families raising AIDS-orphaned children in a poor sub-Saharan African country, the families in the program were able to save. We used Average Monthly Net Deposit (AMND)—calculated by dividing net deposit by the total number of months of participation—as the measure of saving performance and found that children in the treatment group saved, on average, an equivalent of USD\$6.33 a month or USD\$76 a year. There were no statistically significant differences in savings by gender (\$6.33 in AMND for boys vs. \$6.88 in AMND for girls), indicating that girls saved as well as boys. And there were no statistically significant differences in savings by type of orphanhood (\$7 in AMND for double orphans vs. \$6.33 in AMND for single orphans), indicating that double orphans saved as well as single orphans (Ssewamala & Leyla, in press; Curley, Ssewamala, & Han, 2008). After matching individual savings—by a ratio of 2:1—the participants accumulated, on average, USD\$228 per year. Indeed, although these savings amounts may seem very modest by the standard of Western countries, these are huge sums in a poor country like Uganda, where the GDP per capita is US\$900 (CIA World Fact Book, 2008). Moreover, the \$228 yearly savings are almost enough to pay for slightly under two years of a student's secondary education in an ordinary semi-urban public secondary school, which costs anywhere between US\$150 and US\$200 per academic year (Ssewamala & Ismayilova, in press). Since the actual savings amounts used to compute AMND come from financial institutions holding the CDAs, the amounts are quite accurate.

Methods

Data and sample

This study uses longitudinal data from two time points -- data collected at baseline/pre-SUUBI intervention (herein referred to as Wave 1) and 10 months post-SUUBI intervention (herein referred to as Wave 2) -- to examine how the SUUBI program influenced: (1) mental health functioning among AIDS-orphaned children participating in the program. We specifically tested the extent to which the children's self-concept changes—over time—and whether participants in the treatment condition showed different patterns of changes/growth in self-esteem compared to children in the control condition, following the intervention. Further, controlling for study participants' key socioeconomic characteristics, we examined the association between the SUUBI program and self-esteem; (2) we examined health functioning status changes during the study period, and whether the changes differ by experimental group assignment; and (3) we tested the extent to which mental health and health functioning of adolescents in the study are interrelated.

The starting sample for this study was 286 AIDS-orphaned children. The experimental group had 138 children from 9 schools, while the control group had 148 children from the remaining 6 schools. However, the sample was reduced to 268 because of attrition and missing data. The experimental group and control group were reduced to 131 and 137, respectively. The average age for the children was 13.7 years at baseline (with a range from 11 to 17). Children were in their final year of primary school (which in Uganda goes up to grade 7).

Measures

The intervention: SUUBI program—The key independent variable of this study—used to examine the program effects of interest, including development of mental health and health functioning among the study participants—was whether a respondent was assigned to the SUUBI program (treatment group) or not. This variable was dummy coded in the regression analysis.

Mental health functioning—We used the Tennessee Self-Concept Scale: Second Edition (TSCS: 2) to measure children's self-concept and self-esteem (Fitts & Warren, 1996)—representing mental health. The full TSCS: 2 is an 82-item self-report questionnaire which consists of 6 specific domains of self-concept (physical, moral, personal, family, social, and academic). We used a shorter version of the TSCS consisting of 20 items, previously tested in Uganda for context and wording that reflected the language and speech used by Ugandan youth (Ssewamala et al., 2008). Each item had a 5-point response ranging from 0 (“completely false”), to 4 (“completely true”). The sum of 20-item TSCS scores therefore ranges from 0 to 80. The Cronbach's alphas of the 20 items were .81 at baseline (Wave 1) and .80 at 10-month follow-up (Wave 2). In the analysis for this paper, the total scores of the TSCS are standardized using t-scores, which have a mean of 50 and a standard deviation of 10. T-scores are useful in comparing results across studies (Limb, 2004). Higher TSCS score represents higher self-concept and self-esteem, hence better mental health functioning.

Self-rated physical health—Respondent's self-rated health levels at Waves 1 and 2 were included in the study. The health measure (“At present time, would you say that your physical health is?”) was a Likert-type variable ranging from “*poor*” to “*excellent*”, which was dummy coded as “*poor/fair*” or “*good/excellent*” in the regression analysis. The reference group was “*poor/fair*”. Previous studies indicated that this dichotomous measure of health status is reliable (Baker, Stabile, & Deri, 2001; Meer, Miller, & Rosen, 2003). In addition, numerous studies suggest that self-rated health status is a useful proxy for more objective health measures (Frankenberg & Jones, 2004; Jylhä, Volpato, & Guralnik, 2006).

Other control variables—Socioeconomic and demographic characteristics of respondents were included in the analysis to control for a range of factors that could potentially confound the relationship between the SUUBI program, mental health, and health functioning. All control variables used in the study were measured at baseline. These were: age of the child, gender of the child, household size, orphanhood status (whether double orphan—with no living parent; or single orphan—with one living parent), identity of financial supporter, and employment status. In addition, this study included five types of asset ownership to control for socio-economic status of family where children live: homeownership; small business ownership; ownership of bicycle, motorcycle, and car; sum of 5 types of gardens (banana garden, coffee garden, sweet potato garden, cassava garden, other gardens)—which is another measure of socioeconomic status; and sum of 5 types of livestock (cow, goat, pig, poultry, any other animals).

Analysis plan

One-way frequency tables were used to generate percentages of participant characteristics for the total sample and stratified by experimental group membership. In addition, measures of central tendency and variability (i.e., means and standard deviations) were generated for continuous variables. These results were examined for the presence of outlying cases, with outliers being defined as cases with values located more than three standard deviations away from the mean. Experimental and control group means and proportions were compared using design-based correction factors to generate appropriate p-values in the presence of correlated responses from participants who attended the same schools.

Following characterization of the population, we performed multilevel regression analyses of the Wave 2 mental health and health outcomes onto the covariates described in the previous paragraphs along with the corresponding Wave 1 mental health and health functioning scores while also controlling for the corresponding Wave 2 scores (i.e., Wave 2 mental health was included as a covariate in the analysis of Wave 2 health functioning outcome, and Wave 2 health functioning was included as a covariate in the analysis of the Wave 2 mental health outcome). School ID was included as a random intercept term in these analyses to properly account for the correlation of responses arising from participants who attended the same schools. Multilevel regression analyses were estimated via maximum likelihood using the Stata 10 commands *xtreg* for the continuous self-esteem outcome and *xtlogit* for the binary health functioning outcome.

Results

Descriptive and bivariate analysis

As noted earlier, the sample analyzed in the study was reduced from 286 to 267 due to attrition and missing data on some variables (see Table 1). The average age of the children was 13.7. The sample was fairly evenly balanced between girls (57%) and boys (43%). These percentages are a reflection of the “point of entry” for the SUUBI intervention, which was primary school level. Generally, because of the Ugandan government policy of free universal primary school, there are more girls enrolled in primary school than in secondary school, which at the time of this study was neither free nor universal. About 41% of the sample had no father living (paternal orphans), 19% reported no mother living (maternal orphans), and 40% had lost both parents (double orphans). On average, the sample reported large family sizes with an average of 6.7 in the household. About 31% of children reported that their mother or father financially provided for their families, 30% named grandparents as the main providers, and 40% named others (including uncles, aunts, sisters and brothers).

We used bivariate analyses to examine the extent to which socioeconomic and family characteristics at Wave 1 differed between the treatment and control groups. We found no significant differences between the two groups in children’s gender, age, household size, type of orphan, identity of financial provider, employment status, business ownership, number of transportation, number of gardens, and number of livestock. However, although the two groups were selected from schools that were similar in terms of socioeconomic status and overall academic performance, bivariate results indicate that the two groups differed on homeownership rate. Members of the control group were more likely to own their homes (96% as compared to 86%). We controlled for this characteristic, as well as the others shown in Table 1, in the multivariable regression analyses. Of note, one outlying case was detected during outlier screening for the Wave 2 mental health outcome (value = 4.95) and was removed prior to performing the multilevel regression analyses described below.

Impact of the SUUBI-program on mental health

The current study examined the extent to which an economic empowerment model emphasizing asset-ownership—in this case children’s savings accounts for education or family businesses—was associated with development of children’s self-esteem, controlling for a number of children’s socioeconomic and family characteristics, physical health functioning, as well as the child’s baseline self-esteem score. Using the t-score of the 20-item Tennessee Self-Concept Scale (TSCS) as the measure of self-esteem, the results of the multilevel regression analysis indicate that participants in the treatment condition reported higher self-esteem at the 10-month follow-up than the control group. All other things being equal, the difference in the t-score of TSCS: 2 between the two groups was 3.48, which was significant at $p < .05$ (see Table 2). The results of this study supported the findings of Axinn et al (1997)

that found positive associations between parental savings for children's college education and children's self-esteem. While Axinn et al (1997) tested a long-term (22-year interval) impact of savings by parents on children's self-esteem, this study found relatively a short-term (10-month interval), but significant influence of savings on positive growth of self-esteem.

Several other findings of the regression analysis are noteworthy. First, in regards to gender, the results demonstrate that girls in the current sample were likely to have higher self-esteem than boys. Second, controlling for several factors, homeownership was significantly associated with positive changes in children's self-esteem. Children living in their own houses (homeowners) had self-esteem 4.12 points higher than children without their own home (renters). The positive association suggests that assets may play a significant role in influencing children's well-being and self-worth. However, we found that the other measures of asset ownership have no significant impact on self-esteem of adolescents. Third, consistent with previous research (Glendinning, 1998; James, 1997), we found that self-rated health functioning was significantly linked with self-esteem. Healthy functioning children were likely to have higher self-esteem than children with poor or fair health functioning.

Impacts of the SUUBI program and mental health on self-rated health functioning

Turning to the self-rated health functioning outcome, the first key finding of the multilevel logistic regression involving the Wave 2 health functioning outcome is that the SUUBI program is positively associated with self-rated health functioning. The treatment group has over twice the odds of rating their health as good or excellent than the control group (OR = 2.15). Second, self-esteem measured by TSCS is also positively associated with self-rated health functioning status. One unit increases in self-esteem at Waves 1 and 2 are positively associated with the probability of participants rating their health functioning as good or excellent with the odds ratio of 1.04 and 1.05, respectively. For each standard deviation increase in self-esteem at Waves 1 and 2, the corresponding odds ratios were 1.47 and 1.76, respectively.

In regards to other covariates, first, older adolescents are less likely to report being in good health functioning status. Second, adolescents with the mother living are likely to report being in better health functioning status than dual orphans. This finding suggests that a mother's presence is important to a child's health functioning. Third, among asset ownership variables, adolescents with more gardens are likely to report better self-rated health functioning. Specifically, a one unit increase in the number of gardens is associated with 1.37 times of increase in the odds of an adolescent rating his/her health functioning as good/excellent. Last, we found that other covariates such as gender, household size, employment status, and financial support type are not significantly associated with adolescent's self-rated health functioning.

Discussion

This study provides the first evidence of the effects of an economic empowerment intervention—over and above usual care for orphaned children—on children's well-being, including self-rated health and mental health functioning. It is important to note that since the study used a randomized experimental design, the observable differences between the two groups during the study period could, with some degree of confidence, be attributable to the effects of the economic intervention as implemented. Specifically, we find that the SUUBI program intervention is associated with increased levels of self-esteem, an important measure of adolescents' mental health and psychological well-being. The positive impacts of the SUUBI program and self-esteem on self-rated health are also noteworthy. We find self-esteem to have a positive impact on self-rated health functioning.

What aspects of the SUUBI program enhance children's mental health and health functioning? We cannot provide a clear answer to this question because the SUUBI economic intervention

was implemented as a package/bundle of economic empowerment services. All children in the treatment group received—over and above the usually provided care for orphaned children in Uganda—an economic empowerment intervention, as a package/bundle, comprised of a matched savings account and the associated workshops on financial management, plus a mentorship component with peer mentors on life options and career planning. Future studies may consider evaluating each program component of the SUUBI intervention by using a standardized questionnaire that measures participants' attitudes toward specific program features. In addition, future studies should vary the elements of the economic empowerment packages so that the effectiveness of each specific element can be discerned.

Given that the research literature documents that increases in self-esteem have been associated with both positive and negative behavioral outcomes, one concern of note is whether increased self-esteem could be associated with increased sexual risk behavior or intentions to engage in sexual risk behavior. To investigate that issue, we regressed a composite of five sexual behavior intentions survey items captured at Wave 2 onto the Wave 2 self-esteem score (there was insufficient actual sexual behavior reported to investigate sexual behavior directly). Results from this analysis indicated that in this sample self-esteem was negatively associated with intentions to engage in sexual risk behavior ($B = -.15$, $SE = .03$, $Z = -5.83$, $p < .001$).

Overall, our findings have implications for theory. First, while theory suggests that positive links exist between assets and children's well-being (Sherraden, 1991), there have been only a few studies empirically testing this association. This study contributes to the emerging body of empirical evidence regarding the relationship between assets and children's well-being. Specifically, the study finds that asset ownership plays a significant role in children's mental and physical health. The results of this study also suggest that asset theory—hitherto primarily applied to studies in Western industrialized countries—can be applied to other cultures, including poor developing countries like Uganda, where many families and children face severe socio-economic hardship—including inadequate health services—which may hamper children's physical and psychosocial development. Indeed, without interventions to improve economic well-being, these phenomena will likely only serve to keep children in these poor countries in a vicious cycle of poverty, perpetuating children's poor mental health and health functioning.

There are some limitations that should be noted. First, with the exception of saving data which came directly from financial institutions holding the children's savings accounts, the rest of the data used in this paper was from children's self-report. Therefore, it is susceptible to the shortcomings of self-reporting, including social desirability. Future work would benefit from a more comprehensive understanding of psychosocial outcomes and their relationships to objective health status from multiple informants (including parents, teachers, and clinicians) and multiple methods (e.g., direct observation, clinical interviews, and laboratory test results; Demo, Small, & Savin-Williams, 1987). Second, the data presented in this paper were based on two data points: baseline and at 10-month post-treatment. Future studies may benefit from a relatively longer follow-up period, with more data points. Third, while family income and educational attainment of parents are key measures of socioeconomic status—and hence frequently used in explaining the well-being of children—the survey did not include items on family income due to the difficulty in obtaining reliable and accurate data on this item when children are the respondents (Currie, Elton, Todd, & Platt, 1997; Goodman et al., 2000). In regards to parents' educational attainment, the study did collect this information but this particular item had too many observations reported as “*I don't know*” for meaningful analysis (28% of mother's education and 57% of father's education were reported as “*I don't know*”). A follow-up study on SUUBI has incorporated a survey where the children's caregivers/parents will be respondents as well. This addition is expected to strengthen the data quality for those specific items that require caregivers' responses. Additionally, an exclusive focus on school-

going adolescents in a rural setting, where many of the poorest orphans may not be in school, may mean that the participants in this study have different behavioral trends than other orphaned children not currently attending school. Future studies may benefit from a more inclusive criteria, including all orphaned children regardless of whether they are enrolled in school or not. Last but not least, although the measures used in the study had been pilot-tested in a similar project in Uganda (Ssewamala et al., 2008), further testing of these measures used is needed. In particular, even though the standardized Tennessee Self Concept Scale (TSCS) used in this study has been used extensively on children of African descent and tested in several international settings (see Fitts & Warren, 1996), there is a need to further test its validity and reliability with African children in a poor sub-Saharan African country like Uganda. Moreover, in future research, it would be useful to have other measures of mental health (for instance, scales measuring anxiety or depression). As Davis-Kean and Sandler (2001) have argued, more research is needed to clearly understand how children evaluate their self-esteem and other aspects of mental health.

Overall, even with the aforementioned limitations the findings of this study indicate that in rural Uganda, asset ownership matters for AIDS-orphaned children's well-being, including health and mental health functioning.

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Table 1

Descriptive and bivariate analysis of the sample: Wave 1 data

Variables	Total (N=268)	Treatment Group (n=131)	Control Group (n=137)	p-value
Children's gender (%)				0.44
Male	43.28	39.69	46.71	
Female	56.72	60.31	53.29	
Children's age	13.72 (1.32)	13.82(1.31)	13.62(1.33)	0.55
Type of orphan (%)				0.50
No father	40.67	40.77	41.79	
No mother	19.40	22.31	17.16	
Both parents died	39.93	36.92	41.04	
Household size	6.71 (2.97)	7.05(3.21)	6.37(2.70)	0.16
Source of financial support (%) ^a				0.40
Mother or father	30.22	33.46	26.68	
Grandparents	29.48	27.19	32.29	
Others	40.30	39.45	41.03	
Employment status (employed, %)	36.94	41.98	32.12	0.13
Homeownership (%)	91.04	86.26	95.62	0.02
Business ownership (%)	15.30	17.56	13.14	0.52
Number of transportation options	.69 (.67)	.73 (.62)	.66 (.72)	0.66
Number of gardens	4.00 (1.19)	3.82 (1.22)	4.17 (1.14)	0.18
Number of livestock	1.83 (1.09)	1.95 (1.13)	1.71 (1.04)	0.30
Child self-rated health at W1 (%)				0.17
Good or excellent	84.70	81.68	87.59	
Poor or fair	15.30	18.32	12.41	
Self-Esteem at W1	50.00 (10.00)	51.16(9.66)	48.90 (10.22)	0.27

Note: The reported p-values originate from a design-based Rao-Scott test for categorical outcomes and a design-based comparison of means for continuous outcomes.

^aN = 264 (3 missing cases from the treatment group; 1 missing case from the control group).

Table 2

Multilevel linear regression analyses of self-esteem measured at Wave 2

	b	95% CI
Constant	41.33***	27.21, 55.46
SUUBI program (Control group)		
Treatment group	3.48*	0.42, 6.55
Child age	-.13	-0.96, 0.70
Child gender (girls)		
Boys	-2.83*	-5.10, -.55
Household size	-.08	-.46, .30
Parents survival (Both parents died)		
Only mother alive	-.38	-3.07, 2.31
Only father alive	-2.04	-5.12, 1.03
Source of financial support (Others) ^a		
Parents or step parents	-.19	-3.08, .270
Grandparents	-.38	-1.71, 0.95
Employment status: Employed	.44	-1.95, 2.85
Homeownership	4.12*	0.04, 8.20
Business ownership	.10	-2.99, 3.18
Number of transportation options	.17	-1.55, 1.90
Number of gardens	-.41	-1.45, 0.64
Number of livestock	-.55	-1.65, 0.64
Respondent's health at Wave 1 (Poor or fair)		
Good or excellent	5.85***	2.72, 8.97
Respondent's health at Wave 2 (Poor or fair)		
Good or excellent	4.40***	1.78, 7.02
Self-esteem at baseline	.03	-0.09, 0.06

Note: Analysis $N = 267$. Variables in parenthesis are reference.

^aIncludes both parents died subgroup ($N = 103$) and no data subgroup ($N = 4$).

*
 $p \leq .05$

**
 $p \leq .01$

 $p \leq .001$

Table 3

Multilevel logistic regression analysis of self-rated health at Wave 2

	OR	95% CI
SUUBI program (Control group)		
Treatment group	2.15*	1.05, 4.42
Child age	.79 [†]	0.61, 1.02
Child gender (girls)		
Boys	.75	0.37, 1.54
Household size	.93	0.83, 1.04
Parents survival (Both parents died)		
Only mother alive	2.53*	1.04, 6.17
Only father alive	1.11	0.44, 2.77
Source of financial support (Others)		
Parents or step parents	.71	0.28, 1.80
Grandparents	1.00	0.66, 1.51
Employment status: Employed	.86	0.41, 1.80
Homeownership	1.20	0.34, 4.24
Business ownership	1.22	0.46, 3.27
Number of transportation options	.89	0.52, 1.52
Number of gardens	1.37*	1.01, 1.86
Number of livestock	1.14	0.81, 1.60
Self-esteem at Wave 1	1.04*	1.00, 1.08 ^b
Self-esteem at Wave 2	1.05 ^{***}	1.02, 1.09
Self-rated health at Wave 1 (Poor or fair)		
Good or excellent	1.04	0.42, 2.59

Note: Analysis $N = 267$. Variables in parenthesis are reference.

^a Includes both parents died subgroup ($N = 103$) and no data subgroup ($N = 4$).

^b A likelihood ratio test of the null hypothesis that the parameter estimate for self-esteem at wave 1 = 0 rejects the null hypothesis at $p = .048$. The Wald-based confidence interval, which is less powerful, includes 1.00.

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$