Empowering Adolescent Girls: Evidence from a Randomized Control Trial in Uganda*

Oriana Bandiera, Niklas Buehren,
Robin Burgess, Markus Goldstein, Selim Gulesci,
Imran Rasul and Munshi Sulaiman†

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Abstract

Nearly 60% of Uganda's population is aged below 20. This generation faces health challenges associated with HIV, coupled with economic challenges arising from an uncertain transition into the labor market. We evaluate the impacts of a programme designed to empower adolescent girls against both challenges through the simultaneous provision of: (i) life skills to build knowledge and reduce risky behaviors; (ii) vocational training enabling girls to establish small-scale enterprises. The randomized control trial tracks 4,800 girls over two years. We find the programme significantly improves HIV and pregnancy related knowledge, as well as corresponding risky behaviors: among those sexually active, self-reported routine condom usage increases by 50%. Furthermore, from a baseline of 21%, there is the near elimination of girls reporting having recently had sex unwillingly. On outcomes related to vocational training, the intervention raised the likelihood of girls being engaged in income generating activities by 35%, mainly driven by increased participation in self-employment. The findings suggest combined interventions might be more effective among adolescent girls than single-pronged interventions aiming to change risky behaviors solely through related education programmes, or to improve labor market outcomes solely through vocational training.

Keywords: adolescents, ELA programme, risky behaviors, vocational training.
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†Bandiera: London School of Economics and Political Science, o.bandiera@lse.ac.uk; Buehren: University College London, n.buehren@ucl.ac.uk; Burgess: London School of Economics and Political Science, r.burgess@lse.ac.uk; Goldstein: World Bank, mgoldstein@worldbank.org; Gulesci: Bocconi, selim.gulesci@unibocconi.it; Rasul: University College London, i.rasul@ucl.ac.uk; Sulaiman: BRAC International, munshi.slmn@gmail.com.

1 Introduction

The number of young people in the developing world is increasing: one billion people on the planet are aged between 15 and 24 and reside in a developing country, an increase of 17% since 1995 [World Bank 2009]. The continued rise in the numbers of young people in the global population has led policy makers to consider responses to what has now become termed the 'youth bulge' [World Bank 2007]. Indeed, dealing with such demographic trends are at the top of many developing country policy agendas, and was the focus of the World Development Report in 2007. The central policy challenge is to provide increasing numbers of young people the skills and job opportunities to enable them to lead fulfilled and economically self-reliant lives in adulthood.[1]

Figure 1 shows how the age structure of populations has changed between 2000 and 2011, by region. In Sub-Saharan Africa, there has been around a 30% increase in those aged 15-24 since 2000, with the increase being closer to 10% in the Middle East and North Africa, and South Asia.[2] In Sub-Saharan Africa these trends have meant that around 60% of the population is now aged below 25 [World Bank 2009]. In this region, the ratio of youth-to-adult unemployment is around three [ILO 2006], and as a consequence, young people are vastly over represented among the continent's unemployed. In sub-Saharan Africa, 60% of the total unemployed are aged 15-24, and on average 72% of the youth population live on less than $2 per day.

Among adolescent girls in Sub-Saharan Africa, such economic concerns are compounded by health related challenges such as early wedlock and pregnancy, exposure to STDs and HIV infection. The majority of females have married before age 24: in some countries the median age at marriage for females is in the mid teens, with the onset of motherhood following closely behind [World Bank 2009]. On HIV, Bruce and Hallman [2008] and UN [2010] report that women living in Sub-Saharan Africa aged between 15 and 24 are almost eight times more likely than men to be HIV positive, and that unprotected heterosexual intercourse together with the onward transmission of HIV to newborn and breast-fed babies is responsible for the vast majority of new HIV infections in the region.[3]

Nowhere are these twin demographic and health concerns more pronounced than Uganda, the focus of this study: around 60% of Uganda's population is aged below 20, it has the second lowest median age of all countries and the highest child dependency ratio [UN 2010]. Figure 2A highlights the extent to which the Ugandan female population is skewed towards younger age cohorts compared to the female population in more developed countries. Uganda has one of the highest rates of young women being out of the labor force: according to comparable cross-country statistics from the late 1990s, 86% of young women were out of the labor force altogether in

[1] There are a parallel set of concerns, emphasized more in the sociology and political science literatures, is that ever rising numbers and proportions of young people in developing countries will be a key factor driving alienation, social unrest and demands for political reforms, as has been observed throughout North Africa and the Middle East recently [Fuller 1995, Goldstone 2002].

[2] In the advanced economies of North America and European countries in the OECD (and to a lesser extent in Latin America), we see older age groups making up ever greater shares of the population.

[3] This is not a recent phenomena: similar ratios of HIV prevalence across genders are earlier reported by Glynn *et al.* [2001] based on random tests administered among youth populations in Kenya and Zambia.

Uganda, compared to an average of 58% in 14 Sub-Saharan countries. For those in the labor force, Figure 2B uses more recent data from the Uganda National Household Survey of 2005/2006 to construct information on unemployment rates by gender and age: we see that at all ages females have higher unemployment rates than men, and this is especially pronounced in the youngest age cohorts.[4] Finally, on health related issues, Figure 2C highlights that relative to females in the same age cohort in richer economies, fertility rates (the number of births per 1,000 women) are three to four times higher in Uganda than in developed countries, and that this gap in fertility rates is most pronounced among the youngest female aged cohort of 15 to 19 year olds.

These economic and health issues are obviously interlinked: teen pregnancy and early motherhood are likely to have a decisive impact on the ability of young girls to accumulate human capital in adolescence, and limit their future occupational choices [Attila and Field 2008, Bruce and Hallman 2008].[5] At the same time, a lack of future labor market opportunities can reduce the incentives for young girls to invest in their human capital, and be subject to other more risky behaviors. Such behaviors might ultimately increase their dependency on older men, and reduce their ability to self-determine their economic outcomes: for example, UN [2010] estimates that 10% of new HIV infections in 2010 in Uganda are linked to sex work or transactional sex.[6]

Despite the interlinkages between economic and health issues, many policy interventions have focused exclusively on classroom-based education courses designed to reduce risky behaviors, or exclusively on vocational training designed to improve labor market outcomes among youth. As a body of randomized-control trials suggest, these single-pronged programmes have met with, at best, rather mixed success [Gallant and Maticka-Tyndale 2004, Cornish and Campbell 2009, McCoy *et al.* 2010, Card *et al.* 2011].[7,8]

[4]The Uganda National Household Survey (UNHS) is a nationally representative sample of households. A two stage sampling design is used resulting in 783 Enumeration Areas (EAs) being selected. These EAs represented both the general household population and displaced population (UBOS 2005). The survey covers 7246 households.

[5]Baird *et al.* [2011] provide evidence that marriage and schooling are mutually exclusive in Malawi, and Ozier [2011] provides similar evidence from Kenya using a regression discontinuity design to identify the causal impacts of schooling on fertility. In Bangladesh, Attila and Ambrus [2008] show using age at menarche as an instrument for age at first marriage, that each additional year that marriage is delayed is associated with .3 additional years of schooling and 6.5% higher probability of literacy.

[6]Luke [2003] provides evidence on age differences across genders in sexual relations involving adolescent girls in Sub-Saharan Africa. She documents that larger age differences lower the probability of condom use. Relatedly, Robinson and Yeh [2011] provide evidence from daily diaries collected from sex workers in Busia, Kenya, to document how they change their behavior in response to health shocks among family members. They find women increase their supply of risky, better compensated sex in response to short-term health shocks at home. This is another channel through which economic pressures can exacerbate public and private health problems.

[7]On programmes related to the provision of information on reproductive practices and HIV prevention, Gallant and Maticka-Tyndale [2004] provide a review of eleven, mostly school-based HIV prevention programmes. They conclude that most programmes successfully improved knowledge and attitudes, but that the measurable impacts on *behavior* were weaker. Cornish and Campbell [2009] also document the generally weak impacts found of peer education HIV campaigns. McCoy *et al.* [2010], review eleven RCT studies of behavioral change programmes and find that only two analyses show significant protective effect on HIV incidence among women, and only three of ten studies that measured behavioral outcomes reduced any measure of HIV-related risk behavior. One a more positive note, Dupas [2011] uses an RCT design to compare the effectiveness of the Kenyan national HIV curriculum to an intervention providing information on the *relative risk* of HIV infection by the partner's age. She finds a significant and large reduction of teen pregnancies only for the informational campaign on relative riskiness.

[8]Evaluations of training programs in industrialized countries generally produce mixed results [Blundell *et al.* 2004]. In developing country settings the results from RCTs of vocational training programmes are also somewhat

In this paper we evaluate an intervention that attempts to *simultaneously* tackle the economic and health challenges faced by adolescent girls in Uganda, the *Empowerment and Livelihood for Adolescents* (ELA) programme, operated by the NGO BRAC. This programme has two prongs: (i) the provision of life skills to build knowledge and reduce risky behaviors; (ii) vocational skills training to enable adolescent girls to start small-scale income generating activities. We evaluate the programme using a randomized control trial design that measures the impact of the programme by comparing outcomes for adolescent girls who reside in 100 communities randomly-assigned to receive the ELA programme to adolescent girls that reside in 50 control communities. We survey a random sample of around 40 girls who would be eligible to participate from each community if the programme were to be offered there. Eligibility depends solely on gender and age. We use this design to estimate the impacts of the ELA programme along the two dimensions it most closely targets: health-related knowledge and risky behaviors, and engagement in income generating activities. We measure these outcomes at baseline and, for the same girls, two-years after the ELA programme is initiated in each treatment community. Our evaluation is thus based on a two-year panel of over 4800 adolescent girls.

In contrast to many of the earlier life skill programmes, this intervention is not schools-based but is delivered from designated 'adolescent development clubs' in each treated community. Hence the programme is able to target both girls that have dropped out of school, who might be especially vulnerable to engagement in risky behaviors [Bruce and Hallman 2008], as well as those currently enrolled. One potential drawback of this approach relative to classroom-based education programmes is that compliance is not assured. However we find that although participation in the programme is voluntary, there is latent demand for the services provided: take-up rates are on average 21%. Our survey therefore covers participating and non-participating girls, and we use this design to estimate the ITT and ATE impacts of the ELA programme.[9]

The results we document from the ELA programme are encouraging on both margins of girls' empowerment that are targeted by the programme. Focusing on the ITT estimates, on life skills, we find the programme caused improvements to HIV and pregnancy related knowledge, and self-reported condom usage increases by 13 percentage points (pp) among those who are sexually active. While there is no effect on reported infections with a sexually transmitted disease (STD), when infected adolescents are more likely to seek treatment at a health center. Two years after the ELA programme's initiation, adolescents living in treated villages are 3pp less likely than those in control communities to report having at least one child which corresponds to a 28.6% decrease in fertility rates among the targeted population. Moreover, the reduction in girls reporting having

mixed: Card *et al.* [2011] find little impact of such an intervention in the Dominican Republic; Attanasio *et al.* [2011] report that the Colombian *Jovenes en Accion* programme raised earnings as well as the employment rate, especially among women. A separate literature examines the impacts of business training, some elements of which are replicated in the programme we evaluate, such as financial literacy training: in contrast to our intervention these interventions are often targeted towards those that have already self-selected into small scale entrepreneurial activities. Despite this, the literature again provides generally disappointing results, as discussed later.

[9]This unmet demand for vocational training among Ugandan youth is also measured in Blattman *et al.* [2011]. They present evidence from an RCT in which youth were given unconditional and unsupervised cash transfers. Many youth chose to spend these transfers on acquiring vocational skills and tools.

had sex unwillingly is dramatic: a fall of around 17pp starting from a baseline level of 21% meaning that almost no girls resident in communities where the ELA programme operates, report being subject to such treatment. This is the clearest marker for the programme changing how empowered adolescent girls are in their relations with men.

On vocational skills, the results show that the likelihood of an adolescent girl being engaged in some income generating activity increased by 4.4pp for those residing in ELA treatment communities, corresponding to a 35% increase over baseline levels. This result is driven by additional engagement in self-employment activities. Moreover, given that both girls that have dropped out of school and those currently enrolled in school are eligible for the programme, we find no evidence that there is any adverse effect on school enrollment rates. Hence there appears to be little trade-off in promoting the empowerment of girls through health and vocational skills based interventions, and their current incentives to invest in human capital.

Within treated communities, participants and non-participants to the programme are remarkably similar at baseline. Based on observables, girls appear not to be negatively selected into actual participation based on their lack of life skills or income generating abilities. Nor do girls appear, on average, to be positively selected into participation that might have led to the programme impacts being identified from those girls whose outcomes might be on an upwards trajectory in any case. Given participation rates of 21%, when we estimate ATE impacts using treatment assignment as an instrument for participation, the estimated impacts on participants are then scaled-up by an order of magnitude.

As has become increasingly recognized in the context of HIV education programmes, such interventions are unlikely to be effective as long as the underlying economic factors that lead girls into risky behaviors are not themselves addressed [Bruce and Hallman 2008]. Our evaluation contributes to a small body of evidence providing direct evidence on this using evidence from large-scale randomized control trials. For example, Duflo *et al.* [2011] also investigate a two-pronged intervention: a school-based HIV prevention programme in Kenya coupled with subsidies to attend school. Unlike our research design, they are able to evaluate each component separately as well as the joint impacts. They find the schooling subsidy not only reduces school drop-outs but also causes a reduction in teen marriage and teen pregnancy. The HIV prevention programme when offered alone is ineffective against rates of STI or teen pregnancy although it reduces the number of unwed teenage pregnancies. Interestingly, the negative effect on early childbearing is *dampened* when the subsidy is bundled with the HIV prevention training, so that the two programme components have interesting and important interactions.

Our evidence suggests the ELA programme is at least as successful as interventions that have exclusively targeted life skills or vocational skills in similar contexts. This suggests the individual programme elements are complementary to each other: girls are more likely to take-on board health related education in terms of knowledge and behaviors when they are simultaneously offered new income generating skills. At the same time, the expected returns to providing vocational skills training to this target population might be larger when they are simultaneously provided information to help reduce their exposure to economic activities that involve risky behaviors.

The idea that improvements in income generating activities among targeted girls might feedback to further reduce risky behaviors is in line with the nascent literature using field experiments to estimate income elasticities of risky behaviors. For example, Baird *et al.* [2010] find that a cash transfer of $10 per month conditional on school attendance for adolescent girls in Malawi led to significant declines in early marriage, teenage pregnancy and self-reported sexual activity after one year. Baird *et al.* [2011] report such impacts on risky behaviors to be far larger from a cash transfer conditioned on school attendance than unconditional transfers. This again suggests that twin-pronged programmes are especially effective in reducing risky behaviors. As in our context, this might well be because the long-term efficacy of providing adolescent girls information on how to reduce their exposure to health risks, is larger when reinforced by programme components that *simultaneously* empower girls to lead economically independent lives.

Overall, the findings suggest interventions that simultaneously try to reduce informational constraints related to risky behaviors *and* reduce constraints on the provision of skills related to income generation, can have beneficial, quantitatively large and sustained impacts on adolescent girls along both dimensions. As such, the programme offers some promise to being able to enable adolescent girls to improve their life outcomes in a society facing twin challenges related to providing labor market opportunities to a rapidly rising youth population, and health challenges characterized by girls marrying and having children early in life, and a high prevalence of HIV.

The paper is organized as follows. Section 2 describes the ELA programme components and their implementation. Section 3 describes the research design, data and estimation strategy. Section 4 presents estimates of the programme's two-year impacts on risky behaviors, engagement in income generating activities, and other outcomes related to adolescent girls' welfare. Section 5 presents additional results dealing with multiple inference, impact heterogeneity and sample attrition. Section 6 concludes with a cost-benefit analysis of the programme, and a discussion of the broader implications of our findings for polices designed to address health and economic challenges facing the ever growing numbers of young people in the developing world today.

2 The ELA Programme

The Empowerment and Livelihood for Adolescents (ELA) programme is designed to improve the cognitive and non-cognitive skills of adolescent girls. The programme is implemented by the NGO, BRAC Uganda.[10] In contrast to some other school-based information campaigns on adolescent health, the ELA programme operates through 'adolescent development clubs', a fixed meeting place within each community. These clubs are often housed in a single dedicated room which is

[10]BRAC is a non-governmental organization rooted in Bangladesh. The programme design we evaluate in Uganda has been refined over a number of years based in part of BRAC's experiences with similar programmes in Bangladesh. As of December 2006, over 17,000 adolescent development clubs had been established in Bangladesh with over 300,000 of the involved adolescents having formed their own microfinance groups. BRAC Uganda was established in 2006: starting from a focus on microfinance, BRAC Uganda has developed and implemented a range of programs including health and adolescent development. The ELA programme in Uganda has now been scaled-up by BRAC to operate in Tanzania and South Sudan. Other donors have also scaled-up the ELA model to countries in Sub-Saharan Africa and South Asia.

either donated by the community or rented by BRAC. Typically, the club is open five afternoons per week and timed so that girls enrolled full-time in school can attend. Club activities are led by a female mentor. The mentor is selected by programme staff from within the community, tends to be slightly older than the target population of adolescent girls, and is prepared for her supervisory role during a week-long initiation programme, as well as bi-monthly refresher courses. Mentors obtain a small lump-sum payment for their work.[11]

Club participation is voluntary and unrelated to engagement with other BRAC activities. Eligibility is based on gender and age: only girls are permitted to participate, and the programme is intended for adolescent girls aged between 14 and 20. Given the difficulties of verifying ages in this setting and the demand for club activities arising from other girls, in practice some girls outside of the 14-20 age range also attend the clubs. The two forms of skills training provided in the ELA programme are life skills training, and vocational skills training, both of which take place within the clubs. In addition, the clubs also host popular recreational activities such as reading, staging dramas, singing, dancing and playing games. As such the clubs serve as a local space in which adolescent girls can meet, socialize, privately further discuss issues of concern and to continue to develop their non-cognitive skills.[12]

The key topics covered in the life skills training sessions include sexual and reproductive health, menstruation and menstrual disorders, pregnancy, sexually transmitted infections, HIV/AIDS awareness, family planning, rape; other sessions covered enabling topics such as management skills, negotiation and conflict resolution, and leadership among adolescents; a final class of life skills training focused on providing girls with legal knowledge on women's issues such as bride price, child marriage and violence against women. These life skills training sessions are conducted either by the trained mentors and/or BRAC's own professional staff.[13]

The vocational skills training comprises a series of courses on income generating activities. Although many of the skills are applicable for either wage or self-employment, more focus is placed on the adolescent girls establishing small-scale enterprises of their own. Courses relating to a broad range of income generating activities are provided including hair-dressing, tailoring, computing, agriculture, poultry rearing and small trades operation. Given the range of courses offered, girls self-select into those in which they have an interest or comparative advantage.[14]

The vocational training modules are taught by entrepreneurs engaged in the respective activities or by hired professionals as well as BRAC's own agriculture and livestock programme staff. These courses are supplemented by financial literacy courses covering budgeting, financial services,

[11] We also conducted a survey of mentors. Relative to adolescent girl club participants, mentors are significantly older, have significantly more years of completed schooling, but are engaged in income generating activities to the same extent. At baseline they also have better financial and self-assessed entrepreneurship skills.

[12] There is a nominal fee the girls are encouraged to pay to attend although in practice, this is often waived. Among focus groups pre-intervention, 14% of girls reported not being able to join because of the admission fee.

[13] The life skills provided overlap those studied in previous health-related education programmes [Dupas 2011, Duflo *et al.* 2011], and also with those in the separate literature on basic business training (Field *et al.* 2010, Drexler *et al.* 2010, Karlan and Valdivia 2010]. We later review our findings relative to each of these literatures.

[14] For some of the income generating activities, if the girl decides to take up the activity then they receive additional input supplies, such as seeds in agriculture, or chicks for poultry farming.

negotiation and accounting skills. The process of matching girls to income generating activities is partly demand-driven, but account is also taken of the girl's educational level, the local business environment and demand for such services.

Two further points are of note. First, given the age range of targeted girls, some of them are enrolled in school, others have graduated from secondary school, while others have dropped out. Although the clubs operate outside of school times, emphasis is still placed on ensuring girls do not drop out of school, or reduce the hours they devote to schooling, in order to take-up membership of the club and engage in its activities. We later examine the evidence of the programme having an impact on the current educational investments of participants.

Second, this evaluation examines the impacts of the programme on outcomes related to risky behaviors and income generating activities two years after the initiation of the ELA programme in treated communities. Subsequently, the programme has expanded to include a microfinance component, that offers participating adolescents the opportunity to take on credit in order to capitalize on their entrepreneurial potential and newly acquired skills during the vocational training.[15] At the time of this evaluation, adolescent club participants were unaware of the potential future offer of microfinance. BRAC staff were unaware of which clubs would be assigned to receive microfinance in addition. Thus the evaluation we conduct is based solely on the provision of life skills and vocational skills training over the first two years of the programme. As BRAC is best known for its activities in microfinance, we later confirm that the anticipation of microfinance does not drive any of our core findings.

3 Design, Data and Estimation

3.1 Research Design

We evaluate the ELA programme using a randomized control trial. The evaluation takes place during the initial phase of the programme, when it is being rolled-out across Uganda. This expansion uses the service delivery infrastructure BRAC has developed for its earlier programmes. In particular, as part of its earlier programmes, BRAC has established branch offices through the country: ten branch offices were chosen for the ELA evaluation. Five of these branches are located in the urban or semi-urban regions of Kampala and Mukono; the remaining five branches are located in the mostly rural region around Iganga and Jinja. In each branch, at least fifteen communities with the potential to host an ELA club were identified. From this list, ten locations within each branch office were randomly assigned to the receive the treatment, i.e. to set up a club and deliver the ELA programme, with the remaining five locations randomly assigned as controls. In each treatment community, a single club was opened up. Hence, the research design delivers

[15] In this second round of randomization, 50 out of the 100 treated villages were randomly assigned to additionally receive microfinance, and 50 were randomly assigned to no receive microfinance. The 50 originally assigned control communities remained as controls throughout.

100 treatment and 50 control communities, stratified by branch office.[16]

The practicalities of programme implementation led to possible non-compliance with the research design among those resident in control communities. An adolescent girl resident in a control community wishing to attend a club in a treated community is always able to do so. Such non-compliance can arise for a number of reasons. In some urban areas, the distance to the nearest club might be quite similar in treatment and control communities. In rural locations, although BRAC places much emphasis on finding suitable club locations in the center of treatment locations, inevitably some clubs are located in more peripheral village locations – due to a lack of available space in the village centre. Again in such cases, if information about the programme spreads across villages, girls from neighboring control villages are in principle able to attend a club located in a treated village. We document the extent of such non-compliance with the research design among control locations below. Of course in treated communities, as club participation is voluntary, not all eligible girls will comply with the design and decide to take-up the offer of receiving the ELA programme. We therefore later estimate both ITT and ATE impacts.

3.2 Data, Attrition and Descriptives

The primary data used for the analysis is a survey administered to adolescent girls conducted at baseline (pre-randomization), and two years after the ELA programme is initiated. The questionnaire administered to the adolescent respondents covers a range of topics including: (i) those related directly to the life skills component, such as engagement in risky behaviors, HIV related knowledge, self-confidence; (ii) those directly related to the vocational skills component, such as financial literacy, analytical ability, labor market and income generating activities; (iii) other margins such as educational investments, time use, expenditures, as well as further measures of empowerment in social and economic activities.

Prior to the baseline survey, in each of the 150 communities in the evaluation sample, a listing was drawn up of all resident adolescent girls eligible to attend the clubs. From this listing 40 girls were randomly selected to be surveyed. Baseline interviews were conducted from March to June 2008. The vast majority of ELA clubs were established between June and September 2008, and the follow-up survey was fielded from March to June 2010.

Information from 5,966 randomly survey adolescents was obtained at baseline, corresponding to around 30% of all eligible girls: 3,964 girls reside in treatment communities, and 2,002 girls in controls, with an average of 39.9 (39.7) girls being surveyed in each rural (urban) community. Despite the high degree of geographic mobility of girls in Uganda in this age range, $4,888$ adolescents were tracked to follow-up, corresponding to a two-year tracking-rate of 82%. This is comparable to tracking rates from studies in similar contexts.[17]

[16] For exposition purposes, we will refer to *communities* as the unit of randomization. For the rural branches these correspond to villages. For the branches located in urban or semi-urban regions of Kampala and Mukono, the randomized units often correspond to smaller urban areas or slums.

[17] Friedman *et al.* [2011] achieve an effective tracking rate of nearly 80% after four years for a sample of Kenyan females of similar ages to those we study. Duflo *et al.* [2011] report an attrition rate of 49% from during their

Table A1 shows the correlates of two-year attrition. The dependent variable is a dummy equal to one if the adolescent girl attrits, and we control for her community's treatment status, her individual characteristics and branch dummies. Column 1 shows that residing in a treatment community does not predict attrition. Column 2 shows this to be robust within branch, and Column 3 shows that the result holds conditioning on individual characteristics at baseline. Moreover, none of these characteristics: age, current enrollment in school, being married or having children, themselves predict attrition. Column 4 examines how individual characteristics differentially relate to attrition between treated and control communities. We find some evidence that married adolescent girls in treated locations are less likely to be tracked at follow-up, and this result continues to hold – although with less precision – when the attrition is predicted using a probit specification as shown in Column 5. We therefore later present robustness checks that account for attrition.

3.2.1 Baseline Characteristics

Table 1 shows the baseline characteristics of adolescent girls, by treatment status. Panel A focuses on demographic characteristics and shows that girls in our sample are on average 16 years old, with 71% of them being enrolled in school. Despite their age, around 6% of girls are married with 11% of all girls reporting having at least one child. All else equal, such life circumstances are likely to reduce their labor market opportunities in the future. Moreover, in this context married girls or those in relationships, are often subject to frequent unprotected sex, often with older partners, and may therefore, face a higher risk of HIV infection [Clark 2004].

Panel B relates to risky behaviors, that the first component of the ELA programme aims to shift. At baseline, girls score around 3.8 on a 0-6 scale of HIV knowledge on average, yet there is considerable variation in this metric: at the tails of the knowledge distribution, 4.89% of girls correctly answer all the questions and 2.19% provide no correct answers. 74% of them correctly answer a basic question related to pregnancy knowledge.[18] 51% of adolescent girls report always using a condom if they are sexually active. Around 14% of the girls report symptoms consistent with an STD, with just over two thirds of them subsequently having gone to a health center for treatment.[19] Finally, one dimension on which treatment and control groups differ is in the likelihood of having had sex unwillingly in the past year: this is 14% in the control group and over

follow-up six to seven years after the initial interview in their sample of female Kenyans (aged 14 at baseline). Second-round intensive tracking lifts the effective tracking rate to 89%.

[18]The HIV knowledge index is based on the number of statements correctly identified as true or false. The statements are: (i) "A person who has HIV is different from a person who is ill with AIDS"; (ii) "During vaginal sex, it is easier for a woman to receive the HIV virus than for a man"; (iii) "Pulling out the penis before a man climaxes keeps a women from getting HIV during sex"; (iv) "A women cannot get HIV if she has sex during her period"; (v) "Taking a test for HIV one week after having sex will tell a person if she or he has HIV"; (vi) "A Pregnant woman with HIV can give the virus to her unborn baby". The pregnancy knowledge indicator is based on the statement, "A women cannot become pregnant at first intercourse or with occasional sexual relations".

[19]To avoid potential biases arising from girls not wishing to report STDs, we asked girls to report if they have experienced symptoms of STDs. A list of typical symptoms were read out loud to respondents during the interview. However, this will miss asymptomatic STDs. In addition, the wording of the question was whether the girls have ever experienced the symptom, and so the time trend in the outcome cannot be negative. This does not affect the ITT estimates that are identified off differences between treatment and controls.

20% among treated girls, although the normalized difference is small. This is a key indicator for how empowered girls are in being able to control their lives.

In terms of income generating activities, the target of the second component of ELA, Panel C highlights that on a self-assessed measure of entrepreneurial ability ranging from 0 to 100 and based on answers to ten questions, the girls score quite highly at baseline, with self-assessed scores of around 70.[20] Girls are equally likely to be self-employed at baseline across treatment and control locations. Around 6.5% of girls report being self-employed, and it is this type of income generating activity the ELA programme especially focuses on developing among the adolescents. Girls are slightly more likely to be engaged in wage employment at baseline in treated communities. The final two rows show that on the intensive margin, girls are on average supplying far less than an hour per day to self and wage-employment activities.[21]

Although on most dimensions the samples are balanced between treatment and control, there are some differences relating to wage employment. Reassuringly, in these cases the normalized differences are all relatively small. As discussed in Imbens and Wooldridge [2009], the fact that none of these differences exceeds .25 suggests a linear specification is appropriate.[22]

3.2.2 Club Attendance by Follow-Up

Table 2 reports information related to participation in the adolescent development clubs measured at follow-up, two years after baseline. The first row shows that the clubs are relatively well known among respondents: as expected, awareness of the existence of the ELA programme is more widespread in treatment communities, but the fact that almost 40% of adolescents resident in control villages have heard about the clubs emphasizes that information about these activities spreads outside their immediate vicinity. As noted earlier, in some urban areas the distance to the nearest club from some pairs of treatment and control communities is similar. As a result we note that 4.7% of those in control villages have ever participated in ELA club activities in the past, as shown in the second row of Table 2. However, the participation rate in treatment communities is more than four times higher (21%). Given that attendance is entirely voluntary, this suggests there is demand for the services provided by ELA and that, at least for some girls,

[20] The entrepreneurial index consists of cumulative ranks (scaled from one to ten with ten being the highest) of the following activities: "Run your own business", "Identify business opportunities to start up new business", "Obtain credit to start up new business or expand existing business", "Save in order to invest in future business opportunities", "Make sure that your employees get the work done properly", "Manage financial accounts", "Bargain to obtain cheap prices when you are buying anything for business (inputs)", "Bargain to obtain high prices when you are selling anything for business (outputs)", "Protect your business assets from harm by others", "Collecting the money someone owes you". We then re-scale the sum of these scores to run from 0 to 100.

[21] Throughout, monetary variables are deflated and expressed in terms of the price level in January 2008 using the monthly consumer price index published by the Uganda Bureau of Statistics. In January 2008, $1 was worth approximately UGX1,700. For those few observations where month of interview was missing, the interview month most frequently observed for their peers in the same community was assumed.

[22] In terms of external validity, the rates of self-employment reported in our baseline sample match closely with those we derive for the nationally representative Uganda National Household Survey 2005/2006 based on over 7200 households. There we find that among those in the labor force, self-employment rates for 10-12 and 12-20 years olds are 7%.

the informational and skills constraints the programme seems to ease, are binding.[23]

The remaining rows report statistics *conditional* on club participation, namely these relate to the 21% of participants from treatment communities and the 5% of participants from control communities. In terms of continued involvement in the clubs, the majority of adolescents who have ever participated in ELA club activities continued their engagement until the time of the follow-up survey. The drop-out rate is significantly higher in control villages, suggesting that although it is possible to attend clubs in neighboring communities, few adolescents continue to do so in the long term. Of those participating, nearly half have attended club meetings, on average, one or two times a week, over the two years of the club's operation. Hence, over a two-year period, the intervention amounts to a considerable time investment for participants, and it is plausible that such an intense treatment causes permanent shifts in knowledge, skills and behaviors.

By the time of the follow-up, a sizeable proportion of club participants from treatment communities have taken part in the training on life skills (84.7%) and vocational skills (52.7%). The majority of girls (50.9%) report having received both forms of training; we can therefore infer that 33% take-up *only* life skills training, and 1% take-up only vocational skills training. This is in line with the two programme components being complementary for the majority of eligibles.[24]

We later present intention-to-treat estimates of the programme, that measures the impact of being offered the ELA programme. We then estimate the ATE parameters of the impact of various outcomes of having participated in the ELA using a standard approach where random assignment to treatment is used to instrument for potentially endogenous participation. Given that not all participants actually take-up the offer of both training components, the ATE remains an underestimate of the actual causal impact of attendance to the club *and* the training courses. We therefore later instrument participation into specific components of the ELA programme: attendance to the life skills courses or to the vocational training courses, with the offer of such treatment to estimate the ATE of each specific treatment.

3.3 Estimation

We first estimate the intention-to-treat (ITT) effect of the ELA programme. This assigns a treatment status to individuals depending on whether they reside in a treated or in control community, regardless of whether they actually participate in the ELA programme. As shown in Table 2, the small degree of non-compliance among girls resident in control communities is likely to bias esti-

[23] It is perhaps useful to contrast this take-up rates for those in microfinance projects. Karlan *et al.* [2010] provide evidence from two surveys and 13 interventions providing credit, savings or insurance services. They document take-up rates varying from 2 to 84% of eligibles.

[24] We have explored the possibility that these take-up rates are driven by supply side constraints rather than demand side heterogeneity (and so under plausible assumptions might be used to separately identify the impact of each component of the ELA programme). This however is not the case: in nearly all treated communities we observe: (i) some eligible girls choosing to take-up a component and other girls not doing so; (ii) the vast majority of eligible girls report life and livelihood skills training as being available even if they don't themselves take-up the course(s). In addition, we do not find school enrolment at baseline to be a significant determinant of enrolment in the vocational training component, that might otherwise have been indicative of implicit supply side constraints operating to prevent all girls from receiving the same package of ELA treatments.

mated impacts towards zero. Given random assignment of communities to treatment and control status, estimating the ITT impact of the ELA programme with OLS is straightforward using a standard difference-in-differences (DID) approach. More precisely, ELA's impact on an outcome y_{ijt} measured for adolescent i living in community j at survey wave t is estimated as follows,

$$y_{ijt} = \alpha + X_{ijt_0}\beta + time_t\tau + treat_j\gamma + (time_t \times treat_j)\,\delta + \varepsilon_{ijt}. \quad (1)$$

X_{ijt_0} is a vector of individual characteristics measured at baseline. This includes the adolescent's age, separate dummy variables for whether the respondent is enrolled in school, is married, and a dummy variable for whether she has at least one child or not. We also include a series of indicator variables for branch areas as we stratify the sample of communities by branch before randomly assigning them to treatment or control status [Bruhn and McKenzie 2009]. The indicator variable $time_t$ equals one if the observation is measured at follow-up and zero otherwise and captures natural time trends in outcomes; $treat_j$ equals one if community j is assigned to be treated and zero otherwise. This captures any potential pre-programme differences between the groups. ε_{ijt} is a disturbance term that we allow to be clustered by community j because there are likely to be common unobserved factors within communities that determine outcomes related to risky behaviors and income generating activities. δ constitutes the coefficient of interest as it measures the ELA programme's ITT impact.

The OLS specification in (1) is our base configuration. However, some outcomes related to dummy variables and other outcomes of interest are left censored, such as the number of hours devoted to self-employment. In such cases we also report ITT estimates based on non-linear Probit and Tobit specifications analogous to (1). In such non-linear estimations, the reported coefficients correspond to marginal effects. As the variable of interest, $time_t \times treat_j$, is an interaction term, this is computed in accordance with Ai and Norton [2003].[25]

The specification in (1) effectively treats the data as a repeated cross-section rather than exploiting its panel dimension. The obvious advantage of doing so is to also be able to condition on an individual fixed effect, θ_i, that captures the influence of time-invariant characteristics that drive changes in behaviors over time, such as a girl's underlying ability, motivation, time and risk preferences. In this case the error term in (1) decomposes as $\varepsilon_{ijt} = \theta_i + u_{ijt}$. As the treatment

[25] Ai and Norton [2003] report the correction for interaction terms in a Probit specification. In the case of a Tobit specification, taking into account that both interacted variables are discrete, the interaction effect on the uncensored variable y can be computed by taking the double difference,

$$\begin{aligned}\widehat{\mu_{ITT}} \;=\; & (\hat{E}[y|treatment=1, time=1, ITT=1, X, y>0] - \hat{E}[y|treatment=0, time=1, ITT=0, X, y>0]) \\ & -(\hat{E}[y|treatment=1, time=0, ITT=0, X, y>0] - \hat{E}[y|treatment=0, time=0, ITT=0, X, y>0]),\end{aligned}$$

where,

$$\begin{aligned}\hat{E}[y|treatment, time, ITT, X, y>0] \;=\; & \hat{\beta}_1 treatment + \hat{\beta}_2 time + \hat{\beta}_{12} ITT + \overline{X}\hat{\beta} \\ & + : \sigma\left[\frac{\Phi'((\hat{\beta}_1 treatment + \hat{\beta}_2 time + \hat{\beta}_{12} ITT + \hat{\beta}\overline{X})/\hat{\sigma})}{\Phi((\hat{\beta}_1 treatment + \hat{\beta}_2 time + \hat{\beta}_{12} ITT + \hat{\beta}\overline{X})/\hat{\sigma})}\right].\end{aligned}$$

The interaction effect on the probability of being uncensored can be computed analogously.

effect cannot be identified if individual fixed effects are included, we estimate a first differenced specification as follows,

$$y_{ijt_1} - y_{ijt_0} = \tau + X_{ijt_0}\pi + treat_j\delta + \varepsilon_{ijt_1} - \varepsilon_{ijt_0}, \tag{2}$$

where X_{ijt_0} is as previously defined. This specification allows the correlation between the baseline characteristics X_{ijt_0} and individual outcomes to vary over time: π captures the change over time in the corresponding β coefficient from (1). δ then remains as the coefficient of main interest as it measures the intention-to-treat impact of the ELA programme.

When estimating (2), we necessarily can only include those adolescents that are in the panel sample followed at baseline. In contrast, estimating (1) merely requires exclusion of those adolescents for whom no information on the outcome variable exists. Hence to ensure comparability of the δ estimates across specifications we report results based on the same underlying sample of adolescents, namely those that are in the panel sample. As discussed above and in Table A1, there is little evidence of differential attrition on observables across treatment and control communities.

Given that participation into the club is far from universal, the ITT estimates likely underestimate the impact of the programme on actual club participants. Our next specification attempts to estimate ATE impacts of actual participation on outcomes. Building on the first difference specification above, we consider the following estimating equation,

$$y_{ijt_1} - y_{ijt_0} = \tau + X_{ijt_0}\pi + part_{ijt_1}\delta + \varepsilon_{ijt_1} - \varepsilon_{ijt_0}, \tag{3}$$

where $part_{ijt}$ is a dummy variable which equals one if adolescent i in community j has ever participated in ELA club activities at time t. This specification is likely to lead to biased estimates of δ if participation is endogenously determined by unobserved factors that also drive changes in behavior, so that $cov(part_{ijt_1}, \varepsilon_{ijt_1} - \varepsilon_{ijt_0}) \neq 0$.

Table 3 shows how participants differ from non-participants in treatment communities. Participants are significantly less likely to be married, to report using condoms if engaged in sexual activity, and having suffered from an STD. However the normalized differences in each cases are all below .09. Moreover, on a host of other characteristics related to demographics, risky behaviors and income generating activities related to wage and self-employment, participants do not differ much on observables from non-participants. Hence, based on these observables, it is not the case that girls appear to be negatively selected into actual participation based on their lack of life skills or income generating abilities. Nor do girls appear, on average, to be positively selected into participation that might have led to the programme impacts being identified from those girls whose outcomes might be on an upwards trajectory in any case.

However, there are concerns that participants and non-participants still might differ on unobservables that also drive the outcomes of interest. We deal with this potentially endogeneity using the standard approach of instrumenting individual club participation with $treat_j$, the community treatment dummy. As shown in Table 2, girls are more likely to participate in club activities if

they live in treatment communities. The impacts are computed using a standard two-stage least squares procedure and, therefore, all coefficients are computed using a linear probability model in the first stage as favored by Angrist [2001]. In the first stage, we regress a dummy variable for participation on the treatment dummy, branch fixed effects and individual baseline characteristics X_{ijt_0}. The coefficient on the treatment dummy is .157 and is significant at the 1% level. The F-statistic from the first stage is 97.4. Under the constant treatment effect assumption, and that treatment assignment has no spillover impacts on non-participants, the IV estimates then produce the population average treatment effect on those that are induced to participate in the presence of a club in their community.

4 Main Results

This section presents the impacts of the programme on the two main sets of outcomes targeted by the programme: risky behaviors and income generating activities. For each outcome we show ITT estimates from the standard difference-in-difference OLS specification in equation (1), ITT estimates from the first difference OLS specification in equation (2), and ATE estimates from the instrumented first differenced specification in equation (3). As indicated above, these specifications are always based on the subsample of girls that are tracked to follow-up. For clarity, the results tables omit all coefficients estimated other than the estimated treatment effect, $\widehat{\delta}$.

4.1 Risky Behaviors

To benchmark the impacts of the programme along each dimension of risky behavior, the first Column in Table 4 shows the baseline value of each outcome in treated communities. Rows 1 and 2 of Table 4 show the ITT impact of the programme on knowledge indicators related to risky behaviors. The presence of an ELA club in the community significantly raises the HIV knowledge index by .465, relative to a mean at baseline of 3.82 in treated communities. On the single question related to pregnancy knowledge, this also significantly rises with the programme, by 6.3pp relative to a baseline mean of 73.9%. As such, given that the majority of girls already display sound knowledge on this dimension at baseline, the programme is able to reach those relatively few girls that were uninformed at baseline.

Improved knowledge is only a prerequisite to triggering actual behavioral change in adolescents' lives. The remaining rows of Table 4 show the programme's impact on five such indicators. First, the programme has a strong negative impact on fertility: the difference-in-difference ITT impact in Column 1 shows that the probability of having a child grows at a significant lower rate, by 2.7pp, in treated communities. Given that at baseline 10.5% of girls have at least one child, this is a near 26% drop in fertility rates over a two year time window. In line with the reduction in the incidence of child-bearing, treated adolescents report a substantial increase in condom use. Among those who are sexually active, the percentage who *always* use a condom when having

intercourse increases by 12.6pp.[26] The next row shows that this increase in those reporting always using a condom is almost equal and opposite to the reduction in those reporting using condoms often or sometimes. The next row shows that among the sexually active there is little evidence the use of other forms of contraception having increased. This is reassuring given the limited availability of such alternatives, so that the results on condom and contraceptive usage do not seem to reflect girls merely repeating what they have been taught in life skills courses, or what they believe enumerators wish to hear.

Surprisingly though, practicing safer sex through increased condom use is not mirrored in the suspected infection rate with a STD as shown in the next row, nor in significant differences in treatments sought if an STD is suspected. The first result is in line with the findings in Duflo *et al.* [2011] of the standalone provision of a HIV-curriculum.

Finally, the rate of adolescents who report having had sex unwillingly during the past year decreases by 17.1pp in treated communities. Starting from a baseline of 21% this corresponds to a near 83% reduction in the incidence of such events. This provides a dramatic illustration of the programme enabling girls to become empowered in their relations with men. This impact is likely a direct result of the life skills sessions on negotiation, rape and legal rights, through which girls are sensitized and discuss prevention measures.[27]

Column 2 of Table 4 shows all these results to be robust when estimated by OLS using the first difference specification in (2), that better accounts for the panel nature of the data and allows for the impact on outcomes of individual characteristics at baseline X_{ijt_0} to vary by time.

The last eight outcomes related to risky behaviors in Table 4 are dummy variables. Hence in Column 3 we report ITT estimates based on Probit specifications analogous to (1), and report marginal effects throughout. The earlier results are largely robust to this non-linear specification. Two differences are however of note: first, the marginal impact on using condoms if sexually active almost doubles in the Probit specification relative to the OLS specifications in levels and first-differences. Second, the results now indicate that if a girl has suffered from an STD, she is significantly more likely to go to a health center for treatment. Hence for most outcomes, accounting for the nature of the outcome variable increases the point estimates of the ITT impacts and improves their precision.

[26] As argued in Dupas [2011], childbearing is not a perfect proxy for the incidence of risky sex because: (i) adolescent girls in long-term relationships are more likely to get pregnant than girls in several short-term relationships; (ii) teenage girls might be more likely to abort if the father is a teenage boy who cannot provide economic support; (iii) adolescent girls might be more likely to engage in anal sex with partners as a way to avoid pregnancy, and this is especially risky in terms of HIV transmission. The concern that such changes in behavior might be driving fertility drops is partly ameliorated by the increased self-reported condom usage.

[27] The coefficients reported in Table 4 relate to the coefficient of interest, δ in (1). However it is also instructive to benchmark this also against the time trends in knowledge and behaviors, as measured by τ in (1). We note that on both knowledge indicators, we observed significant *reductions* in knowledge among girls over time: by $-.379$ on the HIV index, and by $-7pp$ on the pregnancy knowledge index. Whether this decline in knowledge is due to the spread of misinformation among older girls, or some other reason, is beyond the scope of this study but worthy of future research. In terms of time trends in behaviors, we note that over time, there are significant reductions in the percentage of girls who report using condoms if they are sexually active, significant increases in girls reporting having suffered an STD, and significant increases in the percentage of girls reporting having had sex unwillingly in the past year. The program impacts are all the more remarkable given this background.

The last two Columns of Table 4 present estimates of the ATE of actual participation on these outcomes related to risky behaviors. To do so, we use the first differenced specification in (3). In Column 4, the ATE estimates are based on club participation being instrumented by the offer of treatment. In Column 5 the ATE estimates are based on participation in the life skills courses being instrumented by the offer of treatment.

In both cases, the magnitude of the coefficients of interest are amplified by an order of magnitude over the ITT estimates. This is an almost mechanical consequence of the differential participation rate between adolescents in treatment and control communities. All the key OLS results discussed before remain intact when estimating the ATE impact as shown in Column 4 in Table 4: namely that on dimensions related to knowledge and practices of risky behaviors, adolescent girl outcomes significantly improve on six out of nine margins.[28]

One concern is that the outcome measures are all self-reported and so adolescent girls might merely be telling interviewers what they expect them to say. A few results point against this interpretation of the findings. First, not all margins significantly improve despite being part of the life skills training girls receive, and as discussed above, girls are not reporting increased use of contraceptive methods that are largely unavailable in this setting. Second, we have explored further outcomes related to behaviors: for example we have estimated the likelihood girls report getting married between the baseline and follow-up. This likelihood is also found to be significantly lower in treated communities relative to control locations. Delaying the onset of marriage is an important channel through which adolescent girls are able to continue to accumulate human capital and improve their long term earnings potential [Attila and Field 2008, Baird *et al.* 2011].

Comparing our findings to the literature, we note first that meta-analyses of previous interventions report generally weak impacts of standalone HIV-education programmes, be they delivered via classroom-based courses [Gallant and Maticka-Tyndale 2004, McCoy *et al.* 2010, Duflo *et al.* 2011] or peer-provided courses [Cornish and Campbell 2009]. There are two recent studies that find impacts of *standalone* education programmes that are worth comparing to. First, Arcand and Wouabe [2010] use a regression discontinuity design to estimate the impacts of a school-based HIV prevention course in Cameroon. Their estimated impacts on childbearing and condom usage lie between the ITT and ATE estimates we find. Second, Dupas [2011] uses an RCT design to compare the effectiveness of the Kenyan national HIV curriculum to an intervention providing

[28] We also experimented with augmenting the first stage specification by using additional instruments based on distance from the girls's household to the club. All else equal, one would therefore intuitively expect girls to be more likely to participate in ELA if the nearest club is located close to their home. The instrument validity, however, may be potentially undermined if the distance measure correlates with the outcome variable because, for example, the distance proxies for school and market opportunities, infrastructure or parental background. To counter this concern, we also additionally included a control variable for the distance between the adolescent's household and the nearest BRAC branch office. These offices tend to be located at a central point such as the main street in urban settings or the main trade center or town in more rural areas. The inclusion of this variable is thus intended to control for at least one potential dimension of geographical remoteness. The first stage regressions then confirmed that treatment assignment and distance to the club were significantly correlated to participation (distance to the nearest BRAC branch office had no significant impact on the likelihood of participation). Moreover, in the second stage, the estimated ATE impacts were similar for the majority of life and livelihood skills outcomes documented. However, the distance measures are computed from GPS coordinates and this spatial data is only available for a subset of respondents. Hence we focus on the ATE estimates that use only treatment assignment as an instrument.

information on the *relative risk* of HIV infection by the partner's age. She finds that exposure to this curriculum causes a 28% reduction in teenage pregnancies over a one-year period; recall that we find a 26% drop in fertility rates over a two-year time window from the ELA programme.

4.2 Income Generating Activities

Table 5 shows the programme impacts outcomes related to income generating activities. Again, to benchmark these magnitudes, the first column shows the baseline value of each outcome in treated communities. Focusing on the OLS difference-in-difference estimates of the ITT impact of the programme in Column 1, we estimate the programme impact on girls' self-reported entrepreneurial skills: an index running from 0 to 100 and based on answers to ten questions, as described earlier. This index rises significantly for those that reside in treated communities. This result is in line with girls receiving benefits, for example, from the financial skill courses that are part of the vocational training component. Figure 3A presents a spider graph showing the ITT impacts (and their associated 95% confidence interval) for each of the constituent components that go into making up the entrepreneurial skills score. We see that the programme significantly increases self-reported entrepreneurial skills along nearly every dimension.

However, we want to assess whether the programme impacts stem beyond such self-reports and into *real* economic activities of adolescents. The remaining rows of Table 5 focus on such outcomes. The second row shows that adolescent girls are 4.4pp more likely to be engaged in any income generating villages in treated communities. At baseline, 12.4% of girls were engaged in such activities. Hence the programme impact corresponds to a 35% increase in such activities. Sub-dividing income generating activities into those arising from wage employment and self-employment, the next two rows show the increase is entirely driven by the adolescent girls engaging in entrepreneurial self-employment activities. This finding is in line with expectations given the emphasis placed on developing entrepreneurship skills in the vocational training component of the ELA.

Column 2 of Table 5 shows all these results to be robust when estimated by OLS using the first difference specification in (2) that allows for time varying impacts of individuals characteristics at baseline. Column 3 also shows that the ITT results for the outcomes that are dummy variables: whether any income generating activity is engaged in, whether self-employed activities are engaged in, and whether wage employment activities are engaged in, are all robust to estimating them using a Probit specification analogous to that in (1).

The next few rows focus on the impacts on earned income and labor supply from self and wage employment. To begin with, we first report OLS estimates in Column 1 including zero values for earnings and hours. These are informative of the programmes impact on the average adolescent girl in the panel survey, including the 71% of girls that are engaged in full-time schooling at baseline. The ITT impacts on earnings – averaged over all adolescent girls – are not significantly different from zero. However, there is an increase in hours devoted to self-employment even for the average adolescent, an effect that is significant at the 10% level. Both earnings and hours outcomes are censored at zero and so are observed only if the corresponding latent outcome, y^*_{ijt}, is strictly

positive, namely $y_{ijt} = 1(y^*_{ijt} > 0).y^*_{ijt}$. Hence these OLS estimates combine the responses of those: (i) uncensored at baseline, weighted by the probability of being uncensored; and, (ii) the change in the probability of being uncensored, weighted by the expected value of the outcome if the latent variable is strictly positive.

We therefore use Tobit specifications to explore the ITT impacts on income and labor supply hours from wage and self-employment in more detail. For both income and hours the programme can potentially cause: (i) a response at the extensive margin, so that some girls *start* engaging in such activities in response to the programme; (ii) a response at the intensive margin, so that some girls that were already engaged in some income generating activity at baseline, *expand* such activities in response to the programme.

On income, Column 4 shows the programme significantly increases the likelihood that girls earn income from self-employment by 3.1pp. This measures the ITT impact on the propensity for latent earnings to be positive, $1(y^*_{ijt} > 0)$. There is no corresponding increase on the extensive margin for income from wage employment as expected. On the intensive margin, Column 5 shows that income from self-employment activities increases by almost $UGX45,500$. This measures the ITT impact on expected latent earnings, conditional on these being strictly positive, $E(y^*_{ijt}|y^*_{ijt} > 0)$. To benchmark this impact we note that among girls that were uncensored at baseline, average earnings from self-employment were $UGX368,394$ so that the programme impacts corresponds to a 12.4% increase relative to this baseline. There is no significant change in income from wage employment although the point estimate is negative, suggesting that some girls might be substituting away from wage-employment towards self-employment.

On hours worked, Column 4 shows that on the extensive margin, the programme significantly increases the likelihood that adolescent girls spend any hours engaged in self-employment activities, by 3.3%. The next row in Table 5 shows that the programme increases the daily hours worked in self-employment by .346, that is also different from zero at the 5% significance level. This starts at such a low level because, as shown in Table 1, over 70% of the girls are enrolled full-time in school at baseline. For hours of wage employment, the final row in Table 5 there are no significant changes on the extensive and intensive margins, although the point estimates are again negative, reinforcing the suggestion that for those 6% of girls that were engaged in wage-employment at baseline, there might be some substitution away from wage-employment towards self-employment as a result of the programme.

The final two Columns of Table 5 report ATE impacts of actual participation on each outcome related to income generating activities based on the instrumented first-differenced specification (3). In Column 6, the ATE estimates are based on club participation being instrumented by the offer of treatment. In Column 7 the ATE estimates are based on participation in at least one vocational skills courses being instrumented by the offer of treatment. As expected these scale-up the ITT impacts reported in Column 2. However, the estimated impacts of the programme on self-employment income are no longer precisely estimated, as was the case for the earlier OLS estimates, because both extensive and intensive margin responses are pooled together.

Given the documented ITT impacts on income generated from self-employment, it is worth

probing how such additional income is spent. The next row in Table 5 evaluates the impacts on personal consumption expenditures aggregated across eight items, in the last month.[29] Column 1 shows that in treated communities, expenditures significantly rise by around $UGX4,040$, corresponding to 33% of their baseline value, and that this result is robust to estimation using the first difference specification in Column 2. Recall that the intensive margin Tobit results in Column 4, gave an annual increase in income from self-employment of $UGX45,445$. If these monthly expenditure increases of $UGX3,009$ are constant for all twelve months of the year, then around 79% of increased income is being consumed in these categories.

In comparison with the literature, these results are encouraging as other programmes delivering standalone financial and entrepreneurship training and evaluated using RCT methods, have found generally weak impacts – see for example Field *et al.* [2010], Drexler *et al.* [2010], Karlan and Valdivia [2010], Fairlie *et al.* [2012] and Bruhn *et al.* [2012].[30] This is despite the fact that other programmes are often targeted towards those who have self-selected to be small-scale entrepreneurs. Our evidence suggests such outcomes related to business skills and outcomes can be significantly improved even among girls who *ex ante*, might not consider themselves as being on the verge of setting up a small-scale enterprise.

The second natural point of comparison is with the literature evaluating standalone vocational training. Such interventions are often found to have limited impacts in developed [Blundell *et al.* 2004] and developing country contexts [Card *et al.* 2011]. Among those studies that find impacts, Attanasio *et al.* [2012] find that for women, the likelihood to be employed increases by 6.1pp, and earnings increase by 22% relative to a randomly-assigned control group. These are comparable impacts to those we find for the two-pronged ELA intervention.

Finally, we address an important concern behind the introduction of vocational skills training: the potential adverse effect on schooling investments made by beneficiaries of the ELA programme. More precisely, the potential trade-off is that as the programme targets of school going age, adolescent girls might be encouraged to drop out of school as a result of the programme. The final few rows of Table 5 explore whether there are adverse impacts in this dimension.

The estimated ITT impact of ELA on an indicator which equals one if the respondent is currently enrolled in a school and zero otherwise is negative is statistically indistinguishable from zero.

[29] The goods categories are jewelry/ornaments, cosmetics/makeup, clothes, hairdressers, shoes/footwear, going to restaurants/bars/teashop/cafe, talk time for your mobile phone and presents/gifts.

[30] Field *et al.* [2010] report results from an RCT that provides basic financial literacy training to a randomly selected group of female entrepreneurs in India. Only a socially restricted sub-group were found to benefit from the intervention in terms of business income and borrowings. Drexler *et al.* [2010] find that teaching accounting principles to a group of micro-borrowers in the Dominican Republic has no impact on either the way they run their business nor on business outcomes. However, simple rule-of-thumb style training does affect the way in which financial records are kept. Karlan and Valdivia [2010] investigate the impact of a relatively intense training intervention of up to two years, that delivered comprehensive training on business practices to clients of a Peruvian Microfinance institution. Despite improving business knowledge, the intervention failed to impact any major business outcomes. Fairlie *et al.* [2012] find that providing entrepreneurs training has no measurable impact on business operations in the long-run. Finally, more recent evidence in Bruhn *et al.* [2012] suggests granting small and medium enterprises in Mexico access to consulting services – that are orders of magnitude more costly than the other forms of business intervention described above – does have large positive impacts on firm profits, although not their employment.

The programme does not therefore appear to have caused differential school drop-outs between treatment and control communities two years after its introduction. This finding is confirmed by the fact that the programme does not impact the number of hours spent on studying/school per week for those currently enrolled. In fact, there are hints that the programme increased the value attached to education in treated villages. The programme seems to have motivated a significantly higher proportion of 11.1% of those who have dropped-out of school in the past to at least consider going back to school.[31]

4.3 Transforming Lives?

To provide a complete picture on how the ELA programme transforms the lives of adolescent girls, we consider outcomes not directly related to risky behaviors or income generating activities, but are proxies for welfare, self-confidence and empowerment that might signal a longer term impact of the programme. The results are in Table 6.

The first row relates to the programme impacts on an index of 'gender empowerment', scaled from 0 to 100. This is based on a series of questions relating to gender roles in various tasks. A higher index value corresponds to girls believing that tasks should be gender neutral or more equally shared among genders.[32] The gender empowerment index significantly rises among girls residing in treated communities, in line with the programme's underlying aims beyond risky behaviors and income generation.

Figure 3B presents a spider graph showing the ITT impacts (and their associated 95% confidence interval) for each of the component of the empowerment index. We see that the programme significantly increases self-reported gender empowerment along a few dimensions. The programme has particularly strong impacts on attitudes along the dimension of whether girls agree with the statement that 'females should earn money for the family'. Among girls resident in treated communities, there is an increase of 18.2pp of girls agreeing with this statement, relative to a baseline of 37.2% agreeing with it.

The next index relates to attitudes, again scaled from 0 to 100. These attitudes relate to work and society.[33] On this dimension the programme has no impact. The corresponding spider graph

[31] If we focus on those girls that were not in school at baseline, we do not find a significant impact of the programme on their enrolment at follow-up.

[32] The empowerment index is a variable that cumulates the number of times a respondent answers "Both/Same" to the following questions: "Who should earn money for the family?", "Who should have a higher level of education in the family?", "Who should be responsible for washing, cleaning and cooking?", "If there is no water pump or tap, who should fetch water?", "Who should be responsible for feeding and bathing children?", "Who should help the children in their studies at home?" and "Who should be responsible for looking after the ill persons?" The other possible answers given to the respondent were "Male" and "Female". The index is then re-scaled such that 100 indicates that the respondent answered that both sexes should be responsible for the mentioned activities.

[33] The attitude index is based on the respondent's rating of the following statements: "If I start working on a task, I definitely see the end of it no matter how difficult it is", "While doing any task, it is important for me to do it better than others", "If I have the chance, I would make a good leader", "I want to be a respectful person in my village", "I do not care what others think about my success or failure", "I am in control of what happens in my life", "I save regularly", "A person can get rich by taking risks", "I often make plans for the future", "I believe that my future is determined by luck no matter how hard I work". A rating of 10 indicates that the respondent agrees with the statement a lot and 1 that the statement is not true at all for her. The index corresponds to the

for the attitude index, shown in Figure 3C shows that the programme has no impacts for any of these attitudinal measures, at least as measured two years after the programme's initiation. This result also need to be balanced against the fact that the baseline scores for the attitudes index are also relatively high and leave less margin for improvement than the gender empowerment and entrepreneurship indices.

The next few rows in Table 6 explore impacts on life satisfaction. Here the findings are somewhat mixed. On the one hand, the programme appears to have little impact on an overall index of life satisfaction, scaled to run from 0 to 100.[34] Although the baseline measure on this index is 45.1, we do not find any significant ITT or ATE impact of the ELA programme on this aggregate index. However more detail is again revealed through the corresponding spider graph for the life satisfaction index, shown in Figure 3D. This highlights that the programme impacts life satisfaction in one life sphere: satisfaction with earnings/income, a margin obviously closely connected to the programme. As reported in Table 6, satisfaction with earnings/income significantly rises by .559 on a 0 to 6 scale from a baseline level of 1.17. Along similar lines, the next row in Table 6 shows that girls significantly increase reports of never worrying about finding a good job in adulthood. This might suggest the programme is able to reduce stress levels among girls as they transit into the labor market, precisely as intended and part of the underlying motivation for the intervention.

The final Column of Table 6 reports ATE impacts of actual participation on each outcome related to these transformative margins based on the instrumented first-differenced specification (3) where club participation is instrumented by the offer of treatment. As expected these scale-up the ITT impacts reported. For participants, the implied magnitudes are large: on the gender empowerment index the ATE is greater than the baseline value, and the likelihood of not worrying about getting a good job rises by 32pp from a baseline of 42%.

5 Extended Results and Robustness Checks

5.1 Multiple Inference

The large set of outcomes analyzed on risky behaviors and income generating activities raises concerns about multiple inference, namely the probability of erroneously rejecting at least one null hypothesis of zero impact naturally increases with the number of outcomes considered. We deal with this using two approaches. First, we adjust the p-values on the ITT estimates using the free step-down procedure, detailed in Westfall and Young [1993] and Anderson [2008], to control

re-scaled cumulative score.

[34]The satisfaction index adds up the responses about the happiness of the respondent about different aspects of life, namely: education level, family, friends, job, earnings/income, house you live in, the school you go to (if currently studying), school work (if currently studying), and life as a whole. The respondents were asked to indicate their satisfaction on a scale where 1 stands for completely happy and 7 for not at all happy. For our analysis the original coding was reversed and re-scaled so that a cumulative score of 100 stands for completely happy in all aspects and 0 for not at all happy in all aspects. Analogously, the variable capturing satisfaction with earnings/income is reversed such that 6 stands for completely happy and 0 for not happy at all.

for the probability of rejecting at least one true hypothesis tested.[35]

The second approach combines several outcome variables into a single index and, thus, decreases the number of hypothesis to be tested. This method is discussed in Kling *et al.* [2007] and Anderson [2008]. We follow Kling *et al.* [2007] by re-scaling outcome variables such that higher values indicate better outcomes, demeaning the outcomes and dividing them by the standard deviation measured using the control group only, imputing missing values using the mean of the adolescent's treatment status group and constructing the index as the mean of equally weighted individual outcome variables. One such summary index is created for each of the two broad outcome domains, namely life skills and income generating activities, and then regressed on the usual set of control variables using OLS. The summary index (life skills) is based on all outcome variables in the upper panel. The summary index (IGA) is based on the entrepreneurship ability and the indicators for self-employment and wage employment.

The results are reported in Table A2. Column 1 restates the previously estimated ITT impacts on all major outcomes with their corresponding original and standard p-values shown in Column 2. The adjusted p-values using the free step-down re-sampling method intended to account for multiple inference are shown in Column 3. For most of the outcomes considered, the conservative free step-down p-values leave the key findings and interpretations intact except for the ITT impacts on pregnancy knowledge, STD proxies and hours spent on self-employment. Finally, Column 4 of Table A2 reports the p-values for the two summary indices. Together with the estimated coefficient on the time-treatment interaction term, the p-values indicate positive and significant ITT impacts of the ELA project on the two indices of risky behaviors and income generating activities.

5.2 Impact Heterogeneity

We next check for whether particular subsamples of the data are driving the main results on risky behaviors and income generating activities. To do so, we present ITT estimates on the two summary indices, derived for the multiple inference checks above, for outcomes related to risky behaviors and income generating activities. We also check for heterogeneous impacts among outcomes related to current investments in schooling. We explore impact heterogeneity along the following dimensions: (i) rural versus urban households; (ii) rich versus poor households, as defined by whether the household's asset values at baseline are above or below the median for all households; (iii) girls aged above 16 at baseline versus older girls at baseline.

Table A3 shows the results. We see that for each dimension, the impacts found are largely homogeneous across rural and urban areas, rich and poor households, and young and old girls. For the summary index for risky behaviors shown in Panel A, there is especially little evidence

[35] Following this procedure, original p-values are compared to a subset of p-values obtained for the entire family of outcome variables in each resampling iteration. This feature makes the corrected p-values more conservative than originally but less conservative than, for example, the Bonferroni or Šidák p-values which are based on an implicit comparison with the entire set of p-values contained in one family. Given that all simulated p-values within one family are based on the same treatment assignment, the dependency structure between the outcomes stays intact which substantially increases the power if outcomes are correlated as detailed in Anderson [2008]. The adjusted p-values are based on 10,000 replications under the null hypothesis of no programme impact.

of impact heterogeneity across these margins. This demonstrates, for example, that behavioral change can be induced with regards to risky behaviors among eligible girls of all ages from 12 to 20. This might not have been the case for older girls if such behavior were habitual for example. Similarly, this might not have been the case for younger girls if they particularly lacked bargaining power or negotiation skills in their relationships with men.[36]

For the summary index related to income generating activities shown in Panel B, the evidence suggests the impacts are weaker among adolescent girls in households that are wealthier at baseline, as shown in Columns 4 and 5. As such the programme reduces the gap in labor market activities between rich and poor households.

Panel C of Table A3 shows how for education related outcomes, the previously documented ITT impacts are also similar across the relevant dimensions of heterogeneity. In particular, it remains the case that the programme does not encourage girls to drop out from schooling, and this applies equally to rural and urban areas, rich and poor households, and young and old girls. This is again encouraging: if, for example, girls were especially myopic, the incentives to drop out of school in the presence of the programme might be higher in rural areas where the returns to education are limited due to a lack of labor market opportunities outside of the agricultural section [Kasirye 2011].[37]

5.3 Attrition

To check the robustness of the results to panel attrition, we re-estimate each ITT impact using weights, where these weights are constructed from the inverse of the estimated probability of panel inclusion, as also used in Duflo *et al.* [2011] and detailed in Wooldridge [2002]. The rationale behind using *inverse probability weighting* is straightforward: individuals who are very likely to have been re-interviewed receive less influence through weighting them by the inverse of the estimated probability of panel inclusion. On the other hand, adolescents likely to be under-represented in the panel receive higher weights in order to strengthen their contribution to the estimated impacts.

The key step in this procedure is a Probit regression of the dummy variable capturing panel inclusion on the usual set of control variables included in the main outcome regression as well as baseline variables with decisive influence on the panel status. The latter set of variables contains in our case dummy variables for each surveyor, the number of named friends, a measure for the distance between the village and the BRAC branch office, the household size, an indicator of whether there is at least one household member who migrated away in the last year as well as a dummy variable indicating membership in an NGO of at least one household member. From this regression predicted probabilities are obtained which are then inverted and used as weights in the

[36] The results for younger girls are especially encouraging given the conventional wisdom that girls aged 10-14, particularly those out of school, that face the greatest economic challenges and health challenges arising from unsafe sexual behavior in this context [UNICEF 2003].

[37] Kasirye [2011] reports that four out of five women in Uganda are employed in agriculture, according to the 2008 Gender and Productivity Survey in Uganda, and 42% of women in the labor force are unpaid family workers.

actual outcome regressions. The results obtained are presented in Column 5 of Table A2. These are very similar to the baseline ITT estimates shown in Column 1 so that, as suggested in Table A1, selective attrition over time is not driving the main results.

5.4 Anticipation of Microfinance

This evaluation is based on changes in behavior in the two years after the initiation of the ELA programme. In the year that followed, the programme expands to comprise a microfinance component, that offers participating adolescents the opportunity to take on desired credit in order to capitalize on their entrepreneurial potential and newly acquired skills during the vocational training. Microfinance was randomly assigned to half the treated communities after the two-year period. At the time of the current evaluation, adolescent club participants were unaware of the potential future offer of microfinance. BRAC staff were unaware of which clubs would be assigned to receive microfinance in addition. However, one concern is that the results presented here may be picking up the effects of participants' anticipating that they will receive credit, perhaps with some probability.

To check for this we focus solely on the sample of 100 treated communities and then estimate whether within this sample, the future random assignment to microfinance predicts outcomes in the first two years of the programme. We therefore estimate a specification analogous to (1) where $treat_j$ refers to whether the community will in the future receive microfinance or not: something that is observed to the researchers but not the adolescent girls nor to BRAC workers in the first two years of the programme. The coefficients on this treatment dummy variable are shown in Column 6 of Table A2 for each outcome of interest. Reassuringly we see that for each of the life skills and income generating activity outcomes, there are no significant ITT impacts of future assignment to microfinance.

6 Discussion

6.1 Cost-Benefit-Analysis

For societies facing the twin challenges of rising youth populations, and, social norms whereby girls marry and have children early and are therefore subject to risky behaviors, the ELA programme offers some promise. Given these potential benefits, it is important to document the costs of the programme. When conducting any cost-benefit analysis of an intervention that partly focuses on reducing risky behaviors and empowering adolescent girls, it is important to be clear that some of the programme benefits are not straightforward to monetize. Hence our approach is to first accurately document the cost of the programme per eligible girl, and then use this to judge how large the per girl benefits would have to be for the programme to be sustainable for a social planner. Even if the benefits of the programme outweigh the costs, this still begs the question of whether the same resources could be spent more effectively. We also discuss this issue below.

Table 7 categorizes the fixed and variable costs of the programme. The variable costs depend on the number of participating girls. Depending on whether the costs are incurred once only or recur each month, we list the amounts in Column 1 or 2 respectively. Columns 3 and 4 then split each cost into its first and second year component respectively. All costs are in US$.

Rows 1 to 3 show the costs associated with the initial programme investment of setting up a programme office, training of programme staff and programme manual development. The second set of fixed costs in Rows 4 to 14 comprise all cost items that are necessary to provide the infrastructure for the ELA clubs to function (irrespective of the number of actual club participants). Finally, Rows 15 to 19 detail the variable costs of the programme. Summing across all costs in the 100 treated communities, Row 20 shows that in year one, the programme costs $\$365,690$. This falls to $\$232,240$ in year two as some of the set-up costs are sunk and do not recur.

As described earlier in Section 3, we conducted a pre-baseline census listing of all households in the communities involved in the evaluation. This revealed that around 130 eligible adolescent girls resided in the average community. Given the benefits we document relate to ITT estimates of residing in a community that is offered the ELA programme, we use this number of eligible girls we use to calculate the per girl cost of the programme. Hence in the fourth panel of Table 7, Rows 21 and 22 show the average fixed and variable costs per eligible girl. The overall cost per eligible girl is shown in Row 23. Given our ITT estimates are measured two-years after the baseline, we focus on the second year per-girl incurred cost of \$17.9.

If the per girl benefits to an adolescent girl, of residing in a community that is offered the ELA programme, are larger than this, it would suggest the programme is sustainable from the social planner's perspective. To get a sense of the magnitude of this cost per eligible girl, we note that \$17.9 corresponds to only 0.54% of household incomes at baseline. Alternatively, this cost corresponds to 21.0% of the annual expenditures of adolescent girls on the sub-set of consumption goods described in Table 5.[38]

In terms of the documented benefits in the dimension of risky behaviors (shown in Table 4), the programme delays girls getting married, having children, improves HIV and pregnancy related knowledge, self-reported condom usage increases, and there is a dramatic reduction in girls reporting having had sex unwillingly. Table 6 reinforces these margins showing that the programme also causes significant increases on an overall index of empowerment. All of these margins are likely to lead to improvements in the lives of adolescent girls over the longer term, as suggested by other studies in similar contexts in Sub-Saharan Africa [Baird *et al.* 2011, Ozier 2011], and in Bangladesh [Attila and Ambrus 2008].

The labor market impacts of the programme are more easily monetized. On this dimension we have documented that the programme leads girls to be significantly more likely to engage in self-employment activities. The final panel of Table 7 show two alternative monetary measures of the ITT impacts of the programme for these outcomes. Row 24 shows the ITT impact of earnings from self employment to be \$2.63 two years into the programme. Row 25 shows the Tobit estimate

[38]These items include jewelry/ornaments, cosmetics/makeup, clothes, hairdressers, shoes/footwear, going to restaurants/bars/teashop/cafe, talk time for your mobile phone and presents/gifts.

for earnings conditional on earnings being strictly positive: this increase (among those girls that generate positive income from self-employment at baseline and follow-up) is $26.7 and by itself more than offsets the per girl programme cost.

Even if the benefits of the programme outweigh its costs, this then begs the question of whether the same resources could be spent more effectively. As has been emphasized throughout, the combined ELA intervention appears to improve outcomes at least as well as single-pronged interventions that have focused exclusively on classroom-based education courses designed to reduce risky behaviors, or exclusively on vocational training designed to improve labor market outcomes among youth. As a body of randomized-control trials suggest, these single-pronged programmes have met with, at best, rather mixed success [Gallant and Maticka-Tyndale 2004, Cornish and Campbell 2009, McCoy *et al.* 2010, Card *et al.* 2011].

One class of vocational training programmes that has met with some success are the *Jovenes* programmes implemented throughout Latin America. For example, Attanasio *et al.* [2012] find that for the *Jovenes* programme in Colombia, among women, the likelihood to be employed increases by 6.1pp, and earnings increase by 22% relative to a randomly-assigned control group. These are comparable impacts to those we find for the two-pronged ELA intervention. However the costs per trainee of the *Jovenes* programmes vary from $600 to $2000 per participant served [World Bank 2009]. These costs are still order of magnitude larger than the $17.9 per eligible girl of the ELA programme, or given a 21% take-up rate, a cost of $85 per participating adolescent girl.[39] Moreover, even apart from differences in programme costs, their remains doubt as to whether private sector firms in Sub-Saharan Africa would be able to currently take part in *Jovenes* style training programmes for workers.

A final approach to understanding whether the ELA programme is socially beneficial is to consider the impacts of providing unconditional cash transfers in a similar setting. This is precisely what is considered in Blattman *et al.* [2011], who present evidence from the Youth Opportunities Programme (YOP) using a randomized control trial in which youth were given unconditional and unsupervised cash transfers. They find that almost 80% of youth chose to spend these transfers on acquiring vocational skills and tools, and that the resultant increase in earnings imply an annual return on capital of 35% on average. There are of course many differences between the treated individuals in the ELA and YOP programmes: the YOP targets both genders and those aged 16 to 35; individuals form groups to apply for the unconditional transfers; the per person transfer $374. Although the ELA programme can be thought of as a constrained version of such unconditional cash transfers, even if the rates of return through labor market outcomes alone are half as much, this still compares favorably with regards to other formal sector financial investment opportunities available in Uganda in mid-2008 when the ELA programme was initiated.[40]

[39] If we also take account of the fact that 52.7% of girls regularly attending the adolescent girl club take part in the vocational training courses, then an upper bound per girl cost estimate is $161.

[40] For example, the International Financial Statistics of the IMF state that the deposit rate in the formal sector in Uganda (i.e. the rate paid by commercial banks for savings deposits) was 10.7% in 2008, 9.75% in 2009 and 7.69% in 2010. An alternative investment would have been to buy a two-year Uganda Treasury bond auctioned at the end of May 2008. It sold at a discount and yielded 14.45% according to the Bank of Uganda

6.2 Concluding Remarks

Developing countries face enormous challenges stemming from rapid population growth and a rising proportion of young people in the population. This leads naturally to the demand for policies that equip young people to effectively transit into the labor market and lead economically self-reliant lives in adulthood. Among adolescent girls, such economic concerns are compounded by social contexts characterized by early wedlock and pregnancy, where girls incentives and ability to invest in their human capital is reduced early in life and they are exposed to health risks such as HIV infection. These challenges exist across the developing world: the majority of sexually active girls aged 15-19 in the developing world are married [Bruce and Hallman 2008]. The *Demographic and Health Survey* data indicates that around 38% of the 52 million women aged 20 to 24 in developing countries were married before the age of 18 [Mensch *et al.* 2005] and these girls are often subject to unprotected sex.[41]

We have evaluated a programme, the *Empowerment and Livelihood for Adolescents* (ELA) programme operated by the BRAC NGO in Uganda, a country dealing with one of the most skewed age-pyramid structures in the world, and where adolescent girls face the severe economic challenge of finding meaningful labor market, coupled with a social context in which they face health risks from HIV and other risky behaviors. The ELA intervention is a novel advance over earlier generations of standalone interventions related to HIV-education or skills provision, in that it recognizes the interlinkage between these health and economic issues.[42]

As has become increasingly recognized in the context of HIV-education programmes, such interventions are unlikely to be effective as long as the underlying economic factors that lead girls into risky behaviors are not addressed [Bruce and Hallman 2008]. The ELA intervention thus simultaneously provides girls life skills to build knowledge and reduce risky behaviors, and provides vocational skills to enable them to start small-scale income generating activities. This twin-pronged approach is also novel in that it is not classroom based, and so targets both girls in school as well as those that have dropped out, who are often thought to be most vulnerable [Clark 2004].

We evaluate the ELA programme using a randomized control trial research design two-years after its initiation, based on a panel survey of around 4,800 adolescent girls. Our findings show that the intervention is successful in delaying marriage, childbirth and improving HIV and pregnancy related knowledge. These gains are mirrored by reductions in corresponding risky behaviors. The programmes' effectiveness is also evident in the economic sphere, with girls in treated communities being significantly more likely to engage in self-employment, and having higher earnings as a result.

(http://www.bou.or.ug/bou/collateral/tbond_forms/2008/May/tbond_28May2008.html).

[41] Of course, the fact that girls are more at-risk from health shocks such as HIV is not confined to Sub-Saharan Africa or the developing world: in developed countries adolescent girls and young women are also observed to have higher rates of HIV infection [Bruce and Hallman 2008].

[42] As reviewed in McCoy *et al.* [2010], these standalone education programmes in turn build on a first-generation of interventions based on biomedical trials, such as cervical barriers and microbicides: in general, these have not shown efficacy in randomized control trials. Male circumcision, although highly effective at preventing female-to male sexual transmission, has yet to be shown to reduce women's risk of infection.

The results show that there are positive returns to providing these girls with skills relevant for the establishment of small-scale entrepreneurial activities. This is despite the fact that the adolescent girls targeted for the programme are not self-selected in any way to be entrepreneurs. Moreover, these gains do not come at the costs of the girls' current investment in the human capital through the formal education system as we observe no reduction in those being full-time enrolled in school for example.

Taken together, the findings provide a promising indication for the effectiveness of *combining* life skills and vocational skill training in a club environment with voluntary participation. The evidence suggests the ELA programme does at least as well as many interventions that exclusively target either risky behaviors through classroom-based education behaviors, or vocational skills through vocational training courses [Gallant and Maticka-Tyndale 2004, Cornish and Campbell 2009, McCoy *et al.* 2010, Card *et al.* 2011].[43]

Overall, the findings suggest interventions that simultaneously try to reduce informational constraints related to risky behaviors *and* reduce constraints on the provision of skills related to income generation, can have beneficial, quantitatively large and sustained impacts on adolescent girls along both dimensions. As such, the programme offers some promise to policy makers, as being a low cost and scalable intervention that enables adolescent girls to improve their life outcomes. This is especially relevant in many parts of the developing world that are facing the 'youth bulge' and the need to skill and provide meaningful opportunities to their young populations. The gains to a twin-pronged ELA-style programme are especially acute among adolescent girl populations, who face similarly constrained labor market opportunities as men, but are also impacted by norms of early marriage, childbirth and engagement in risky behaviors. Absent early twin-pronged interventions that simultaneously tackle both risky behaviors and the provision of vocational skills, such cohorts may otherwise be resigned to worse life trajectories that become harder or impossible to reverse through later policy interventions.

References

[1] AI.C AND E.C.NORTON (2003) "Interaction Terms in Logit and Probit Models," *Economics Letters* 80: 123-29.

[2] AMBRUS.A AND E.FIELD (2008) "Early Marriage, Age of Menarche and Female Schooling Attainment in Bangladesh," *Journal of Political Economy* 116: 881-930.

[3] ANDERSON.M.L (2008) "Multiple Inference and Gender Differences in the Effects of Early Intervention: A Reevaluation of the Abecedarian, Perry Pre-school and Early Training Projects," *Journal of the American Statistical Association* 103: 1481-95.

[43] Cornish and Campbell [2009] document how in Africa, such peer education models in HIV related education remain the preferred approach, being used by around 60% of all major HIV prevention NGOs [Kelly *et al.* 2006].

[4] ANGRIST.J.D (2001) "Estimation of Limited Dependent Variable Models with Dummy Endogenous Regressors: Simple Strategies for Empirical Practice," *Journal of Business and Economic Statistics* 19: 2-16.

[5] ARCAND.J.L AND E.D.WAOUBE (2010) "Teaching Training and HIV/AIDS Prevention in West Africa: Regression Discontinuity Design Evidence from the Cameroon," *Health Economics* 19: 36-54.

[6] ATTANASIO.O, A.KUGLER AND C.MEGHIR (2011) "Subsidizing Vocational Training for Disadvantaged Youth in Developing Countries: Evidence from a Randomized Trial", *American Economic Journal: Applied Economics* 3: 188-220.

[7] BAIRD.S, E.CHIRWA, C.MCINTOSH AND B.OZLER (2010) "The Short-Term Impacts of a Schooling Conditional Cash Transfer Program on the Sexual Behavior of Young Women", *Health Economics* 19: 55-68.

[8] BAIRD.S, C.MCINTOSH AND B.OZLER (2010) Using Cash Transfers to Fight HIV Among Adolescent Girls: Explaining Causal Pathways With a Randomized Experiment, mimeo George Washington University.

[9] BAIRD.S, C.MCINTOSH AND B.OZLER (2011) "Cash or Condition: Evidence from the Cash Transfer Program", *Quarterly Journal of Economics* 126: 1709-53.

[10] BLATTMAN.C, N.FIALA AND S.MARTINEZ (2011) Employment Generation in Rural Africa: Mid-term Results from an Experimental Evalaution of the Youth Opportunities Program in Northern Uganda, mimeo, Yale University.

[11] BLUNDELL.R, C.MEGHIR, M.COSTA DIAS AND J.VAN REENEN (2004) "Evaluating the Employment Impact of a Mandatory Job Search Program", *Journal of the European Economic Association* 2: 569-606.

[12] BRUCE.J AND K.HALLMAN (2008) "Reaching the Girls Left Behind", *Gender and Development* 16: 227-45.

[13] BRUHN.M, D.KARLAN AND A.SCHOAR (2012) The Impact of Consulting Services on Small and Medium Enterprises: Evidence from a Randomized Trial in Mexico, mimeo Yale University.

[14] BRUHN.M AND D.MCKENZIE (2009) "In Pursuit of Balance: Randomization in Practice in Development Field Experiments," *American Economic Journal: Applied Economics* 1: 200-32.

[15] CARD.D, P.IBARRARAN, F.REGALIA, D.ROSAS-SHADY AND Y.SOARES (2011) "The Labor Market Impacts of Youth Training in the Dominican Republic," *Journal of Labor Economics* 29: 267-300.

[16] CLARK.S (2004) "Early Marriage and HIV Risks in Sub-Saharan Africa," *Studies in Family Planning* 35: 149-60.

[17] CORNISH.F AND C.CAMPBELL (2009) "The Social Conditions for Successful Peer Education: A Comparison of Two HIV Prevention Programs Run by Sex Workers in India and South Africa," *American Journal of Community Psychology* 44: 123-35.

[18] DREXLER.A, G.FISCHER AND A.SCHOAR (2010) Keeping It Simple: Financial Literacy and Rules of Thumb, CEPR Discussion Paper 7994.

[19] DUFLO.E, P.DUPAS AND M.KREMER (2011) Education, HIV and Early Fertility: Experimental Evidence from Kenya, mimeo MIT.

[20] DUPAS.P (2011) "Do Teenagers Respond to HIV Risk Information? Evidence for a Field Experiment in Kenya," *American Economic Journal: Applied Economics* 3: 1-34.

[21] FAIRLIE.R, D.KARLAN AND J.ZINMAN (2012) Behind the GATE Experiment: Evidence on Effects of and Rationales for Subsidized Entrepreneurship Training, mimeo Yale.

[22] FIELD.E, S.JAYACHANDRAN AND R.PANDE (2010) "Do Traditional Institutions Constrain Female Entrepreneurship? A Field Experiment on Business Training in India," *American Economic Review Papers and Proceedings* 100: 125-9.

[23] FRIEDMAN.W, M.KREMER, E.MIGUEL AND R.THORNTON (2011) Education as Liberation?, NBER Working Paper 16939.

[24] FULLER.G (1995) "The Demographic Backdrop to Ethnic Conflict: A Geographic Overview", in *The Challenge of Ethnic Conflict to National and International Order in the 1990s*, CIA: Washington CIA.

[25] GALLANT.M AND E.MATICKA-TYNDALE (2004) "School-Based HIV Prevention Programmes for African Youth," *Social Science and Medicine* 58: 1337-51.

[26] GLYNN.J.R, M.CARAEL, B.AUVERT, M.KAHINDO, J.CHEGE, R.MUSONDA, F.KAONA AND A.BUVE (2001) "Why Do Young Women Have a Much Higher Prevalence of HIV than Young Men?," *AIDS* 15: S51-60.

[27] GOLDSTONE.J.A (2002) "Population and Security: How Demographic Change Can LEad to Violent Conflict," *Journal of International Affair* 56: 3-23.

[28] ILO (2006) Global Employment Trends for Youth 2006, Geneva: ILO.

[29] IMBENS.G.W AND J.M.WOOLDRIDGE (2009) "Recent Developments in the Econometrics of Programme Evaluation," *Journal of Economic Literature* 47: 5-86.

[30] KARLAN.D AND J.MORDUCH AND S.MULLAINATHAN (2010) Take-up: Why Microfinance Take-up Rates Are Low and Why It Matters, Financial Access Initiative, Research Framing Note.

[31] KARLAN.D AND M.VALDIVIA (2011) "Teaching Entrepreneurship: Impact of Business Training on Microfinance Clients and Institutions," *Review of Economics and Statistics* 93: 510-27.

[32] KASIRYE.I (2011) Addressing Gender Gaps in the Ugandan Labour Market, Economic Policy Research Centre Policy Brief 12.

[33] KELLY.J.A, A.M.SOMLAI, E.G.BENOTSCH, Y.A.AMIRKHANIAN, M.I.FERNANDEZ, L.Y.STEVENSON ET AL. (2006) "Programmes, Resources and Needs of HIV-Prevention Nongovernmental Organizations (NGOs) in Africa, CEntral/Eastern Europe and Central Asia, Latin America and the Carribean," *AIDS Care* 18: 12-21.

[34] KLING.J.R, J.B.LIEBMAN AND L.F.KATZ (2007) "Experimental Analysis of Neighborhood Effects," *Econometrica* 75: 83-119.

[35] LUKE.N (2003) "Age and Economic Asymmetries in the Sexual Relationships of Adolescent Girls in Sub-Saharan Africa," *Studies in Family Planning* 34: 67-86.

[36] MCCOY.S.L, R.A.KANGWENDE AND N.C.PADIAN (2010) "Behavior Change Interventions to Prevent HIV Infection Among Women Living in Low an dMiddle Income Countries: A Systematic Review," *AIDS and Behavior* 14: 469-82.

[37] MENSCH.B.S, S.SINGH AND J.B.CASTERLINE (2005) "Trends in the Timing of First Marriage Among Men and Women in the Developing World," in C.B.Lloyd, J.R. Behrman, N.P.Stromquist and B.Cohen (eds.) *The Changing Transitions to Adulthood in Developing Countries: Selected Studies,* Washington DC: NAtional Academies Press, pp118-71.

[38] OZIER.O (2011) The Impact of Secondary Schooling in Kenya: A Regression Discontinuity Analysis, mimeo UC Berkeley.

[39] ROBINSON.J AND E.YEH (2011) "Transactional Sex as a Response to Risk in Western Kenya," *American Economic Journal: Applied Economics* 3: 35-64.

[40] UN DESA POPULATION DIVISION (2010) *World Population Prospects: The 2010 Revision Population Database.*

[41] UNAIDS (2010) *Global Report: UNAIDS Report on the Global AIDS Epidemic.*

[42] UNICEF (2003) *Africa's Orphaned Generations: A Framework to Support Orphaned Children in Sub-Saharan Africa*, Geneva: UNICEF.

[43] WORLD BANK (2007) World Development Report 2007: Development and the Next Generation, Washingtn DC: The World Bank.

[44] WORLD BANK (2009) Africa Development Indicators 2008/9: Youth and Employment in Africa, Washington DC: The World Bank.

[45] WESTFALL.P.H AND S.S.YOUNG (1993) *Resampling-Based Multiple Testing: Examples and Methods for p-value Adjustment*, John Wiley and Sons: New York.

[46] WOOLDRIGE.J.M (2002) *Econometric Analysis of Cross Section and Panel Data*, MIT Press: Cambridge MA.

Table 1: Descriptive Statistics on Adolescent Girls, By Treatment Status

Means, standard errors in parentheses, standard deviations in brackets

		Treatment	Control	Difference	Normalized Difference
		(1)	(2)	(3)	(4)
A. Demographics	Age	16.3	16.4	-.094	-.023
		[2.80]	[2.96]	(.168)	
	Currently enrolled [yes=1]	.713	.712	.0008	.001
		[.452]	[.453]	(.028)	
	Married [yes=1]	.053	.073	-.020	-.058
		[.224]	[.260]	(.014)	
	Has child(ren) [yes=1]	.105	.105	.0002	.0006
		[.307]	[.306]	(.018)	
B. Risky Behaviors	HIV knowledge [0-6 score]	3.82	3.78	.047	.027
		[1.24]	[1.24]	(.082)	
	Pregnancy knowledge [yes=1]	.739	.746	-.006	-.010
		[.439]	[.436]	(.027)	
	Has Child(ren) [yes=1]	.105	.105	.0002	.0006
		[.307]	[.306]	(.018)	
	If sexually active, always uses condom [yes=1]	.514	.514	.0004	.0006
		[.500]	[.500]	(.042)	
	Suffered from STD [yes=1]	.137	.141	-.004	-.009
		[.344]	[.348]	(.017)	
	If suffered from STD, went to health center [yes=1]	.683	.674	.009	.013
		[.466]	[.470]	(.057)	
	Had sex unwillingly in the past year [yes=1]	.205	.142	.062***	.117
		[.404]	[.350]	(.024)	
C. Income Generating Activities (IGA)	Entrepreneurial ability [0-100 score]	69.6	71.6	-1.94	-.055
		[24.6]	[25.0]	(1.78)	
	Self-employment [yes=1]	.070	.060	.010	.029
		[.255]	[.237]	(.010)	
	Wage employment [yes=1]	.057	.036	.021**	.071
		[.233]	[.186]	(.010)	
	Individual income from self-employment in the past year [in UGX]	19,665	13,099	6,567	.031
		[185,536]	[98,101]	(4,785)	
	Individual income from wage employment in the past year [in UGX]	22,768	10,197	12,572**	.049
		[245,364]	[76,387]	(5,360)	
	Hours spent on self-employment on a typical day	.483	.426	.057	.020
		[2.06]	[1.95]	(.076)	
	Hours spent on wage employment on a typical day	.704	.493	.211*	.060
		[2.67]	[2.24]	(.117)	

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors on the differences are estimated from running the corresponding least squares regression allowing for the errors to be clustered by community. The normalized difference is computed following Imbens and Wooldridge (2009). The entrepreneurial ability index is the cumulative and rescaled score aggregating the self-assessed ranks to the following activities (where 10 was the highest rank and 1 the lowest): "Run your own business", "Identify business opportunities to start up new business", "Obtain credit to start up new business or expand existing business", "Save in order to invest in future business opportunities", "Make sure that your employees get the work done properly", "Manage financial accounts", "Bargain to obtain cheap prices when you are buying anything for business (inputs)", "Bargain to obtain high prices when you are selling anything for business (outputs)", "Protect your business assets from harm by others", "Collecting the money someone owes you". The top 1% outliers of the income variables have been removed. The HIV knowledge index is based on the number of statements correctly identified as true or false. The relevant statements are "A person who has HIV is different from a person who is ill with AIDS", "During vaginal sex, it is easier for a woman to receive the HIV virus than for a man", "Pulling out the penis before a man climaxes keeps a women from getting HIV during sex", "A women cannot get HIV if she has sex during her period", "Taking a test for HIV one week after having sex will tell a person if she or he has HIV." and "A Pregnant woman with HIV can give the virus to her unborn baby". The pregnancy knowledge indicator is defined equivalently on a single statement "A women cannot become pregnant at first intercourse or with occasional sexual relations". All monetary variables are deflated and expressed in terms of the price level in January 2008 using the monthly consumer price index published by the Uganda Bureau of Statistics

Table 2: Descriptive Statistics on Adolescent Girls, By Treatment Status

Means, standard errors in parentheses, standard deviations in brackets

	Treatment	Control	Difference	Normalized Difference
	(1)	(2)	(3)	(4)
Have heard about club [yes=1]	.589	.398	.193***	.275
	[.492]	[.490]	(.030)	
Have ever participated in club activities, conditional on having heard about club [yes=1]	.206	.047	.156***	.348
	[.405]	[.212]	(.016)	
Continued participation, conditional on ever having participated [yes=1]	.630	.481	.155***	.214
	[.483]	[.503]	(.057)	
Attend(ed) club meetings at least 3 times a week, conditional on ever having participated [yes=1]	.273	.213	.053	.100
	[.446]	[.412]	(.049)	
Attend(ed) club meetings 1 or 2 times a week, conditional on ever having participated [yes=1]	.494	.400	.106	.134
	[.500]	[.493]	(.066)	
Received life skills training, conditional on ever having participated [yes=1]	.847	.795	.044	.097
	[.360]	[.407]	(.053)	
Received livelihood skills training, conditional on ever having participated [yes=1]	.527	.370	.146**	.225
	[.500]	[.486]	(.065)	
Received life and livelihood skills training , conditional on ever having participated [yes=1]	.509	.356	.144**	.220
	[.500]	[.482]	(.065)	

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors on the differences are estimated from running the corresponding least squares regression allowing for the errors to be clustered by community. The normalized difference is computed following Imbens and Wooldridge (2009). The indicators for having received life skills and/or livelihood skills are elicited from respondents' declarations to having participated in the corresponding training sessions at least very few times. Training area examples mentioned for the life skill training include learning about pregnancy or HIV. Training area examples mentioned for the livelihood training include training in hair-dressing, computer and poultry rearing.

Table 3: Descriptive Statistics on Adolescent Girls, By Participation Status

Means, standard errors in parentheses, standard deviations in brackets

		Participants	Non Participants	Difference	Normalized Difference
		(1)	(2)	(3)	(4)
A. Demographics	Age	16.2	16.4	-.150	-.038
		[2.82]	[2.80]	(.133)	
	Currently enrolled [yes=1]	.716	.712	.004	.006
		[.451]	[.453]	(.025)	
	Married [yes=1]	.039	.056	-.017*	-.057
		[.194]	[.231]	(.009)	
	Has child(ren) [yes=1]	.093	.108	-.015	-.036
		[.290]	[.311]	(.014)	
B. Risky Behaviors	HIV knowledge [0-6 score]	3.84	3.82	.022	.012
		[1.31]	[1.22]	(.065)	
	Pregnancy knowledge [yes=1]	.754	.735	.019	.031
		[.431]	[.441]	(.021)	
	If sexually active, always uses condom [yes=1]	.562	.502	.060*	.085
		[.497]	[.500]	(.035)	
	Suffered from STD [yes=1]	.161	.130	.031*	.062
		[.368]	[.337]	(.017)	
	If suffered from STD, went to health center [yes=1]	.654	.691	-.037	-.056
		[.479]	[.463]	(.064)	
	Had sex unwillingly in the past year [yes=1]	.177	.212	-.036	-.063
		[.382]	[.409]	(.030)	
C. Income Generating Activities (IGA)	Entrepreneurial ability [0-100 score]	68.5	69.9	-1.42	-.041
		[23.9]	[24.7]	(1.26)	
	Self-employment [yes=1]	.068	.070	-.002	-.006
		[.252]	[.256]	(.011)	
	Wage-employment [yes=1]	.055	.058	-.003	-.010
		[.228]	[.234]	(.009)	
	Individual income from self-employment in the past year [in UGX]	14,614	20,978	-6,364	-.027
		[126,634]	[197,990]	(6,818)	
	Individual income from wage employment in the past year [in UGX]	34,112	19,821	14,290	.032
		[399,440]	[185,477]	(15,537)	
	Hours spent on self-employment on a typical day	.448	.492	-.044	-.015
		[1.94]	[2.09]	(.083)	
	Hours spent on wage employment on a typical day	.714	.702	.013	.003
		[2.65]	[2.67]	(.114)	

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors on the differences are estimated from running the corresponding least squares regression allowing for the errors to be clustered by community. The normalized difference is computed following Imbens and Wooldridge (2009). The entrepreneurial ability index is the cumulative and rescaled score aggregating the self-assessed ranks to the following activities (where 10 was the highest rank and 1 the lowest): "Run your own business", "Identify business opportunities to start up new business", "Obtain credit to start up new business or expand existing business", "Save in order to invest in future business opportunities", "Make sure that your employees get the work done properly", "Manage financial accounts", "Bargain to obtain cheap prices when you are buying anything for business (inputs)", "Bargain to obtain high prices when you are selling anything for business (outputs)", "Protect your business assets from harm by others", "Collecting the money someone owes you". The top 1% outliers of the income variables have been removed. The HIV knowledge index is based on the number of statements correctly identified as true or false. The relevant statements are "A person who has HIV is different from a person who is ill with AIDS", "During vaginal sex, it is easier for a woman to receive the HIV virus than for a man", "Pulling out the penis before a man climaxes keeps a women from getting HIV during sex", "A women cannot get HIV if she has sex during her period", "Taking a test for HIV one week after having sex will tell a person if she or he has HIV." and "A Pregnant woman with HIV can give the virus to her unborn baby". The pregnancy knowledge indicator is defined equivalently on a single statement "A women cannot become pregnant at first intercourse or with occasional sexual relations".

Table 4: The Impact of the ELA Programme on Risky Behaviors

Coefficients, standard errors in parentheses, standard deviations in brackets in Column on Baseline Levels

Outcome	Baseline Levels	ITT Estimates			ATE Estimates	
		(1) OLS, Level	(2) OLS, FD	(3) Probit, Marginal Effects	(4) IV, Club Participation, FD Treatment as IV	(5) IV, Life Skill Training, FD Treatment as IV
HIV knowledge [0-6 score]	3.82	.465***	.424***		2.71***	3.13***
	[1.24]	(.110)	(.072)		(.513)	(.608)
Pregnancy knowledge [yes=1]	.739	.063**	.059**	.069**	.370**	.426**
	[.439]	(.031)	(.028)	(.032)	(.178)	(.207)
Has child(ren) [yes=1]	.105	-.027**	-.029**	-.030***	-.182**	-.211**
	[.307]	(.012)	(.011)	(.009)	(.075)	(.087)
If sexually active, always uses condom [yes=1]	.514	.126**	.127***	.259***	.655**	.911**
	[.500]	(.057)	(.048)	(.049)	(.256)	(.358)
If sexually active, uses often or sometimes condom [yes=1]	.227	-.109**	-.107**	-.250***	-.555**	-.771**
	[.420]	(.054)	(.050)	(.041)	(.263)	(.372)
If sexually active, uses other contraceptives [yes=1]	.148	.038	.035	.075*	.179	.249
	[.356]	(.059)	(.041)	(.041)	(.213)	(.294)
Suffered from STD [yes=1]	.137	-.005	-.007	-.001	-.040	-.046
	[.344]	(.026)	(.022)	(.024)	(.129)	(.149)
If suffered from STD, went to health center [yes=1]	.683	.102	.126	.139**	.566	.677
	[.466]	(.119)	(.112)	(.060)	(.496)	(.599)
Had sex unwillingly [yes=1]	.205	-.171***	-.167***	-.138***	-.670***	-.834***
	[.404]	(.043)	(.041)	(.032)	(.187)	(.236)

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by community. The control variables include the age of the respondents as well as dummies for being enrolled, having at least one child and being married. The HIV knowledge index is based on the number of statements correctly identified as true or false. The relevant statements are "A person who has HIV is different from a person who is ill with AIDS", "During vaginal sex, it is easier for a woman to receive the HIV virus than for a man", "Pulling out the penis before a man climaxes keeps a women from getting HIV during sex", "A women cannot get HIV if she has sex during her period", "Taking a test for HIV one week after having sex will tell a person if she or he has HIV." and "A Pregnant woman with HIV can give the virus to her unborn baby". The pregnancy knowledge indicator is defined equivalently on a single statement "A women cannot become pregnant at first intercourse or with occasional sexual relations". In Column 4, the ATE estimates are based on club participation being instrumented by the offer of treatment. In Column 5 the ATE estimates are based on participation in the life skills courses being instrumented by the offer of treatment.

Table 5: The Impact of the ELA Programme on Income Generating Activities

Coefficients, standard errors in parentheses

		ITT Estimates					ATE Estimates	
Outcome	**Baseline Levels**	**(1) OLS, Level**	**(2) OLS, FD**	**(3) Probit, Marginal Effects**	**(4) Tobit [Pr(y*>0)]**	**(5) Tobit [E[y*|y*>0]**	**(6) IV, Club Participation, FD Treatment as IV**	**(7) IV, Livelihood Training, FD Treatment as IV**
Entrepreneurial ability [0-100 score]	69.6	7.64**	7.28***				45.9***	83.7***
	[24.6]	(3.10)	(1.54)				(11.3)	(19.9)
Engaged in any IGA [yes=1]	.124	.044**	.049**	.034*			.311**	.562**
	[.330]	(.021)	(.019)	(.018)			(.121)	(.220)
Self-employment [yes=1]	.070	.053***	.054***	.044***			.345***	.625***
	[.255]	(.015)	(.014)	(.012)			(.092)	(.170)
Wage employment [yes=1]	.057	-.010	-.007	-.012			-.045	-.082
	[.233]	(.012)	(.010)	(.008)			(.065)	(.118)
Individual total income past year from self-employment [in UGX]	19,665	4,463	1,893		.031***	45,445***	12,104	21,958
	[185,536]	(10,246)	(9,471)		(.008)	(15,819)	(60,244)	(109,085)
Individual total income past year from wage employment [in UGX]	22,768	-8,883	-5,476		-.005	-21,811	-34,925	-63,233
	[245,364]	(8,865)	(7,506)		(.005)	(21,823)	(47,952)	(86,994)
Hours spent on self-employment on a typical day	.483	.220*	.205*		.033***	.346**	1.31*	2.36*
	[2.06]	(.119)	(.112)		(.012)	(.173)	(.710)	(1.30)
Hours spent on wage employment on a typical day	.704	-.164	-.092		-.017	-.410	-.589	-1.07
	[2.67]	(.135)	(.107)		(.010)	(.289)	(.688)	(1.24)
Expenditure on goods in the last month [in UGX]	12,397	4,040***	3,714***		.081***	3,009***	23,653***	42,480***
	[19,181]	(1,506)	(1,196)		(.027)	(919)	(7,466)	(13,585)
Currently enrolled [yes=1]	.713	-.014	-.005	-.018			-.034	-.062
	[.452]	(.025)	(.021)	(.031)			(.133)	(.240)
If enrolled, hours spent on going to and attending school, homework and study per week	61.9	.739	-.315				-2.19	-2.65
	[18.2]	(2.71)	(1.40)				(9.69)	(11.7)
If dropped out, plan to start/go back to school [yes=1]	.522	.086	.111**	.117**			.700**	1.28**
	[.500]	(.053)	(.049)	(.046)			(.346)	(.630)

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by community. The control variables include the age of the respondents as well as dummies for being enrolled, having at least one child and being married. The entrepreneurial ability index is the cumulative and rescaled score aggregating the self-assessed ranks to the following activities (where 10 was the highest rank and 1 the lowest): "Run your own business", "Identify business opportunities to start up new business", "Obtain credit to start up new business or expand existing business", "Save in order to invest in future business opportunities", "Make sure that your employees get the work done properly", "Manage financial accounts", "Bargain to obtain cheap prices when you are buying anything for business (inputs)", "Bargain to obtain high prices when you are selling anything for business (outputs)", "Protect your business assets from harm by others", "Collecting the money someone owes you". The top 1% outliers of the income variables have been removed. For the expenditure variable, the goods categories are jewelry/ornaments, cosmetics/makeup, clothes, hairdressers, shoes/footwear, going to restaurants/bars/teashop/cafe, talk time for your mobile phone and presents/gifts. All monetary variables are deflated and expressed in terms of the price level in January 2008 using the monthly consumer price index published by the Uganda Bureau of Statistics. In Column 6, the ATE estimates are based on club participation being instrumented by the offer of treatment. In Column 7 the ATE estimates are based on participation in at least one livelihood skills courses being instrumented by the offer of treatment.

Table 6: The Impact of the ELA Programme on Other Measures

Coefficients, standard errors in parentheses

		ITT Estimates			ATE Estimates
	Baseline Levels	**(1) OLS, Level**	**(2) OLS, FD**	**(3) Probit, Marginal Effects**	**(4) IV, Club Participation, FD Treatment as IV**
Gender empowerment index [0,100]	28.5	5.78**	6.12***		39.1***
	[24.2]	(2.59)	(1.59)		(10.9)
Attitude Index [0,100]	75.6	1.88	1.82		11.5
	[19.5]	(2.50)	(1.49)		(9.69)
Satisfaction index [0,100]	45.1	.121	-.343		-2.17
	[17.9]	(1.33)	(.917)		(5.78)
Satisfaction with earnings/income [0,6]	1.17	.559*	.486**		3.71**
	[1.70]	(.331)	(.190)		(1.52)
Never worry to get a good job in adulthood [yes=1]	.418	.062*	.052*	.065*	.321*
	[.493]	(.033)	(.027)	(.035)	(.169)

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by community. The control variables include the age of the respondents as well as dummies for being enrolled, having at least one child and being married. The gender empowerment index is a variable that cumulates the number of times a respondent asswers "Both/Same" to the following questions: "Who should earn money for the family?", "Who should have a higher level of education in the family?", "Who should be responsible for washing, cleaning and cooking?", "If there is no water pump or tap, who should fetch water?", "Who should be responsible for feeding and bathing children?", "Who should help the children in their studies at home?" and "Who should be responsible for looking after the ill persons?" The other possible answers given to the respondent were "Male" and "Female". The index is then rescaled such that 100 indicates that the respondent answered that the female should be (at least partly) be responsible for all the activities. For the attitudes index, the adolescents were asked to rate how much they think that the following statements are true or false for them. On a scale of 1-10, where 1 is "not at all" and 10 is "a lot" (clockwise, begining with the spoke on top): "If I start working on a task, I definitely see the end of it no matter how difficult it is", "While doing any task, it is important for me to do it better than others", "If I have the chance, I would make a good leader", "I save regularly", "I do not care what others think about my success or failure", "I am in control of what happens in my life", "I want to be a respectful person in my village", "A person can get rich by taking risks", "I often make plans for the future", and "I believe that my future is determined by luck no matter how hard I work." The index is then rescaled to run from 0 to 100. The satisfaction index adds up the responses about the happiness of the respondent about different aspects of life, namely: "Your education level", "Your family", "Your friends", "Your job", "Your earnings/income", "The house you live in", "(If currently studying) The school you go to", "(If currently studying) Your school work", "Life as a whole". Originally, the respondents were asked to indicate their satisfaction on a scale where 1 stands for completely happy and 7 for not at all happy. For our analysis the original coding was reversed and rescaled so that a cumulative score of 100 stands for completely happy in all aspects and 0 for not at all happy in all aspects. Analogously, the variable capturing satisfaction with earnings/income is reversed such that 6 stands for completely happy and 0 for not happy at all.

Table 7: Cost-Benefit Analysis, in US$

				(1) Non-Recurring	(2) Recurring Monthly	(3) Year One	(4) Year Two
Fixed Costs	(1)	Office Space & Equipment	10 Branch Offices	4,000		4,000	
	(2)	Programme Assistant Training	10 Assistants	2,250		2,250	
	(3)	Training & Operational Material Development	2 Manuals	4,000		4,000	
	(4)	Programme Management Compensation	2 Coordinators		780	9,360	9,360
	(5)	Programme Assistant Compensation	10 Assistants		1,690	20,280	20,280
	(6)	Adolescent Leader Compensation	100 Adolescent Leaders		1,200	14,400	14,400
	(7)	Adolescent Leader Training	100 Adolescent Leaders	22,500		22,500	
	(8)	Adolescent Leader Training (for Replacements)	20 Adolescent Leaders	4,500			4,500
	(9)	Adolescent Leader Refreshers	100 Adolescent Leaders		400	4,800	4,800
	(10)	Club Rent	100 Clubs		1,000	12,000	12,000
	(11)	Club Materials	100 Clubs	42,000		42,000	
	(12)	Club Materials (Replenishment)	100 Clubs	16,800			16,800
	(13)	Branch Office Overhead	10 Branch Offices		800	9,600	9,600
	(14)	Country Office Overhead	1 Country Office		4,000	48,000	48,000
Variable Costs	(15)	Financial Literacy Courses	2,500 Members	12,500		12,500	12,500
	(16)	Livelihood Training (Year 1)	2,000 Members	100,000		100,000	
	(17)	Livelihood Training Inputs (Year 1)	2,000 Members	60,000		60,000	
	(18)	Livelihood Training (Year 2)	1,000 Members	50,000			50,000
	(19)	Livelihood Training Inputs (Year 2)	1,000 Members	30,000			30,000
Total Costs	(20)	**ELA Programme Costs for the 100 studied Communities**				**365,690**	**232,240**
Yearly Per Unit Average Costs	(21)	Assuming 130 potential girl attendees per club	Fixed Costs			14.9	10.7
	(22)		Variable Costs			13.3	7.12
	(23)		Total Costs			28.1	17.9
Yearly Benefits	(24)	ITT Impact of ELA on Individual total Income past Year from Self-Employment (OLS, Level)					2.63
	(25)	ITT Impact of ELA on Individual total Income past Year from Self-Employment (Tobit, E[y*|y*>0])					26.7***

Notes: *** indicates that the coefficient/marginal effect on which the estimate is based is significant at 1%, ** at 5%, and * at 10%. The exchange rate used to convert monetary values is based on January 2008 at which point $1 was worth approximately UGX1,700. The yearly costs shown in Columns 3 and 4 are obtained by multiplying column 2 times 12 (months) and adding Column 1 for all fixed and variable cost categories applicable to the respective year of operation. The yearly total cost of the ELA Programme stated in row 20 is the summation of all individual cost items applicable to the respective year. The yearly benefits shown in row 24 to 25 are based on the ITT impact estimates shown before.

Table A1: Correlates of Two-Year Attrition

Dependent Variable: In Panel Sample [yes=1]

OLS estimates in Columns 1-4, Probit estimate in Column 5

Standard errors clustered by community

	(1)	(2)	(3)	(4)	(5) Probit
Treatment	.025	.026	.026	-.019	-.042
	(.029)	(.027)	(.027)	(.100)	(.093)
Age			-.0002	-.0009	-.002
			(.002)	(.004)	(.004)
Currently enrolled [yes=1]			.015	-.013	-.028
			(.015)	(.029)	(.030)
Married [yes=1]			-.0002	.059	.056
			(.023)	(.037)	(.037)
Has child(ren) [yes=1]			.025	-.005	-.014
			(.020)	(.033)	(.035)
Treatment x age				.0010	.002
				(.005)	(.005)
Treatment x currently enrolled [yes=1]				.041	.046
				(.038)	(.039)
Treatment x married [yes=1]				-.097**	-.110*
				(.048)	(.068)
Treatment x has child(ren) [yes=1]				.045	.036
				(.043)	(.039)
Branch Dummies	No	Yes	Yes	Yes	No
Observations	5,661	5,661	5,661	5,661	5,661

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variable is a dummy equal to one if the adolescent girl attrits between the baseline survey and the two-year follow-up survey. The standard errors are clustered by community. Columns 1 to 4 are estimated using a linear probability model. Column 5 is estimated using a probit model, where marginal effects are reported. There are ten branch dummies controlled for in Columns 2 to 4.

Table A2: Robustness Checks

Marginal effects, standard errors in parentheses, p-values

			P-Value Correction for Multiple Inference			Sample Attrition	Anticipation of Microfinance
		(1) Baseline ITT Estimates	(2) Original	(3) Step-Down	(4) Summary Index	(5) Weighted ITT Estimates Adjusting for Attrition	(6) ITT Estimate on Future Assignment to Microfinance
A. Risky Behaviors	HIV knowledge [scale 0,6]	.485***	.00002	.0005		.497***	.108
		(.111)				(.112)	(.136)
	Pregnancy knowledge [yes=1]	.069**	.029	.150		.057*	.016
		(.032)				(.032)	(.037)
	Has child(ren) [yes=1]	-.030***	.001	.017		-.029***	.008
		(.009)				(.009)	(.012)
	If sexually active, always uses condom [yes=1]	.259***	.00000	.00000		.256***	.004
		(.049)				(.051)	(.065)
	Suffered from STD [yes=1]	-.001	.957	.956		-.003	.024
		(.024)				(.026)	(.031)
	If suffered from STD, went to health center [yes=1]	.139**	.022	.145		.112*	-.069
		(.060)				(.064)	(.069)
	Had sex unwillingly [yes=1]	-.138***	.00002	.0005		-.130***	-.037
		(.032)				(.034)	(.038)
	Summary Index (Risky Behaviors)	.206***			.000		
		(.028)					
B. Income Generating Activities (IGA)	Entrepreneurial ability [0-100 score]	8.21***	.009	.082		8.64***	-1.75
		(3.12)				(3.08)	(3.72)
	Self-employment [yes=1]	.044***	.0003	.006		.044***	-.012
		(.012)				(.013)	(.018)
	Wage employment [yes=1]	-.012	.142	.362		-.011	-.004
		(.008)				(.008)	(.012)
	Individual total income past year from self-employment [in UGX]	45,445***	.004	.043		49,435***	9,089
		(15,819)				(16,109)	(18,150)
	Individual total income past year from wage employment [in UGX]	-21,811	.318	.544		-22,925	4,968
		(21,823)				(22,401)	(24,277)
	Hours spent on self-employment on a typical day	.346**	.045	.180		.334*	-.095
		(.173)				(.183)	(.213)
	Hours spent on wage employment on a typical day	-.410	.156	.363		-.395	-.156
		(.289)				(.302)	(.317)
	Summary Index (IGA)	.156***			.003		
		(.052)					

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by community. The control variables include the age of the respondents as well as dummies for being enrolled, having at least one child and being married. The entrepreneurial ability is an index consisting of cumulative ranks (scale from one to ten with ten being the highest) of the following activities: "Run your own business", "Identify business opportunities to start up new business", "Obtain credit to start up new business or expand existing business", "Save in order to invest in future business opportunities", "Make sure that your employees get the work done properly", "Manage financial accounts", "Bargain to obtain cheap prices when you are buying anything for business (inputs)", "Bargain to obtain high prices when you are selling anything for business (outputs)", "Protect your business assets from harm by others", "Collecting the money someone owes you". The top 1% outliers of the income variables have been removed. The HIV knowledge index is based on the number of statements correctly identified as true or false. The relevant statements are "A person who has HIV is different from a person who is ill with AIDS", "During vaginal sex, it is easier for a woman to receive the HIV virus than for a man", "Pulling out the penis before a man climaxes keeps a women from getting HIV during sex", "A women cannot get HIV if she has sex during her period", "Taking a test for HIV one week after having sex will tell a person if she or he has HIV." and "A Pregnant woman with HIV can give the virus to her unborn baby". The pregnancy knowledge indicator is defined equivalently on a single statement "A women cannot become pregnant at first intercourse or with occasional sexual relations". The summary index (life skills) is based on all outcome variables in the upper panel. The summary index (IGA) is based on the entrepreneurship ability and the indicators for self-employment and wage employment. All monetary variables are deflated and expressed in terms of the price level in January 2008 using the monthly consumer price index published by the Uganda Bureau of Statistics.

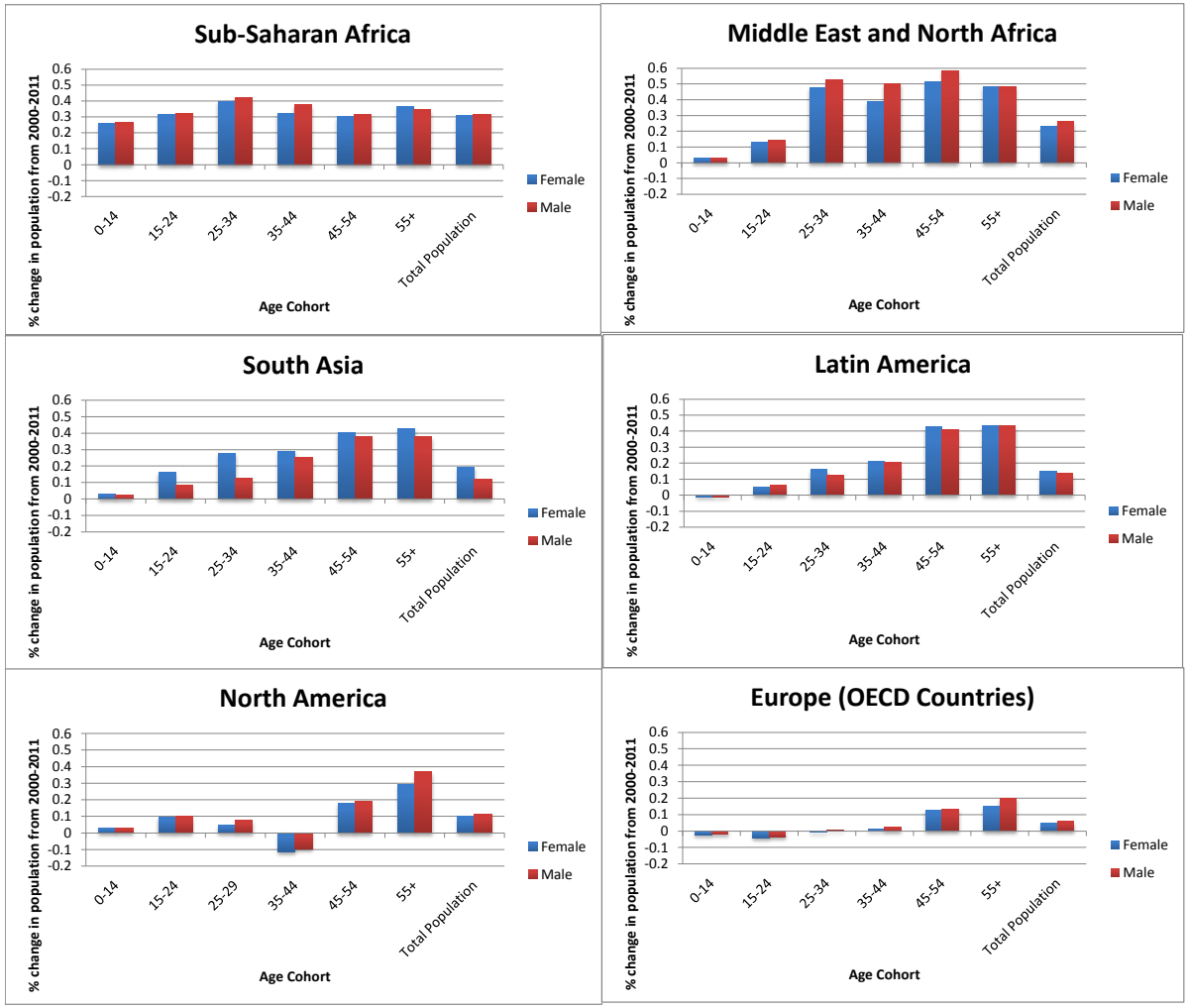
Table A3: Impact Heterogeneity

Marginal effects, standard errors in parentheses, p-values

		(1) Baseline ITT Estimates	(2) Rural	(3) Urban	(4) Above Median HH Asset Value	(5) Below Median HH Asset Value	(6) Younger than 16yrs	(7) 16yrs or older
A. Riskty Behaviors	Summary Index (Risky Behaviors)	.206***	.164***	.251***	.163***	.250***	.244***	.196***
		(.028)	(.029)	(.042)	(.035)	(.031)	(.045)	(.030)
B. Income Generating Activities (IGA)	Summary Index (IGA)	.156***	.154***	.152**	.044	.250***	.160**	.140**
		(.052)	(.056)	(.066)	(.057)	(.064)	(.065)	(.059)
C. Education	Currently enrolled [yes=1]	-.018	-.034	-.003	-.031	-.002	.027	-.060
		(.031)	(.044)	(.040)	(.032)	(.048)	(.024)	(.044)
	Hours spent on going to and attending school, homework and study per week	1.69	-.470	3.86*	2.99	.533	-.218	3.62
		(2.62)	(4.84)	(2.20)	(2.95)	(2.98)	(3.00)	(2.79)
	If dropped out, plan to start/go back to school [yes=1]	.117**	.132**	.107*	.046	.148***	.327***	.098**
		(.046)	(.063)	(.062)	(.069)	(.055)	(.119)	(.048)

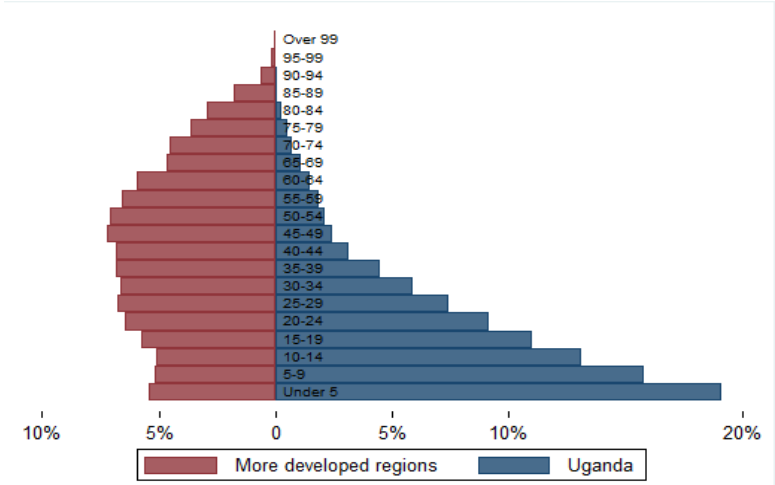
Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by community. The control variables include the age of the respondents as well as dummies for being enrolled, having at least one child and being married. The entrepreneurial ability is an index consisting of cumulative ranks (scale from one to ten with ten being the highest) of the following activities: "Run your own business", "Identify business opportunities to start up new business", "Obtain credit to start up new business or expand existing business", "Save in order to invest in future business opportunities", "Make sure that your employees get the work done properly", "Manage financial accounts", "Bargain to obtain cheap prices when you are buying anything for business (inputs)", "Bargain to obtain high prices when you are selling anything for business (outputs)", "Protect your business assets from harm by others", "Collecting the money someone owes you". The top 1% outliers of the income variables have been removed. The HIV knowledge index is based on the number of statements correctly identified as true or false. The relevant statements are "A person who has HIV is different from a person who is ill with AIDS", "During vaginal sex, it is easier for a woman to receive the HIV virus than for a man", "Pulling out the penis before a man climaxes keeps a women from getting HIV during sex", "A women cannot get HIV if she has sex during her period", "Taking a test for HIV one week after having sex will tell a person if she or he has HIV." and "A Pregnant woman with HIV can give the virus to her unborn baby". The pregnancy knowledge indicator is defined equivalently on a single statement "A women cannot become pregnant at first intercourse or with occasional sexual relations". The summary index (life skills) is based on all outcome variables in the upper panel. The summary index (IGA) is based on the entrepreneurship ability and the indicators for self-employment and wage employment. All monetary variables are deflated and expressed in terms of the price level in January 2008 using the monthly consumer price index published by the Uganda Bureau of Statistics. The rural sample comprises respondents from BRAC's Njeru, Iganga, Busia, Bugembe and Buwenge areas. Protein intake is derived from the indicated household consumption of eggs, fish and meat.

Figure 1: Percentage Change in Population Between 2000 and 2011, by Age Group, Gender and Region



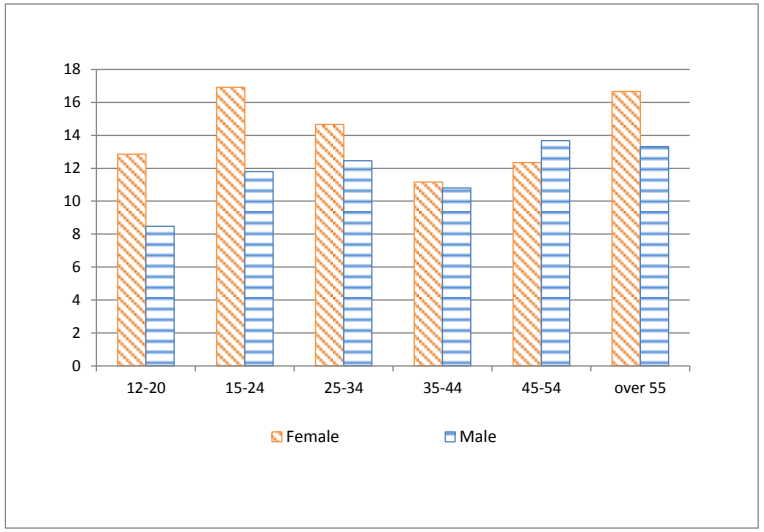
Notes: The population data is from the Health, Nutrition and Population Statistics Database from the World Bank DataBank: http://data.worldbank.org/ (accessed October 2012). Sub Saharan Africa includes: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Dem. Rep. of Congo, Cote d'Ivoire, Equatorial Guinea, Eritrea, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia and Zimbabwe. Sub Saharan Africa excludes figures for Seychelles and South Sudan that are unavailable. The Middle East and North Africa (MENA) includes Algeria, Bahrain, Djibouti, Arab Republic of Egypt, Islamic Republic of Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Saudi Arabia, Arab Republic of Syria, Tunisia, United Arab Emirates and the Republic of Yemen. MENA excludes figures for West Bank and Gaza that are unavailable. South Asia includes figures for Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Latin America includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela. North America includes the United States and Canada, and excludes Bermuda. Europe includes OECD European countries: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, and the United Kingdom.

Figure 2A: Female Population by Age, 2010



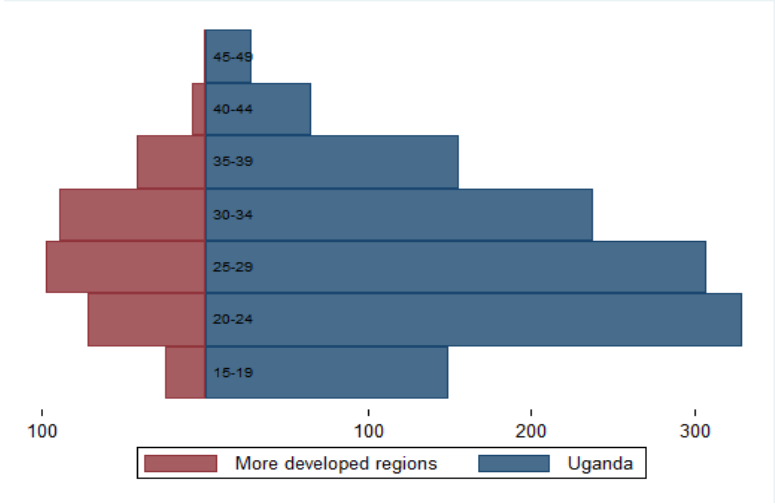
Notes: The data stems from the 2010 UN World Population Prospects data base. More developed regions comprise Europe, Northern America, Australia/New Zealand and Japan.

Figure 2B: Unemployment Rates (%), by Age and Gender, Uganda 2005/6



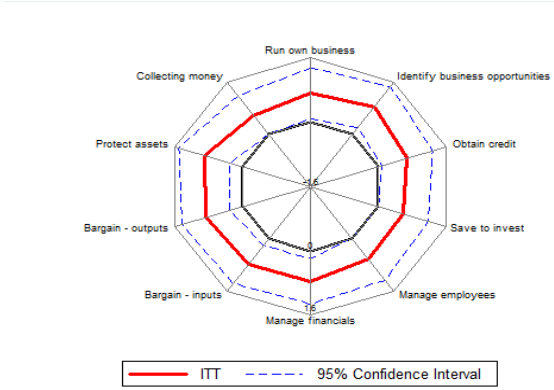
Notes: Unemployment is defined as those who actively wanted a job but did not participate in any employment activities, inclusively self-employment and agricultural works).

Figure 2C: Age-Specific Fertility Rate, 1995-2010



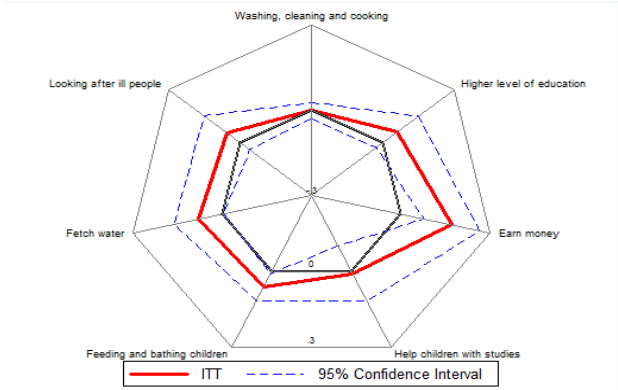
Notes: The data stems from the 2010 UN World Population Prospects data base. The fertility rate is measured by the number of births per 1,000 women. More developed regions comprise Europe, Northern America, Australia/New Zealand and Japan.

Figure 3A: The Impact (ITT) of the ELA Programme on Entrepreneurship Measures



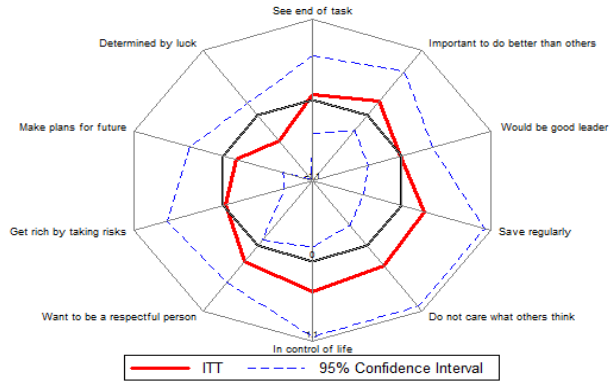
Notes: The adolescents were asked to rank their ability on how well they can do the following activities on a scale of 1 to 10, 1 means they cannot do this activity and 10 is they definitely can (clockwise, begining with the spoke on top): "Run your own business", "Identify business opportunities to start up new business", "Obtain credit to start up new business or expand existing business", "Save in order to invest in future business opportunities", "Make sure that your employees get the work done properly", "Manage financial accounts", "Bargain to obtain cheap prices when you are buying anything for business (inputs)", "Bargain to obtain high prices when you are selling anything for business (outputs)", and "Protect your business assets from harm by othersCollecting the money someone owes you".

Figure 3B: The Impact (ITT) of the ELA Programme on Gender Empowerment Measures



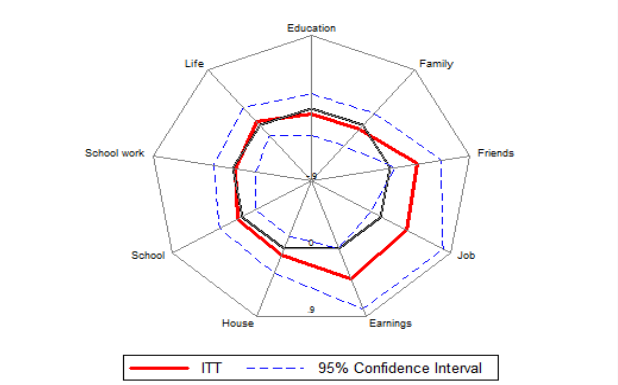
Notes: The adolescents were asked to indicate whether the following taks should be performed by the "Male", "Female" or "Both/Same": "Who should earn money for the family?", "Who should have a higher level of education in the family?", "Who should be responsible for washing, cleaning and cooking?", "If there is no water pump or tap, who should fetch water?", "Who should be responsible for feeding and bathing children?", "Who should help the children in their studies at home?" and "Who should be responsible for looking after the ill persons?". The outcome variable equals 1 if the adolescent indicated that the respective task should be performed by"Both/Same" and 0 otherwise.

Figure 3C: The Impact (ITT) of the ELA Programme on Attitude Measures



Notes: The adolescents were asked to rate how much they think that the following statements are true or false for them. On a scale of 1-10, where 1 is "not at all" and 10 is "a lot" (clockwise, begining with the spoke on top): "If I start working on a task, I definitely see the end of it no matter how difficult it is", "While doing any task, it is important for me to do it better than others", "If I have the chance, I would make a good leader", "I save regularly", "I do not care what others think about my success or failure", "I am in control of what happens in my life", "I want to be a respectful person in my village", "A person can get rich by taking risks", "I often make plans for the future", and "I believe that my future is determined by luck no matter how hard I work."

Figure 3D: The Impact (ITT) of the ELA Programme on Satisfaction Measures



Notes: The adolescents were asked to indicate their satisfaction on a 7 point scale, where 1 is completely happy and 7 is not at all happy. For this exposition, the ranking has been reversed. Clockwise, begining with the spoke at the top, the satisfaction domains are: "Your education level", "Your family", "Your friends", "Your job", "Your earnings / income", "The house you live in", "(If currently studying) The school you go to", "(If currently studying) Your school work", and "Life as a whole".