Empowering the disabled through savings groups: Experimental evidence from Uganda

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Abstract

We report from the first randomized controlled trial of a development program targeting people with disabilities: a village savings- and loans program in rural Uganda. We find that it has had a strong, positive impact on the lives of the disabled participants, through providing access to financial services and strengthening locus of control. Our results suggest that such programs may represent a promising tool to empowering people living with disabilities in developing countries, but also that more comprehensive measures may be needed to overcome taste-based discrimination against disabled individuals.

1. Introduction

There are around a billion people in the world with some kind of disability and they generally have poorer health, lower educational achievements, fewer economic opportunities and higher rates of poverty than people without disabilities. The World Report on Disability (2011) argues that (page xi) "we must empower people living with disabilities and remove the barriers which prevent them from participating in their communities", and points to access to finance as one such barrier. While microfinance programs in principle are open to all, few people with disabilities benefit from such schemes, and the report concludes that more research is needed to understand which measures improve labor market opportunities for people with disabilities, and at the same time are cost-effective and sustainable.

In this paper, we analyze the impact of a village savings- and loans program (VSLA) aimed at empowering people with disabilities in rural Uganda. The program, called We Can Manage!, is run by the National Union of Disabled Persons of Uganda

(NUDIPU) and is supported by The Norwegian Association of Disabled (NAD). The program organizes members into groups of 30, the majority of whom are disabled, while the non-disabled members are either accompanying the disabled or "well-wishers", that is, individuals willing to work closely with disabled people. Members meet on a weekly basis, pool their savings, lend to each other based on demand, ability to repay, and need, and contribute to an emergency fund. NUDIPU helps organize the groups and provides training during the first year on how to manage the group, savings, and loans, but does not provide any direct financial assistance. The savings-and loans cycle is typically one year, after which there is a "share-out", when all savings and interest payments are divided and paid out to the members. The group then decides on whether to start a new cycle or not.

An attractive feature of this program is that it relies on local resources. In particular, the group itself manages the program and there are no cash transfers from outside, which makes it both cost-effective and sustainable. The key question is whether such a low-scale program can have an impact on the lives of people facing the high-scale challenges of disabled persons in a rural, developing country context. In Uganda, these challenges are reflected in the fact that, according to official statistics, the disabled account for a full 25 percent of the population below the $1.25 a day poverty line, compared to seven percent of the population as a whole (Government of Uganda, 2008).

Our study took place in Manafwa, a rural district in East Uganda bordering Kenya. It is relatively poor and with limited access to physical and financial infrastructure (Uganda Bureau of Statistics, 2017). Only seven percent of the district's 350 000 inhabitants have access to piped water, and five percent have access to electricity. Illiteracy is high, standing at 34 percent of the population above 18 years. Only 11 percent of the households have access to a bank account and only five percent own a television.[1]

NUDIPU had plans to expand the We Can Manage program into this district and agreed to collaborate with the research team to adopt a randomized controlled design in the implementation of the program. We conducted a baseline survey during the summer of 2013, where we interviewed 1908 participants from 75 groups, which were formed according to the criteria of NUDIPU, but which were yet to be initiated through training and technical assistance. After the baseline, these groups were randomly assigned into treatment and control groups, where we used a staggered randomized controlled design. The treatment groups were initiated during late 2013/early 2014, while the control groups were initiated after the final data collection in 2016.

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[1] The numbers are from the 2014 population and housing census (www.ubos.org).

Our main finding is that the intervention has had a significant positive impact on the lives of the disabled participants. Compared to the control group, the disabled members of the program report having stronger income growth, increased consumption, and higher levels of general wellbeing and happiness, with improvements being more marked for male than for female participants. We also provide evidence suggesting that the main mechanisms driving these positive changes are higher levels of savings and investment in agricultural land, as well as a strengthening of locus of control. We do not find any impact of the program on other non-cognitive skills, such as willingness to compete, risk-taking, level of trust, or on cognitive skills. Similarly, we find no evidence of the intervention increasing the social capital of the disabled, measured as attitudes to disability among villagers living in the vicinity of the meeting places of the savings groups, even though we do find that the program has raised awareness about NUDIPU in the local population.

To the best of our knowledge, this is the first randomized control trial of a development intervention targeting people with disabilities. It enriches the literature on microfinance by investigating whether informal savings groups can empower highly marginalized groups, and by considering a broad set of outcome variables, including happiness, non-cognitive skills, and societal attitudes. Related contributions studying VSLAs, although not with a focus on disability, include Ksoll et al (2016) who find that a program in Malawi has increased saving and the use of fertilizer and improved seed varieties, and raised agricultural productivity. Karlan et al (2017) evaluate such programs in Uganda, Malawi and Ghana and find some evidence of increased business investment and improvements in food security, but no change in assets two years into the program. Beaman, Karlan, Thuysbaert (2014) consider a VSLA targeting women in Mali, and find that it has improved food security, consumption stability, and buffer stock savings, but find no evidence of any impact on health, education, social capital, or female decision-making power. Finally, Annan et al (2014) analyze the impact of a combined VSLA and business-training program in Burundi, focusing on children's health, and find that it has led to a strong increase in food expenditures, household assets and livestock. In sum, therefore, there is evidence that VSLAs have a positive impact on savings and consumption smoothing for non-disabled people, but more mixed evidence on investment and income generation and almost no evidence on how these interventions affect other important outcome dimensions.

Our paper also relates to the broader literature on how to promote savings in developing countries, individually or in groups. For instance, Dupas and Robinson (2013) demonstrate that providing people with a safe and designated place to save (such as a piggy bank, or a savings club) increased savings and helped people cope with health shocks. Ashraf, Karlan, Yin (2006) show that a sizeable share of the participants in their experiments voluntarily chose to tie their hands by taking up a

commitment savings product, indicating that hyperbolic preferences are an important obstacle to saving for many. Anderson and Baland (2002) point to the social constraints of saving, and find that an important purpose of rotating savings- and loans associations (ROSCAS) is to protect savings from spouses and other family members.

Our main contribution to these literatures is that we study the impact of a savings- and loans program on a particularly vulnerable group, which so far has received very little attention in the literature, namely the disabled. It is not obvious that the lessons from the existing literature generalize to disabled individuals. To illustrate, effects may be stronger for disabled individuals if savings groups represent the only way for them to access financial services, or weaker, if human capital and social capital constraints limit their ability to benefit from such financial innovations. We provide the first set of evidence showing that the effect of such a program is particularly strong for disabled individuals, which suggests that these programs may constitute an important component in development strategies targeting marginalized groups.

In the following, we present the sample and the randomization procedure. Section 3 provides an analytical framework and describes the data and the empirical strategy. Section 4 presents the main results, Section 5 investigates mechanisms, Section 6 heterogeneity effects, Section 7 impact on attitudes towards disabled people in the local community, and Section 8 concludes.

2. Sample and randomization

2.1 The surveys and samples

The baseline survey was conducted during the summer of 2013 before the groups had been assigned treatment or control status. A total of 75 groups had been formed with 30 members in each group, implying a total sample of 2250. Due to absence on the day of the interviews, the baseline survey consists of 1908 participants. Subsequently, during late 2013 and early 2014, treatment groups were given training and technical assistance by NUDIPU, while control groups were initiated after the data collection of the project was completed in 2016.

The baseline survey contained sections on household members, household assets, consumption, income, savings balance and attitudes to saving, happiness, locus of control, math skills, entrepreneurial mindset dimensions, and experiences with discrimination among the disabled. The follow-up study took place during July and August 2016. It had a lower rate of absence than in the baseline and, in total,

included 2075 participants. In the follow-up survey, we asked questions on the same dimensions as in the baseline. [2]

Our main focus is on the respondents that we reached at both baseline and follow-up. Attrition is very low and balanced across treatment arms: we managed to obtain follow-up information from 1800 of the 1908 participants interviewed at baseline (94.5%), with attrition for the treatment group at 5.4 percent and the control group at 5.9 percent (p=0.6).

There are 58 cases where we received information in the follow-up that the person interviewed at baseline was deceased. This implies that we have 1742 observations at the end line with follow-up information; we call this *the main sample*. We also report results for *all* those interviewed in the follow-up survey (N = 2075), but then with a more limited set of control variables. As we show in Appendix A, the main results are robust to the choice of sample. In the analysis, we also consider separately the effect for the disabled participants. See Table 1 for an overview of the different samples used in the analysis.

Table 1. Overview of samples – participants in the program

Description	Name	Observations
Interviewed at end line	Full sample	2075
Disabled interviewed at end line	Disability full sample	1298
Interviewed at both baseline and end line	Main sample	1742
Interviewed at both baseline and end line	Disability main sample	1120

Moreover, in the follow-up, we carried out a survey among people living in the vicinity of the meeting places of the savings groups (and the natural meeting place of the control groups), in order to gauge the impact of the program on attitudes to disability among non-members. We targeted six to ten villagers for each group, treatment and control, and managed to survey 675 heads of households, based on presence at the time of the visit: 310 living nearby the meeting places of the treated groups (treated villagers) and 365 living nearby the natural meeting places of the control groups (control villagers). We refer to this as the "village sample".

2.2 Randomization procedure and balance

Randomization took place after the baseline survey. In order to minimize possible spillovers between treatment and control groups, we identified 63 unique "locations", where a location could consist of more than one group in case a village supplied members to multiple groups. We then randomly allocated the locations to treatment (31 locations, composed of 36 groups) and control (32 locations, composed of 39

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[2]The interviews were carried out by research assistants who were fluent in the local language. The complete surveys are provided in Appendix B.

groups), where the latter groups were informed by NUDIPU that they would be initiated at a later stage.

Table 2. Treatment – control balance, main sample (N = 1742) and disability main sample (N = 1120)

	Main sample			Disability main sample		
	Treatment	**Control**	**Difference**	**Treatment**	**Control**	**Difference**
Disability	0.65	0.66	-0.01			
	(0.48)	(0.47)	(0.02)			
Female	0.53	0.50	0.03	0.53	0.50	0.03
	(0.50)	(0.50)	(0.02)	(0.50)	(0.50)	(0.02)
Age	44.87	45.36	-0.49	47.37	46.83	0.53
	(17.10)	(17.02)	(0.78)	(18.29)	(18.16)	(1.09)
Married	0.69	0.68	0.01	0.61	0.63	0.02
	(0.46)	(0.47)	(0.02)	(0.49)	(0.48)	(0.03)
Wealth index	0.55	0.52	0.03***	0.53	0.51	0.02
	(0.18)	(0.19)	(0.01)	(0.18)	(0.19)	(0.01)
Savings	0.47	0.42	0.05**	0.43	0.39	0.04
	(0.50)	(0.49)	(0.02)	(0.50)	(0.49)	(0.03)
Happy	5.77	5.58	0.19	5.64	5.53	0.12
	(2.31)	(2.34)	(0.11)	(2.39)	(2.34)	(0.14)
Locus of control	2.98	2.96	0.02	2.90	2.88	0.02
	(0.79)	(0.79)	(0.04)	(0.81)	(0.83)	(0.05)
Knowledge	2.28	2.31	0.03	2.17	2.24	-0.07
	(1.32)	(1.31)	(0.06)	(1.37)	(1.36)	(0.08)

Note: The table shows average values for participants in treatment and control groups at baseline. *Disability* takes the value 1 if the participant is disabled, and zero otherwise. *Female* takes the value 1 if the respondent is female, and zero if male. *Age* is the respondent's age (in years); *Married* takes the value one if the respondent is married, and zero otherwise; *Wealth index* is an index based on condition of house, ownership of animals and agricultural equipment, clothing and shoes, number of meals per day; *Savings* takes the value one if the respondent has savings, and zero otherwise; *Happy* (1-10) is the reply to the question: "Overall, how happy were you with your life as a whole these days?" ; *Locus of control* is the average score based on four questions in the baseline (i) "You can always manage to solve difficult problems if you try hard enough"; (ii) "It is easy for you to stick to your aims and accomplish your goals"; (iii) "You are confident that you could deal efficiently with unexpected events"; (iv) "When you are in trouble, you can usually think of a solution", where there are four alternatives for each question, ranging from 1 (not at all true) to 4 (exactly true); *Knowledge* is an index based on three math questions and an indicator for literacy; Standard deviations in parentheses, except for *Difference*, which shows standard errors clustered on location in parenthesis, with *** = p <0.01; ** = p < 0.05; * = p<0.1.

Table 2 shows the treatment-control balance on covariates specified in the pre-analysis plan as well as key outcome variables, for both the main sample and the disability main sample.[3] See Appendix A for treatment-control balance for the full sample (Table A1), where we only include the variables from Table 2 that cannot be

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changed by treatment, that is, disability status, gender, and age. We observe that the randomization ensured a balance between treatment and control group on all observables in the group of disabled participants, as well as for the main sample, except for wealth and savings. We deal with the imbalances in these two baseline variables by controlling for them in the regressions.

We observe from Table 2 that around two thirds of the participants are disabled, around half are female, and the average age is 45 years. Illiteracy (which is part of the knowledge index) is at 50 percent. The majority of participants are married. Additional data (not reported in the table) show that the majority of the participants have not finished primary school, and that 49 percent report agriculture as main source of income, 20 percent employment, 17 percent business, and 10 percent support from spouse or family.

2.3 The disabled: a marginalized group

Out of the 1120 disabled participants at baseline, 742 reported some difficulty in using their limbs and other body parts to perform routine tasks; 349 reported some difficulty in seeing; and 181 some difficulty in hearing. Table 3 compares disabled and non-disabled members on key dimensions from baseline, and refers to Table A2 for the corresponding table for the full sample.

Table 3. Disabled and non-disabled, main sample (N = 1742)

	Disabled	**Non-disabled**	**Difference**
Female	0.45	0.64	-0.19***
	(0.50)	(0.48)	(0.02)
Age	47.09	41.79	5.30***
	(18.21)	(12.97)	(0.83)
Married	0.62	0.80	-0.18***
	(0.49)	(0.40)	(0.02)
Wealth index	0.52	0.55	-0.03***
	(0.18)	(0.19)	(0.01)
Savings	0.41	0.48	-0.06***
	(0.49)	(0.50)	(0.02)
Happy	5.60	5.72	-0.12
	(2.37)	(2.25)	(0.11)
Locus of control	2.91	3.05	-0.14***
	(0.80)	(0.76)	(0.04)
Knowledge	2.25	2.37	-0.11*
	(1.35)	(1.27)	(0.08)

Note: The table shows average values for disabled and non-disabled participants at baseline. Variables are defined in Table 2. Standard deviations in parentheses, except for *Difference*, which shows standard errors clustered on location in parenthesis, with *** = p <0.01; ** = p < 0.05; * = p<0.1.

We observe that we have a larger share of males among the disabled than among the non-disabled. The disabled are also older than the non-disabled and less likely to be married. In terms of financial capital, we observe that the disabled have significantly lower wealth and savings than the non-disabled. As for human capital, they score significantly lower on both non-cognitive skills (*Locus of control)* and cognitive skills (*Knowledge*). We do not observe a statistically significant difference between the disabled and the non-disabled on the self-reported level of happiness.[4]

We do not have a measure of social capital that allows comparison with the non-disabled, but the disabled extensively reported at the baseline to be socially isolated and discriminated against due to their disability: 55 percent agreed (moderately or strongly) to the statement: "You feel socially isolated because of your disability"; 70 percent agreed that "You sometimes experience disrespect and abuse because of your disability"; 45 percent that "People pay you less for work you do just because of your disability"; and 63 percent agreed with the statement "People do not think you can do good work because of your disability". It therefore appears likely that the disabled have less social capital than the non-disabled participants.

3. Analytical framework and empirical strategy

We here present a simple analytical framework to structure our thinking about mechanisms linking the intervention to key outcome variables, and then present the empirical strategy.

3.1 Analytical framework

We expect the savings program to affect three main outcomes: income (Y), consumption (C) and welfare (W). In terms of mechanisms, we hypothesize that the impact of the program could work through three channels: accumulation of (i) financial and physical capital (K); (ii) human capital, including non-cognitive skills, (H), and (iii) social capital (D). Since the intervention takes the form of a savings program, we expect the main mechanism to run through changes in K, by own savings and access to loans from the group funds. Savings may increase both through behavioral mechanisms (such as reduced procrastination and increased attention; Ashraf, Karlan, Yin, 2006) and by providing access to a safe place to save (the savings boxes controlled by the group leaders; Dupas and Robinson, 2013). However, the program can also plausibly affect human capital, as it provides an arena for the sharing of information and ideas, as well as for developing non-cognitive skills like

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[4] The absence of a statistically significant difference on happiness could potentially be due to disabled and non-disabled individuals having different reference groups in mind when evaluating their happiness, see for instance Luttmer (2004) and Blanchflower and Oswald (2004). But it may also reflect that the disabled take pride in their disability, see Bjorvatn and Tungodden (2015).

confidence (recall that the name of the program is We Can Manage!), forward looking behavior and discipline (at the group meetings, high savings are typically applauded, while late-coming is fined). Indeed, non-cognitive skills have been found to be important predictors of socio-economic outcomes (Heckman and Kautz, 2012), including the development of small-scale businesses in an African context (Berge et al., 2015b; Campos et al., 2017).

Finally, the program may improve the main outcomes, income consumption, and welfare, by strengthening the group members' social capital, by the way of building business networks and, for the disabled participants, reducing stereotypes, which may have prevented them from being fully integrated in the local community. This is in line with the literature suggesting that interaction between groups in society reduces prejudice and promotes inter-group cooperation (Rao, 2015; Boisjoly et al., 2007, Burns et al., 2013).

To formalize this framework, assume that income is generated through a production function $Y = f(K, H, D)$, that consumption is a function of income, $C = c(Y)$, and that welfare in addition to income, is also directly affected by human capital and social capital, $W = w(Y, H, D)$. We assume that the normal properties apply, such that the marginal product of each factor of production is positive but decreasing, and that the marginal product increases in the level of the complementary inputs. The effect of the program thus depends on both its effect on K, H and D, and on the initial levels of these factors, K_0, H_0 and D_0. Given these assumptions, we can formulate the following two hypotheses:

Hypothesis 1 (Complementarity). The impact of an increase in financial and physical capital (K) on the main outcomes (Y, C, W) increases with the initial level of the complementary factors (H_0, D_0). Similarly, for any given level of H_0 and D_0, the impact of a given increase in K is larger, the lower the initial level, K_0.

Hypothesis 2 (Comprehensiveness). The impact of the program on the main outcomes (Y, C, W) is larger when it leads not only to an increase in financial and physical capital, but also to an increase in the other factors of production; human capital (H) and social capital (D).

The analytical framework thus highlights the importance of initial conditions and comprehensiveness of the program in determining the impact of the intervention, in particular for the welfare dimension where human and social capital enter both directly and indirectly (through the generation of income). Given the observed differences in initial conditions between disabled and non-disabled, as described in Table 3, it is plausible that the treatment effects of the intervention will differ between

these two groups. Note, however, that it is not a priori clear whether the treatment effect will be stronger or weaker for the disabled compared to the non-disabled. Referring to Hypothesis 1, on the one hand, if the program leads to increased savings and investment in physical capital, this per se should have a larger impact on income of the disabled, given their lower initial level of financial capital. On the other hand, the marginal effect of savings also depends on the level of complementary inputs, notably human and social capital, on which the disabled typically score lower, and, hence, this suggests that the impact will be lower. Referring to Hypothesis 2 regarding the comprehensiveness of impact, it is plausible that the intervention to a larger extent also affects human and social capital of the disabled, since they are more likely to be excluded from other sources of information and networking.

3.2 Empirical strategy
In our main analysis, we estimate the intention to treat estimators (ITT) for each outcome Y_i using ordinary least squares (OLS) and clustering on location (63 clusters). For each outcome, we have calculated z-scores in order to make the effects more comparable across dimensions. In the analysis, we report outcomes for the main sample based on the following two empirical models:

$$Y_i = \alpha + \beta_1 Treated + \beta_2 Controls + \varepsilon_i, \tag{1}$$

$$Y_i = \alpha + \beta_1 Treated + \beta_2 Treated * Able + \beta_3 Able + \beta_4 Controls + \varepsilon_i, \tag{2}$$

where Yi is a main outcome variable, *Treated* is an indicator of treatment status, *Controls* is a vector of control variables from baseline, *Able* takes the value one if the participant is non-disabled, and zero if disabled. In model (1) we estimate the overall effect of the treatment, while (2) allows us to estimate treatment effects on the disabled and non-disabled separately. The treatment effect on the disabled in this case is given by the estimated coefficient on *Treated*, while the treatment effect on the non-disabled is given by *Treated + Treated*Able*. In Appendix A, we show the results based on the full sample.

We analyze heterogeneity in treatment effects according to gender among the disabled by running the regression:

$$Y_i = \alpha + \beta_1 Treated + \beta_2 Treated * Female + \beta_3 Female + \beta_4 Controls + \varepsilon_i \tag{3}$$

The focus on gender is relevant in light of the literature on financial and human capital interventions to promote small-scale business development, which shows that it may be particularly challenging to develop the businesses of female entrepreneurs (see for instance de Mel et al., 2008, and Berge et al., 2015a). In the appendix, we also

report heterogeneity according to initial wealth, as specified in our pre-analysis plan. Finally, we use the framework in (1) – (3) to study the impact of the intervention on underlying mechanisms, where *Yi* in these regressions refers to measures of financial capital, human capital, and social capital.

4. Results: Main outcomes

4.1. Treatment effects on main outcomes

We construct three indexes based on average z-scores: *Income*, based on *Income change* and *Income contribution*; *Consumption,* based on *Clothes*, *Meals* and *Meat;* and *Welfare,* based on *Happy* and *Change in wellbeing.* These three indexes form the main outcomes of interest in our study, as specified in our pre-analysis plan. Table A3 provides the definitions and descriptive statistics of the key outcome variables.

Table 4 documents the impact of the program on the main outcomes. We report both average treatment effects for all participants as well as for the disabled and non-disabled separately by the use of interaction effects. See Table A4 for results based on the full sample.

The main finding is that the intervention has had a strong positive impact on the lives of the disabled participants, with effects on income and welfare significant at the one percent level, and effects on consumption at the five percent level. The effects are also economically significant, at around 0.2 standard deviations. Moreover, we observe that the interaction effect between the treated and the non-disabled is negative in all regressions, although not statistically significant. Still, the pattern that the treatment has had a stronger impact on the disabled is systematic: the coefficients for the non-disabled are around half the size of those for the disabled and for none of the dimensions significantly different from zero. We can summarize these findings with the following observations:

Observation 1. *There are large and precisely estimated positive treatment effects of the program for the disabled on all three main outcomes: income, consumption and welfare.*

Observation 2. *The treatment effects on the main outcomes are overall larger for the disabled participants than for the non-disabled participants.*

The finding that the treatment effect is larger for the disabled group could be due to the disabled having a more disadvantaged starting point, in line with Hypothesis 1, or due to a more comprehensive effect of the program for the disabled group, in line with Hypothesis 2. We return to a more detailed discussion of this issue when we explore possible mechanisms driving the treatment effects in Section 5.

Looking at the covariates, we note that the non-disabled score higher on all three dimensions (although not significantly so on consumption), which is in accordance with what we would expect. We further observe that females are economically less empowered than males: they have lower levels of income, and consumption. The other background characteristics are also significantly associated with the outcome variables, and with the expected signs.

Table 4. Main outcomes: Income, consumption and welfare, main sample (N = 1742).

	Income	Income	Consumption	Consumption	Welfare	Welfare
	1	2	5	6	3	4
Treated	0.175***	0.219***	0.105*	0.126**	0.141***	0.165***
	(0.05)	(0.06)	(0.06)	(0.06)	(0.05)	(0.06)
Non-disabled	0.040	0.098*	-0.034	-0.072	0.089*	0.121**
	(0.05)	(0.05)	(0.04)	(0.05)	(0.04)	(0.06)
Treated* Non-disabled		-0.124 (0.10)		-0.058 (0.07)		-0.068 (0.09)
Female	-0.133***	-0.132***	-0.180***	-0.180***	-0.086*	-0.085*
	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
Age	-0.066	-0.069	-0.131***	-0.132***	-0.190***	-0.192***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Married	0.154***	0.157**	0.029	0.030	0.102*	0.104*
	(0.05)	(0.05)	(0.04)	(0.04)	(0.06)	(0.06)
Wealth	0.118***	0.120***	0.156***	0.158***	0.079*	0.080*
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Saving	0.111**	0.111**	0.167***	0.168***	0.092*	0.090*
	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
Knowledge	0.089***	0.089***	0.037**	0.037**	0.081***	0.081***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Locus of control	0.045	0.045	0.060**	0.060**	0.046	0.046
	(0.03)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)
Constant	-0.534***	-0.556***	-0.313***	-0.324***	-0.426***	-0.438***
	(0.11)	(0.11)	(0.08)	(0.08)	(0.10)	(0.10)
Treated + Treated* Non-disabled		0.095 (0.08)		0.068 (0.08)		0.097 (0.08)
Observations	1742	1742	1742	1742	1742	1742

Note: The table reports ITT regressions where the outcome variable is regressed on treatment status and the interaction between treatment status and a dummy for being non-disabled Treated*Able. The outcome variables are (i) Income, (ii) Welfare, and (iii) Consumption, as described in Table A3, while the covariates are described in Table 2. Cluster-robust standard errors (clustered on location) in parenthesis; * = p<0.1; ** = p < 0.05; *** = p <0.01.

Consistent with the evidence presented in Table 4 (but not reported there), we find a positive treatment effect for the disabled (and overall) on income stability, based on

the question "How would you describe the stability of your income during the last 12 months?" (measured on a scale from 1-3, where 1 = Worse and 3 = Better), and on how they see their life relative to others in the village, based on the question "How is your life compared to other people in your village?" (measured on a scale from 1-5, where 1 = Much worse, 5 = Much better). On income stability the impact for the disabled amounts to a 0.15 standard deviation improvement (p=0.02), while on life compared to the other villagers the impact is 0.18 standard deviation (p=0.00).

5. Mechanisms: Financial, physical, and human capital

In this section, we study the mechanisms that may explain the observed treatment effects. Given the nature of the program, we hypothesize that improvements in the main outcomes primarily come through improved access to financial capital. However, we also study whether the program has caused changes in human and social capital, which in turn may improve the main outcomes, in line with Hypothesis 2 in the theoretical framework.

Table A5 provides the definition and descriptive statistics of the variables used in the analysis of changes in financial capital (savings, ownership of agricultural land and animals) and human capital (locus of control, willingness to compete, risk, and trust). We turn to an analysis of effects on social capital in the next section.

We observe from Table 5 that for the disabled the intervention has mainly worked through an increase in savings and investment, where the investment is concentrated in agricultural land. The treatment effects on savings and land ownership are economically significant and of the same size as for the main outcomes, at around 0.15 standard deviation. In fact, the average savings balance is 2.75 times higher for the treated group than for the control group, at 237 000 Ush (95 USD) compared to 86 000 Ush (34 USD). We do not find any treatment effect on the ownership of animals.

For the human capital dimensions, we find a marginally insignificant effect on locus of control of 0.13 standard deviation, where the treated disabled participants feel more in control of their life than the disabled in the control group (p = 0.106). We do not find any statistically significant effects of the program on the other non-cognitive skills or on cognitive skills. However, we do find an impact in attitudes to saving among the disabled participants: while 71 percent in the control group report that they do not have enough money to save, the corresponding number for the treatment group is 61 percent (p=0.00). Similarly, 29 percent in the control group state that it is too risky to save, compared to 23 percent in the treatment group (p=0.02). These findings, while not specified in the pre-analysis plan, suggest that the program has led to a change in attitudes to saving, which may contribute to explain the observed treatment effect on savings.

Table 5. Financial capital, physical capital, and human capital, main sample (N = 1742)

	Financial and physical capital			Human capital			
	Saving	Agricultural land	Animals	Locus of control	Compete	Risk	Trust
	1	2	3	4	5	6	7
Treated	0.155***	0.168**	-0.081	0.127	-0.051	0.014	0.051
	(0.07)	(0.07)	(0.06)	(0.08)	(0.06)	(0.08)	(0.08)
Non-disabled	-0.013	0.166**	-0.074	0.165***	-0.027	0.141*	-0.051
	(0.02)	(0.07)	(0.06)	(0.05)	(0.05)	(0.08)	(0.07)
Treated*	-0.021	-0.070	0.023	-0.134	0.055	-0.106	0.058
Non-disabled	(0.11)	(0.08)	(0.10)	(0.10)	(0.09)	(0.11)	(0.10)
							-
Female	-0.105***	-0.121**	-0.065	-0.227***	0.055	-0.001	0.112**
	(0.04)	(0.05)	(0.04)	(0.05)	(0.05)	(0.06)	(0.05)
Age	-0.014	0.107*	-0.066	-0.068	-0.151***	-0.097*	0.041
	(0.04)	(0.06)	(0.04)	(0.05)	(0.05)	(0.05)	(0.04)
Married	0.046*	0.263***	0.179***	0.186***	0.060	0.051	0.055
	(0.03)	(0.07)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
Wealth	0.101**	0.087	0.350***	-0.046	-0.025	-0.050	-0.043
	(0.04)	(0.06)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)
Saving	0.049	0.103**	0.040	0.092*	0.060	0.099*	-0.017
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Knowledge	0.035**	0.008	0.022	0.095***	0.094***	-0.016	-0.017
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Locus of control	0.033	0.059*	0.050*	0.075*	0.074**	-0.006	0.056*
	(0.02)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)
Constant	-0.286**	-0.577***	-0.480***	-0.498***	-0.325***	0.003	-0.110
	(0.09)	(0.12)	(0.11)	(0.14)	(0.11)	(0.12)	(0.10)
Treated+	0.133*	0.098	-0.059	-0.007	0.004	-0.092	0.110
Treated*	(0.07)	(0.07)	(0.11)	(0.11)	(0.08)	(0.11)	(0.09)
Non-disabled							
Observations	1742	1742	1742	1742	1742	1742	1742

Note: The table reports ITT regressions where the outcome variable is regressed on treatment status and a series of covariates, as defined in Table 2, while the outcome variables are defined in Table A5. Cluster-robust standard errors in parenthesis; * = p<0.1; ** = p < 0.05; *** = p <0.01.

We also observe a tendency that the impact on agricultural land and locus of control has been stronger for the disabled than for the non-disabled, as shown by the sizeable, although statistically insignificant, interaction variables in Table 5. Indeed, only on savings do we find a significant treatment effect on the non-disabled.

We can summarize the main findings from Table 5 as follows:

Observation 3. *The main mechanism of the program has been to strengthen savings and investments among the disabled participants, but there is also suggestive evidence of a strengthening of their locus of control.*

Observation 4. *There is suggestive evidence that the treatment effect on agricultural land and locus of control has been stronger for the disabled than for the non-disabled participants.*

Observation 4 provides evidence of the treatment initiating stronger changes in the financial and human capital dimensions for the disabled participants. Taking this together with the fact that the disabled scored lower on both these dimensions at baseline, it follows from the theoretical framework that the treatment effects on the main outcome variables should be stronger for the disabled individuals, as established in Observation 2.

On the covariates of Table 5, we again find that females score lower than males on most dimensions, confirming that they are more marginalized than males. The lower level of human capital of females is also reflected in the fact that the literacy rate is 32 percent for disabled females compared to 45 percent for disabled males, measured at baseline.

6. Heterogeneity analysis by gender
Our data clearly show that females are less empowered than males, both in terms of human capital and in terms of welfare. The theoretical model predicts that a more disadvantaged starting point should imply a larger return to changes in any specific input, but also that a lower endowment of complementary inputs works in the opposite direction. Hence, theoretically, females may well respond differently to the policy intervention than males, but it is not clear whether one should expect a stronger or weaker response.[5]

We carried out this analysis on all three main outcomes as well as on the three mechanisms where we found a treatment effect, namely saving, agricultural land, and

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[5] A similar heterogeneity analysis on baseline wealth shows no significant interaction effects, see Table A6.

locus of control. In this part, we focus on the main disability sample. See the appendix for results also for the other mechanism variables, as well as for the main sample and the full sample. Table 6 summarizes the results. For males, the treatment effect is positive and strong for all main outcomes, as well as for the three mechanism variables.

Table 6. Heterogeneity by gender, disability main sample (N = 1120)

	Income	Consumption	Welfare	Saving	Agricultural land	Locus of control
	1	2	3	4	5	6
Treated	0.305***	0.205***	0.238***	0.268**	0.178*	0.258***
	(0.08)	(0.06)	(0.08)	(0.13)	(0.09)	(0.09)
Treated*Female	-0.180*	-0.165*	-0.155	-0.247*	-0.017	-0.281**
	(0.10)	(0.09)	(0.12)	(0.14)	(0.14)	(0.11)
Female	-0.070	-0.085	-0.020	-0.018	-0.181*	-0.110
	(0.07)	(0.06)	(0.08)	(0.03)	(0.10)	(0.09)
Constant	-0.656***	-0.386***	-0.515***	-0.290***	-0.606***	-0.624***
	(0.12)	(0.08)	(0.13)	(0.12)	(0.16)	(0.15)
Treated +	0.126	0.039	0.082	0.020	0.161	-0.023
Treated*Female	(0.08)	(0.08)	(0.09)	(0.02)	(0.11)	(0.10)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1120	1120	1120	1120	1120	1120

*Note: The table reports ITT regressions where the outcome variable is regressed on treatment status and the interaction between treatment status and a dummy for being female (Treated*Female). The outcome variables and covariates are described in Table 5, and the covariates are the same as in that table. Cluster-robust standard errors (clustered on location) in parenthesis; * = p<0.1; ** = p < 0.05; *** = p <0.01.*

In particular, it is interesting to notice that the intervention has also increased significantly the locus of control of the disabled males (p=0.008), which clearly shows that the positive impact of the intervention is partly driven by a strengthening of non-cognitive skills. In contrast, for disabled females, there are no significant treatment effects on any dimension. Indeed, the interaction effect is negative for all outcomes, although not significant for welfare and agricultural land. We can summarize the findings from Table 6 as follows:

Observation 5. *There are large and precisely estimated positive treatment effects of the program for the disabled males on all three main outcomes: income, consumption and welfare, and on the mechanism variables: saving, agricultural land, and locus of control. The treatment effects are not statistically significant for disabled females on the main outcomes or on the mechanism variables.*

Our results thus add to the findings in the literature on the challenges of empowering females, in our study a particularly marginalized group that also faces challenges because of their disability. In line with the theoretical model, we interpret the gender difference in impact as due to the females' lower level of complementary inputs at the baseline, combined with a more comprehensive effect of the program on males both in terms of savings and locus of control. Moreover, in the analysis of social capital that we present in the next section, we document a stronger negative taste-based discrimination of disabled females than of disabled males, which could also contribute to explain the lack of treatment effects of the program on females.

7. Social capital: Attitudes to disabled in the local community

In this section, we study whether the intervention has had any impact on the social capital of the disabled participants, in particular in terms of how they are perceived by other members of their local community. This part of the study is more explorative, as both the sample as well as the amount of data are somewhat limited.

In order to get an impression of whether the intervention has had a positive impact on the attitudes towards disabled persons, we randomly visited households in the vicinity of the meeting places of the groups in the follow-up study: 310 in the vicinity of the treated groups (treated villagers) and 365 in the vicinity of the natural meeting place of the control groups (control villagers). Table 7 shows that treatment and control groups in the village sample are balanced on gender, age, and the share that have farming as their main occupation.
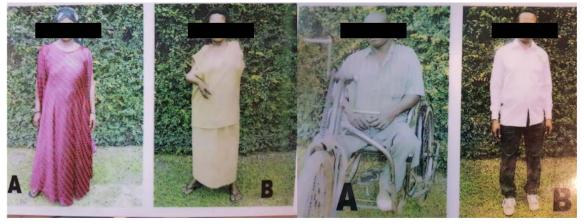
Table 7. Treatment – control balance, village sample (N = 675)

	Treatment	Control	Difference
Female	0.55	0.60	-0.05
	(0.50)	(0.49)	(0.04)
Age	42.8	42.4	0.48
	(16.0)	(15.1)	(1.19)
Farmer	0.76	0.80	-0.04
	(0.43)	(0.40)	(0.03)

Note: *Female* takes the value one if the respondent is female, and zero if male; *Age* is the age of the respondent in years; *Farmer* takes the value one if the respondent's main occupation is farming, and zero otherwise. Standard deviations in parentheses, except for *Difference*, which shows standard errors clustered on location in parenthesis, with *** = p <0.01; ** = p < 0.05; * = p<0.1.

For the village sample, we test experimentally whether there is an impact of the intervention on taste-based discrimination of disabled individuals. The village respondents were presented with posters displaying two individuals, one non-disabled and one disabled. We did this separately with one poster showing two women and one poster showing two men. As shown in Figure 1, Woman B had a clearly visible disability, while man A is seen sitting in a wheelchair. We told the respondents to imagine a situation where they would be invited to a contest where they could earn prize money, and where participation in the contest was based on a random draw of names from a bag. Their task was to choose who they wanted to make the random draw for them, one male and one female. Evidently, picking a name from a bag does not depend on any skill and thus systematically favoring the non-disabled person for this task would identify taste-based discrimination.

Figure 1. Who do you want to make the draw?

Note to figure: The figure displays two posters, which were shown to the participants in the village sample, with the two women on one poster and the two men on the other. As can be seen, woman B and man A are disabled, while there is no visible disability for woman A and man B.

After they had decided who should make the draw, we asked the villagers whether they had heard about the disability organization NUDIPU, and their opinion on a number of statements pertaining to disability. The outcome variables in the village survey, together with definitions and summary statistics, are presented in Table 8.

We observe that only 31 percent of the participants chose the disabled woman for the task of randomly picking a name for them, which is significantly less than the random draw of 50 percent (the 95 percent confidence interval is 0.27-0.34), and hence provides strong evidence of negative discrimination against disabled females. When choosing between the two males, however, the respondents were equally likely to choose A (disabled) and B (non-disabled). This could suggest that discrimination of disability has a gender bias, where disabled females are more likely to be

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associated with bad luck than disabled males.[6] Lack of social capital may thus be a more serious barrier to the empowerment of females than males, and can shed light on the gender bias in treatment effects from the program reported in Section 6.

We also observe that 33 percent of the villagers had heard about the disability organization NUDIPU, and that the average score on the disability index is 0.09, which is significantly different from zero (the 95 percent confidence interval is 0.08-0.10) but small, given the range from zero to one.

Table 8. Summary of outcome variables in village survey

Variable name	Definition	Mean	Min	Max	Std
Choice disabled woman	Choice of woman B (disabled) to pick name from bag	0.31	0	1	0.47
Choice disabled male	Choice of man A (disabled) to pick name from bag	0.53	0	1	0.50
Heard of NUDIPU	Have you heard of NUDIPU?	0.33	0	1	0.47
Discrimination	Index based on responses to seven statements on disability, with options ranging from 1 (Fully disagree) to 5 (Fully agree): (i) Children with disabilities do not need to go to school ; (ii) Persons with disabilities can marry ; (iii) Persons with disabilities are bad luck ; (iv) It is ok to leave a disabled child tied in the house ; (v) Children with disabilities need the same amount of food as other children ; (vi) Children with disabilities should not be allowed to play with other children; (vii) Persons with disabilities cannot do good work given the opportunity. Responses have been rescaled to capture negative attitudes to disabled and with a scale 0-1, where 0 is minimal discrimination and 1 is maximal discrimination.	0.09	0	0.71	1.36

In Table 8, we show the results from a regression analysis of whether the intervention has had an impact on the villagers. Table 9 shows the regression results. Interestingly, we find that the intervention has indeed made the villagers living in the vicinity of the group meetings more aware of NUDIPU (column 4), but, as we can see from columns 1-3, this has not had a significant effect on their views on disabled people: treated villagers are equally likely to prefer the non-disabled person as control villagers, and there is also no significant difference between the two groups in views on disability based on the survey questions. We also investigate heterogeneity in treatment effects based on gender, but with no significant results (see Table A8).

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[6] Bad luck associated with females has been described elsewhere in the literature, see for instance Miguel (2005) on witch killings in Tanzania.

The evidence from the village sample suggests that the negative bias against females with disabilities can shed light on the fact that females have not benefited to the same extent as males in from the program. We can summarize the insights from Table 9 as follows:

Observation 5. *We find evidence of taste-based discrimination against disabled females in the local community, but no impact of the program on the level of taste-based discrimination.*

The presence of taste-based discrimination against females suggests that a low level of social capital may contribute to explain the weaker treatment effects on income, consumption, and welfare for the female disabled.

Table 9. Attitudes to disabled, village sample

	Choice of disabled woman	Choice of disabled man	Discriminate	Heard of NUDIPU
	1	2	3	4
Treated	-0.009	0.012	-0.010	0.113**
	(0.04)	(0.05)	(0.02)	(0.05)
Female	-0.011	-0.008	0.028**	-0.217***
	(0.04)	(0.05)	(0.01)	(0.03)
Age	-0.002**	0.001	-0.00	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Farming	0.001	-0.035	0.02*	-0.061
	(0.04)	(0.04)	(0.01)	(0.04)
Constant	0.406***	0.501***	0.088***	0.485***
	(0.07)	(0.08)	(0.02)	(0.07)
Observations	675	675	675	675

*Note: The table reports ITT regressions where the outcome variable is regressed on treatment status for the village sample, with covariates Female, Age in number of years, and Farming, which takes the value one if farming is the main source of income. Cluster-robust standard errors in parenthesis; * = p<0.1; ** = p < 0.05; *** = p <0.01.*

8. Conclusion

People with disabilities are typically amongst the poorest of the poor, and targeting this group is high on the development policy agenda, as evidenced by the Sustainable Development Goals (sustainabledevelopment.un.org). There is, however, strikingly little research on how to improve the economic and social situation of this highly marginalized group. The current paper aims to initiate a literature that can fill this gap by reporting from the first field experiment evaluating a development intervention targeting people with disabilities.

We find strong evidence of the savings program in Uganda having a positive effect on the income, consumption, and welfare of the disabled group members, with effects being particularly pronounced for the disabled male participants. The gender difference in treatment effects appears to reflect a combination of the fact that females were more marginalized than the males at the baseline in terms of human and social capital, and the fact that the program has had a stronger impact on males than females in terms of financial capital and locus of control.

In a novel experiment with a village sample, we establish that there is significant taste-based discrimination against disabled females, while we do not observe the same behavior towards disabled males. We do not find any evidence of the program reducing taste-based discrimination.

In sum, our study documents that a cost-effective and sustainable program, relying on local resources, can make a big difference in the lives of a highly vulnerable group. However, our study also shows that disabled females face barriers to development that are more severe than those of their male counterparts, and that a savings program alone may not be enough to improve their situation. Potentially, the most effective program to empower the disabled is one that eases their financial constraints and boosts their level of confidence, but also manages to build down prejudices against them in society, prejudices which appear to harm females in particular. Indeed, one promising avenue for future research is to investigate how development interventions can reduce stereotypes against disabled persons and strengthen their social capital. We hope that this paper will inspire more research on how to improve the lives of one of the most marginalized groups in the developing world.

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Appendix A. Additional regressions

Table A1. Treatment – control balance, full sample (N = 2075) and disability full sample (N = 1298)

	Main sample			Disability main sample		
	Treatment	**Control**	**Difference**	**Treatment**	**Control**	**Difference**
Disability	0.27	0.62	-0.00			
	(0.48)	(0.48)	(0.02)			
Female	0.53	0.50	0.03	0.45	0.43	0.03
	(0.50)	(0.50)	(0.02)	(0.50)	(0.50)	(0.03)
Age	46.10	45.57	-0.52	47.91	47.17	0.74
	(16.70)	(16.76)	(0.78)	(18.29)	(18.20)	(1.01)

Note: The table shows average values for participants in treatment and control groups at baseline. Definitions of variables are given in Table 2. Standard deviations in parentheses, except for *Difference*, which shows standard errors clustered on location in parenthesis, with *** = p <0.01; ** = p < 0.05; * = p<0.1.

Table A2. Summary of main outcome variables, main sample

Variable name		Definition	Mean	Min	Max	Std
Income		Index based on average z-scores of Income change and Income contribution	0.013	-1.04	1.83	0.83
	Income change	Think back three years: How is your income in general compared to then? 1=Lower; 2=About the same; 3=Higher	1.89	1	3	0.87
	Income contribution	How would you characterize your income contribution to your household? 1=Very unsatisfactory; 2=Somewhat unsatisfactory; 3=Somewhat satisfactory; 4=Very satisfactory	1.93	1	4	0.87
Consumption		Index based on average z-scores of Meals, Meat, and Clothes	0.00	-1.10	2.55	0.74
	Meals	How many meals did you eat yesterday?	2.23	0	5	0.75
	Meat	During the last year, in a normal week, how many days did you have meat or fish?	0.68	0	7	0.91
	Clothes	During the last 12 months, have you bought new clothes for yourself?	0.50	0	1	0.50
Welfare		Index based on average z-scores of Happy and Change in wellbeing	0.01	-1.87	1.51	0.86
	Happy	Overall, how happy are you with your life as a whole these days? 0=Not at all happy; 10=Completely happy	5.93	0	10	2.32
	Change in wellbeing	Think back three years: How is your wellbeing compared to then? 1=Lower; 2=About the same; 3=Higher	1.98	1	3	0.82

Table A3. Main outcomes, main sample (N = 1742) and full sample (N = 2075)

	1	2	3	4	5	6
	Income Main sample	Income Full sample	Consumption Main sample	Consumption Full sample	Welfare Main sample	Welfare Full sample
Treated	0.216***	0.193***	0.131**	0.133**	0.159**	0.141**
	(0.07)	(0.07)	(0.06)	(0.05)	(0.06)	(0.06)
Non-disabled	0.141**	0.104**	0.015	0.007	0.173***	0.107***
	(0.05)	(0.05)	(0.05)	(0.04)	(0.06)	(0.06)
Treated*	-0.078	-0.027	-0.019	-0.029	-0.015	0.050
Non-disabled	(0.11)	(0.09)	(0.07)	(0.06)	(0.10)	(0.09)
Constant	-0.128***	-0.127***	-0.065	-0.058	-0.127***	-0.124***
	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)
Controls	No	No	No	No	No	No
Observations	1742	2075	1742	2075	1742	2075

*Note: The table reports ITT regressions where the outcome variable is regressed on treatment status and an interaction by treatment and disability. The outcome variables are defined in Table 5. Cluster-robust standard errors in parenthesis; * = p<0.1; ** = p < 0.05; *** = p <0.01.*

Table A4. Summary of key mechanisms variables, main sample

Variable name	Definition	Mean	Min	Max	Std
Saving	What are your current savings balances (at savings groups, at banks, at home, with friends and family, etc)? Measured in Uganda shilling.	157'	0	25''	964'
Agricultural land	Do you have agricultural land? (Yes=1/No=0)	0.89	0	1	0.32
Animals	An index of ownership of farm animals (turkeys, chickens, ducks, etc).	0.42	0	5	0.49
Locus of control	Index based on answer to four questions; see note to Table 2 for definition.	0.80	0.25	1	0.18
Compete	Hypothetical choice to compete in memory game, where they were presented with 10 items, and a payment schedule of either (i) fixed rate of 1000 Ush for each item remembered, or (ii) competition rate of 3000 Ush for each item remembered, but only if they remembered more items than the average in their community, and zero otherwise.	0.58	0	1	0.49
Risk	Hypothetical choice of risky option where the safe option paid 500 Ush in cash and the payment in the risky option was determined by the flip of a coin: 1500 Ush if heads, zero if tails.	0.33	0	10	0.46
Trust	Index based on three questions: How much do you trust (i) your relatives; (ii) other people you know; (iii) other people in your community? The response alternatives to each question were 1=Not at all; 2=Just a little; 3=I trust them somewhat; 4=I trust them a lot	0.75	0.25	1	0.82

Table A5. Heterogeneity by gender, disability full sample (N =1298)

	Income	Consumption	Welfare	Saving	Agricultural land	Locus of control
	1	2	3	4	5	4
Treated	0.249***	0.174***	0.197***	0.230**	0.173**	0.177**
	(0.09)	(0.06)	(0.06)	(0.11)	(0.08)	(0.09)
Treated*Female	-0.112	-0.081	-0.081	-0.203*	0.010	-0.209*
	(0.11)	(0.09)	(0.09)	(0.11)	(0.13)	(0.11)
Female	-0.185***	-0.149**	-0.149**	-0.060***	-0.261***	-0.227***
	(0.07)	(0.07)	(0.07)	(0.01)	(0.10)	(0.08)
Constant	-0.048	0.005	0.005	-0.045***	-0.024	0.018
	(0.06)	(0.05)	(0.05)	(0.01)	(0.07)	(0.07)
Controls	No	No	No	No	No	No
Treated +	0.137	0.093	0.082	0.027**	0.183*	-0.033
Treated*Female	(0.09)	(0.08)	(0.09)	(0.01)	(0.10)	(0.10)
Observations	1298	1298	1298	1298	1298	1298

*Note: The table reports ITT regressions where the outcome variable is regressed on treatment status and an interaction by treatment and gender. The outcome variables and covariates are described in Table 5, and the covariates are the same as in that table. Cluster-robust standard errors in parenthesis; * = p<0.1; ** = p < 0.05; *** = p <0.01.*

Table A6. Heterogeneity by wealth, disability main sample (N = 1120)

	Income	Consumption	Welfare	Saving	Agricultural land	Locus of control
	1	2	3	4	5	6
Treated	0.225**	0.098	0.154*	0.044***	0.226**	0.113
	(0.09)	(0.06)	(0.08)	(0.01)	(0.10)	(0.09)
Treated*Wealth	-0.042	0.050	-0.006	0.229	-0.137	-0.011
	(0.11)	(0.09)	(0.13)	(0.15)	(0.13)	(0.12)
Wealth	0.219***	0.166***	0.157**	0.054***	0.212**	0.059
	(0.05)	(0.06)	(0.08)	(0.02)	(0.09)	(0.07)
Constant	-0.221***	-0.136***	-0.194***	-0.097***	-0.233***	-0.096
	(0.06)	(0.04)	(0.06)	(0.01)	(0.08)	(0.07)
Treated +	0.182*	0.148*	0.148	0.273*	0.892	0.103
Treated*Wealth	(0.09)	(0.08)	(0.10)	(0.15)	(0.09)	(0.12)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1120	1120	1120	1120	1120	1120

Note: The table reports ITT regressions where the outcome variable is regressed on treatment status and the interaction between treatment status and a dummy for above median baseline wealth (Treated*Wealth). The outcome variables and covariates are described in Table 5, and the covariates are the same as in that table. Cluster-robust standard errors (clustered on location) in parenthesis; * = p<0.1; ** = p < 0.05; *** = p <0.01.

Table A7. Heterogeneity on compete, risk and trust, by gender, disability main sample (N = 1120)

	Compete	Risk	Trust
	1	2	3
Treated	0.012	0.051	0.062
	(0.09)	(0.10)	(0.10)
Treated*Female	-0.141	-0.076	-0.026
	(0.12)	(0.12)	(0.12)
Female	0.122	0.093	-0.0126
	(0.10)	(0.09)	(0.09)
Constant	-0.441***	0.084	-0.063
	(0.13)	(0.13)	(0.12)
Treated + Treated*Female	-0.129	-0.024	0.036
	(0.09)	(0.10)	(0.09)
Controls	Yes	Yes	Yes
Observations	1120	1120	1120

*Note: The table reports ITT regressions where the outcome variable is regressed on treatment status and the interaction between treatment status and a dummy for being female (Treated*Female). The outcome variables and covariates are described in Table 5, and the covariates are the same as in that table. Cluster-robust standard errors (clustered on location) in parenthesis; * = p<0.1; ** = p < 0.05; *** = p <0.01.*

Table A8. Attitudes to disabled, by gender, village sample

	Choice of disabled woman	Choice of disabled man	Discriminate	Heard of NUDIPU
	1	2	3	4
Treated	0.016	0.007	-0.020	0.133**
	(0.06)	(0.07)	(0.02)	(0.07)
Female	0.001	0.041	0.019	-0.201***
	(0.05)	(0.06)	(0.01)	(0.04)
Treated*Female	-0.043	-0.104	0.019	-0.035
	(0.07)	(0.08)	(0.02)	(0.07)
Age	-0.002**	0.001	-0.00	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Farming	0.001	-0.035	0.020*	-0.061
	(0.04)	(0.04)	(0.01)	(0.04)
Constant	0.392***	0.469***	0.094***	0.474***
	(0.07)	(0.08)	(0.02)	(0.08)
Observations	675	675	675	675

*Note: The table reports ITT regressions where the outcome variable is regressed on treatment status for the village sample and the interaction between treatment status and a dummy for being female (Treated*Female)., with covariates Female, Age in number of years, and Farming, which takes the value one if farming is the main source of income. Cluster-robust standard errors in parenthesis; * = p<0.1; ** = p < 0.05; *** = p <0.01.*

Appendix B1: Baseline questionnaire

SURVEY ON RURAL DEVELOPMENT, UGANDA 2013

SECTION 0
"My name is (name of interviewer). I am an interviewer working on a study of rural development in Uganda, run by NUDIPU and the Norwegian School of Economics. The objective of the survey is to identify strategies to empower the rural population, and in particular women and the people with disabilities.

The information that you provide us with is strictly confidential and only for research purposes. With that aim, we would like to ask you some questions about your
background and your livelihood. The interview will take about an hour. Your participation is absolutely voluntary and your privacy will be respected with all responses.

At this time, would you care to ask me anything about the study? May we begin the survey now?"

SECTION 1
1.1 Name of participant (first name, family name)
1.2 Gender
1.3 Age (in completed number of years)
1.4 Address of respondent
1.5 Sub county
      Parish
      Village
1.6 Participant's phone number
1.7 Civil status
      1=Married/partner and living with my spouse/partner
      2=Married/partner, but not living together 3=Divorced
      4=Unmarried/ no partner 5=Widowed 6=Other, please specify
      If other, please specify _____
1.8 What is the highest level of school you have completed? (Report the number (1-7) that corresponds to the participant's school level. You may only report one number) 1=None 2=Nursery/ pre-school 3=Primary 4=Secondary 5=Vocational 6=Tertiary 7=University

1.9 Is anybody else from your household taking part in this project, that is meeting us and answering questions? If YES: who is this?

SECTION 2. Respondent's household members
Write 999 in the next box of "Name of household member" when there are no more household members to be reported. NOTE: A household is a person or people, related or unrelated, who live together, who acknowledge a head of household, and who ate their meals together for at least 6 of the last 12 months. Infants, newlyweds, and others present for less than six months are household members if they expect to remain. Those who are students and seasonal workers who have not been living in another household. Servants and farm workers are members if they live and eat there. People who live in the same dwelling, but who do not share food expenses or eat meals together, are not members. Visitors are not members. Polygamous marriages are separate households if each wife and her children live and eat separately.

2.1 Name of household members.
2.2 Gender of [name]?
2.3 How old is [name] (in completed years)?
2.4 Does [name] currently attend school? (write 999 for ages other than 3-25)
2.5 Are the school fees of [name] paid for the current term?

2.6 During the last 12 months, have any of the children in your household been sent away from school?

2.7 Were they sent away due to lack of payment of school fees, or because the child did not have a uniform, school books, or scholastic materials?

If NO: Comment on why they were sent home

2.8 If YES: How many of the children in your household have been sent home due to lack of such as payment, uniform or scholastic materials?

2.9 During the last 12 months, have you bought a school uniform to any of your children?

2.10 During the last 12 months, have you bought school books or other scholastic materials for any of your children?

2.11 Do you or your household own a house?

2.12 How many rooms are there in the house in which you live?

2.13 What is the major construction material of the roof of the house in which you live?

1=Thatch, straw, papyrus or other 2=Iron sheets or tiles (write 1 or 2)

2.14 What is the major construction material of the external wall of the house in which you live?

1=Un-burnt bricks, mud and poles, thatch/straw, timber, stone, burnt bricks with mud, or other
2=Burnt bricks with cement or cement blocks

2.15 What is the main source of lighting in the dwelling in the house where you live?

1=Firewood 2=Tadooba or candle 3=Paraffin lantern 4=Electricity (grid, generator, solar)

2.16 What is the type of toilet that is mainly used by the members of your household?

1=Bush (none) 2=Covered pit latrine (private or shared) 3=Uncovered pit latrine 4=VIP latrine (private or shared) 5=Flush toilet (private or shared) 6=Other

2.17 Do you or your household members possess any of the following assets

      Building
      Livestock e.g. goats, cattle, sheep, etc.
      Poultry e.g. turkeys, chicken, ducks, etc.
      Food gardens
      Plots of land
      Granary
      Ox ploughs
      Ox cart
      Oxen
      Modern household utensils, e.g glassware, kitchenware etc
      Motor cycle
      Bicycle

2.18 Do you or any member of your household own electronic equipment (e.g. TV, radio, cassette, mobile phone etc.) at present?

2.19 Including yourself, does every member of the household have at least two sets of clothes?

2.20 Including yourself, does every member of the household have at least one pair of shoes or sandals?

2.21 How many meals did you eat yesterday?

2.22 During the last year, how many meals did you eat per day?

2.23 During the last year, in a normal week, how many days did you have meat or fish? (0-7)

2.24 During the last 12 months, how much have you spent (in Ush.) on new clothes for yourself?

SECTION 3

3.1 During the last 12 months, have you had income from employment (not self-employment)?

If YES: In how many of the last 12 months have you had income from employment?

If YES: In a normal week during the months that you had employment, how many days did you have employment?

If YES: Comment on what kind of employment

3.2 During the last 12 months, have you had income from crop farming, poultry or livestock farming?

If YES: In how many of the last 12 months have you had income from crop farming poultry or livestock farming?

If YES: Comment on what kind of crop farming, poultry or livestock farming

3.3 During the 12 last months, have you had income from non-farming business?
If YES: In how many of the last 12 months have you had income from non-farming business?
If YES: Comment on what kind of business
3.4 During the last 12 months, rank the MOST IMPORTANT sources of income, with 1 being the most important and up to 6, or as many as are applicable being the least important. For all other income sources that do not apply write 999.

     Employment
     Farming (produce, poultry and livestock)
     Business (non-farming)
     Support from spouse and family, including remittances
     Begging
     Other
     If OTHER, specify the source of income

3.5 During the last 12 months, what has your income been from the sources below? (write 999 where there was no income)
3.5.1 Source: Employment
How much is your highest weekly income from employment?
How much is your average weekly income from employment?
How much is your lowest weekly income from employment?

3.5.2 Source: Farming (produce, poultry and livestock)
How much is your highest weekly income from farming?
How much is your average weekly income from farming?
How much is your lowest weekly income from farming?

3.5.3 Source: Business (non-farming)
How much is your highest weekly income from business?
How much is your average weekly income from business?
How much is your lowest weekly income from business?

3.5.4 Source: Support from spouse and family, including remittances
How much is your highest weekly income from support?
How much is your average weekly income from support?
How much is your lowest weekly income from support?

3.5.5 Source: Begging
How much is your highest weekly income from begging?
How much is your average weekly income from begging?
How much is your lowest weekly income from begging?

3.5.6 Source: Other, specify:
How much is your highest weekly income from this other source?
How much is your average weekly income from this other source?
How much is your lowest weekly income from this other source?

SECTION 4
4.1 Which of the following statements represents your views?
You don't know how to save
You don't need savings
You don't have enough money to save
You only have a little money and you don't save because the deposits would be too small
You don't know anybody who saves
It is too risky to save as you don't have a toorisky safe place to store your money
You want to take a loan instead of saving
There are too many commitments to spend your money on instead of saving

Whenever you have money you feel tempted to spend it

Your family/ spouse won't let you save

The places to save which you know of (MFI, SACCO, savings group, Mobile-Money etc.) are too risky

The places to save which you know of (MFI, SACCO, savings group, Mobile-Money etc.) are too far away

The places to save which you know of (MFI, SACCO, savings group, Mobile-Money etc.) are too expensive

You prefer to invest your money in your business activities rather than to save your money

You prefer to share your money with your family rather than to save your money

You prefer to share your money with friends (e.g. drinking and eating) rather than to save your money

4.2 Your savings. What are your current savings balances in the following (in Ush):

At informal savings groups (Merry-go-around, VSLA etc.)

At semi-formal credit and savings institution (like SACCOs)

At MFIs

At commercial banks

With relatives or business partners (money clients have lent to others is considered savings)

Mobile savings (e.g MTN-Mobile Money, Warid-Pesa, Airtel-Money)

Money hidden in a safe place

If you have goods, crops, land, livestock, and any other assets, what is the total estimated price you would be able to sell them for?

Other (If there is no other type of savings please input 999)

Specify other:

4.3 Are you currently a member of a village savings group? (Y=1, N=0)

Have you EVER been a member of a savings group before now?

Your loans. What are your loan balances today in the following (in Ush):

At informal credit and savings groups (Merry-goaround, VSLA etc)

At semi-formal credit and savings institution (like SACCOs)

At MFIs

At commercial banks

With relatives or business partners (money clients have lent from others is considered loans)

Mobile loans (e.g MTN-Mobile Money, Warid-Pesa, Airtel-Money)

Other (If there is no other type of loan please input 999)

Specify other:

4.4 If you managed to get Ush 200 000/=, how would you spend it? (For each item, write amount in Ush. The total should be Ush 200 000/=)

Children's education (school fees, uniform etc.)

To buy land or invest in the house

Business purposes (start a new business or buy machinery business or inputs to existing business)

Buy something nice for myself (new clothes, cell phone, nice jewelry, a bicycle, alcohol and good meals etc.)

Pay back a loan

Other (If there is no other type input 999)

Specify if other:

4.5 During the last 12 months, have you or your household been forced to sell some of your valuable assets like cell phone, poultry, land, livestock or equipment to meet an emergency?

If YES: Explain

4.6 Do you have agricultural land?

4.7 Do you use fertilizer on this land?

4.8 Do you use improved seeds on this land?

4.9 Do you irrigate this land?

SECTION 5
5.1 In general, how is your life compared to other people in your village?
      1=Much better 2=Better 3=Same 4=Worse 5=Much worse
5.2 How do you think your life will be in the future compared to now?
      1=Much better 2=Better 3=Same 4=Worse 5=Much
5.3 Overall, how SATISFIED are you with your life as a whole these days? (0-10)
5.4 Overall, how HAPPY were you with your life as a whole these days? (0-10)
5.5 Overall, how WORRIED are you with your life as a whole these days? (0-10)
5.6 Overall, how MISERABLE are you with your life as a whole these days? (0-10)

SECTION 6
On questions 6.1 to 6.10, please ask the participant to choose between the following four alternatives
on EACH of the questions write 1, 2, 3 or 4 depending on what the answer at each question. 1=Not at
all true 2=Hardly true 3=Moderately true 4=Exactly true
6.1 You can always manage to solve difficult problems if you try hard enough
6.2 It is easy for you to stick to your aims and accomplish your goals
6.3 You are confident that you could deal efficiently with unexpected events
6.4 When you are in trouble, you can usually think of a solution
6.5 How much do you trust each of the following types of people?
1=Not at all 2=Just a little 3=I trust them somewhat 4=I trust them a lot
6.5.1 How much do you trust your relatives?
6.5.2 How much do you trust other people you know?
6.5.3 How much do you trust other people in your community?

SECTION 7
7.1 Do you know how to read and write?
7.2 What is the sum of 250 and 150?
1= 450 2= 350 3= 400 4= 100 5=Don't know
7.3 Which of the following amounts is largest?
1= 10 notes of Ush. 2,000/= each 2= 30 notes of Ush. 1,000/= each 3= 15 notes of Ush. 5,000/= each
4=Don't know
7.4 Peter sold a shirt at Ush. 12,000/= and made a profit worth Ush. 3,500/=. What was Peter's
purchase price for the shirt?
1= Ush. 15,500/= 2= Ush. 9,500/= 3= Ush. 8,500/= 4= Ush. 15,000/ 5=Don't know

SECTION 8
8.1 If you could choose between receiving Ush. 20,000/= tomorrow and Ush. 30,000/= one month
from now, which one would you choose?
1=20,000/= tomorrow 2=30,000/= one month from now

8.2 You can choose between:
1) Safe option: You receive Ush. 500/= in cash
2) Risky option: You receive Ush. 1,500/= if the coin shows heads, but nothing if the coin shows tails.
Which one do you choose?

SECTION 9
Do you have a disability?
If YES (on 9.1a): Describe your disability/disabilities.
Type of disability
At what age did you get this disability? ###
Does anybody in your household (not yourself) have a disability?
If YES: Who in your household has a disability?

SECTION 10
IF THE PARTICIPANT HAS A DISABILITY:
10.1 The next questions ask about difficulties you may have doing certain activities because of a disability (1=No - no difficulty 2=Yes, some difficulty 3=Yes, a lot of difficulty 4= Cannot ----- at all)
Do you have difficulty seeing?
Do you have difficulty hearing?
Do you have difficulty in using your limbs and other body parts to perform routine tasks?
Do you have difficulty learning, remembering or concentrating?
Do you have difficulty with self-care, such as feeding yourself, washing your body or dressing?
Using your usual (customary) language, do you have difficulty communicating (e.g. understanding others, or being understood by others)?

10.2 To what extent do you agree with the following statements? 1=Not at all true 2=Hardly true 3=Moderately true 4=Exactly true)
Your disability makes it very difficult for you to work
People do not think you can do good work because of your disability
People pay you less for work you do just because of your disability
People in your community avoid associating with people with disabilities
You feel socially isolated because of your disability isolated
You sometimes experience disrespect and abuse because of your disability
If you were disabled during your childhood, did you sometimes experience disrespect and abuse because of your disability?

Appendix B2. Follow-up questionnaire
SURVEY ON RURAL DEVELOPMENT, UGANDA 2016

"My name is (name of interviewer)

I am an interviewer working on a study of rural development in Uganda, run by NUDIPU and the Norwegian School of Economics. The objective of the survey is to identify strategies to empower the rural population, and in particular women and the people with disabilities.

The information that you provide us with is strictly confidential and only for research purposes. With that aim, we would like to ask you some questions about your background and your livelihood.

The interview will take about an hour. Your participation is absolutely voluntary and your privacy will be respected with all responses. At this time, would you care to ask me anything about the study? May we begin the survey now?"

SECTION 1 BACKGROUND INFORMATION

ID_number
Name
Gender
Age
Subcounty
Parish
Village
Phone number
Civil status
Have you relocated since 2011?
If yes, why?
- Better house

- Income opportunities
- House was too expensive
- Marital reasons
- Education
- Others

SECTION 2 INCOME, WEALTH AND HAPPINESS

How many of the following do you have?
Turkeys
Chicken
Ducks
Fowls
Pigeons
Goats
Cattle
Sheep
Rabbits
Donkey
Pigs
Dogs

Do you have land?
If yes, how many plots?
Do you own any of these plots?

Do you have agricultural land?
Do you use fertilizer on this land?
Do you use improved seeds on this land?
Do you irrigate this land?

Do you own a non-farming business?
If yes, please describe this business.
Do you own this business?

What is the material on the floor of the house where you live?
- Earth
- Earth and cow dung
- Cement
- Mosaic or tiles
- Other

What is the type of toilet that is mainly used by the members of your household?
- VIP latrine Bush
- Covered pit latrine
- Uncovered pit latrine
- Bush

What is the source of lighting in your house?
- Electricity – grid
- Electricity – generator
- Electricity – solar
- Paraffin

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- Tadooba
- Firewood
- Other

What is the major construction material of the roof of the house in which you live? (1 = iron sheets or tiles, 0 = other)

Do you or your household members possess a bicycle?
Do you or your household members possess a motorcycle?
Do you or your household members have a radio?
Do you have a cell phone?
Do you or your household members possess a TV?
Do you or your household members possess a bicycle?
Do you or your household members possess solar equipment?
During the last 12 months, have you or your household been forced to sell some of your valuable assets like cell phone, poultry, land, livestock or equipment to meet an emergency? (Y=1, N=0)
During the last 12 months, have you had income from employment?
If yes, describe.

Do you own a business?
If yes, describe.

During the last 12 months, have you had income from farming?
If yes, describe.

How would you describe the stability of your income during the last 12 months?
1. Very unstable
2. Somewhat stable
3. Stable

During the last 12 months, have you ever begged for money?

How would you characterize your income contribution to your household?
1. Not at all satisfactory
2. Satisfactory
3. Very satisfactory

Overall, how HAPPY were you with your life as a whole these days? Use a scale from zero to 10, where zero means not at all happy, and 10 is completely happy.

Including yourself, does every member of the household have at least one pair of shoes or sandals?

Which fuel do you use for cooking?
1. Electricity – grid
2. Electricity – generator
3. Electricity – solar
4. Firewood
5. Charcoal
6. Paraffin or kerosene
7. Gas
8. Other

How many meals did you eat yesterday?
During the last year, how many meals did you eat per day?
During the last year, in a normal week, how many days did you have meat or fish? (0-7)

During the last 12 months, have you bought new clothes for yourself?

During the last 12 months, have any of the children in your household been sent away from school?

Have you spent any money on scholastic materials for your children, including school uniforms, school books, etc?

Think back three years: How is your income in general compared to then? 1= Lower, 2 = About the same, 3 = Higher

Think back three years: How is your well-being compared to then? 1= Lower; 2 = About the same; 3 = Higher

In general, how is your life compared to other people in your village? 1=Much better 2=Better 3=Same 4=Worse 5=Much worse

To what extent do you feel that you contribute to the local community?
1 = not at all, 2 = not very much, 3 = neutral, 4 = somewhat, 5 = a lot

How do you think your life will be in the future compared to now?
1=Much better 2=Better 3=Same 4=Worse 5=Much worse

SECTION 3. SAVINGS

Which of the following statements represents your views?

You don't know how to save

You don't need savings

You don't have enough money to save

You don't know anybody who saves

It is too risky to save as you don't have a safe place to store your money

You want to take a loan instead of saving

There are too many commitments to spend your money on instead of saving

Whenever you have money you feel tempted to spend it

Your family/ spouse won't let you save

You prefer to share your money with your family rather than to save your money

What are your current savings balances (at savings groups, at banks, at home, with friends and family, etc)?

If you managed to get Ush 200 000/=, how would you spend it?
(For each item, write amount in Ush. The total should be Ush 200 000/=)
1. Children's education (school fees, uniform etc.)
2. To buy land or invest in the house
3. Business purposes (start a new business or buy machinery business or inputs to existing business)
4. Buy something nice for myself (new clothes, cell phone, nice jewelery, a bicycle, alcohol and good meals etc.)
5. Pay back a loan
6. Other

SECTION 4. ABILITIES

Do you know how to read and write?

What is the sum of 250 and 150? (Let the participant choose between the following alternatives, and write 1, 2, 3, 4 or 5 depending on the answer)
1= 450 2= 350 3= 400 4= 100 5=Don't know

Which of the following amounts is largest? (Let the participant choose between the following alternatives, and write 1, 2, 3 or 4 depending on the answer)
1= 10 notes of Ush. 2,000 2= 30 notes of Ush.1,000; 3= 15 notes of Ush. 5,000; 4=Don't know

Peter sold a shirt at Ush. 12,000/= and made a profit
worth Ush. 3,500. What was Peter's purchase price for the shirt? (Let the
participant choose between the following alternatives, and write 1, 2, 3,
4 or 5 depending on the answer)
1= Ush. 15,500
2= Ush. 9,500
3= Ush. 8,500
4= Ush. 15,000
5=Don't know

Number of items remembered in memory game

SECTION 5. ENTREPRENEURIAL MINDSET

Competition choice. Fixed rate or competition rate?
If you could choose between receiving Ush. 20,000 tomorrow and Ush. 30,000 one month from now,
which one would you choose?
1=20,000/= tomorrow 2=30,000/= one month from now

You can choose between:
1) Safe option: You receive Ush. 500/= in cash
2) Risky option: You receive Ush. 1,500/= if the coin shows heads, but nothing if the coin shows tails.
Which one do you choose?

Which statement do you agree most with:

STATEMENT A: Competition is good. It stimulates people to work hard and develop new ideas
STATEMENT B: Competition is harmful. It brings out the worst in people

STATEMENT A: In the long run, hard work usually brings a better life
STATEMENT B: In the long run, hard work doesn't generally bring success—it's more a matter of luck
and connections

STATEMENT A: People can only get rich at the expense of others
STATEMENT B: Wealth can grow so there's enough for everyone

SECTION 6. LOCUS OF CONTROL
Which statement do you agree most with?

STATEMENT A: The things that happen in your life are of your own doing.
STATEMENT B: You don't have much control over what happens in life, or in the direction your life is
headed.

Please ask the participant to choose between the following four alternatives on EACH of the
questions write 1, 2, 3 or 4 depending on what the answer at each question. 1=Not at all true
2=Hardly true 3=Moderately true 4=Exactly true

You can always manage to solve difficult problems if you try hard enough
It is easy for you to stick to your aims and accomplish your goals
You are confident that you could deal efficiently with unexpected events
When you are in trouble, you can usually think of a solution

How much do you trust each of the following types of people (1=Not at all 2=Just a little 3=I trust
them somewhat 4=I trust them a lot)

Write 1, 2, 3 or 4 depending on their answer.
How much do you trust your relatives?
How much do you trust other people you know?
How much do you trust other people in your community?

SECTION 7. ATTITUDES

On the whole, men make better leaders than women do.
A university education is more important for a boy than for a girl.
Answer by scale 1-5 where 1 = Fully disagree, 2 = Somewhat disagree, 3 = Neither agree nor disagree, 4 = Somewhat agree, 5 = Fully agree

Children with disabilities do not need to go to school.

When children with disabilities reach maturity, they can marry

Persons with disabilities are bad luck.

It is acceptable to leave a disabled child tied onto a bed or chair if there is nobody to watch them when the caregiver is out of the home.

Children with disabilities need the same amount of food as other children.

Children with disabilities should not be allowed to play with other children.

Persons with disabilities cannot do good work given the opportunity.

Do you have a disability?

If yes, what kind (physical, hearing, visual, mental, albino, other)? What is the severity of your disability (1-3)?

Appendix C. Pre-analysis plan

We Can Manage! – A randomized experiment on inclusive microfinance in rural Uganda

Pre-Analysis Plan of long-term follow-up

Date: September 26, 2016

Outline:

1. Abstract
2. Interventions
3. Design
4. Randomization method
5. Sample size
6. Long term outcomes
7. Heterogeneous effects
8. Covariates
9. Equations to be estimated
10. Multiple outcomes
11. Attrition
12. ITT – ATE
13. References

The timeline of the present project is as follows:

- Baseline study: July-August, 2013 (questionnaire attached)
- Intervention: December 2013-March 2014
- Short-term follow-up study: June 2015
- Long-term follow-up study: July-August, 2016 (questionnaire attached)
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This pre-analysis plan has been written prior to accessing the data for the long-term follow-up and pre-commits the authors to defined specifications for estimating impacts.[7] It was written by Kjetil Bjorvatn and Bertil Tungodden.

1. Abstract

There are a billion people in the world with some kind of disability. The disabled generally have poorer health, lower education achievements, fewer economic opportunities and higher rates of poverty than people without disabilities, and particularly so in developing countries. In Uganda, according to official statistics, the disabled account for 7 percent of the population as a whole, but 25 percent of the population below the $1.25 a day poverty line (Government of Uganda, 2008). The World Report on Disability (2011, page xi) argues that: "To achieve the long-lasting, vastly better development prospects that lie at the heart of the 2015 Millennium Development Goals and beyond, we must empower people living with disabilities and remove the barriers which prevent them participating in their communities; getting a quality education, finding decent work, and having their voices heard."

The ambition of this project is to evaluate the impact of an inclusive microfinance program called 'We can manage!', targeting disabled people in rural Uganda. The idea behind the program, which also has a gender focus, is to reduce financial barriers and build capacity and confidence among the participants in the microfinance program, and to reduce prejudice in society by demonstrating the ability of disabled to manage and mobilize resources.

The key question of our research is:

- Does the program lead to economic empowerment and increased well-being?

To further study potential mechanisms underlying a positive treatment effect, we also investigate the following research question:

Does the program lead to changes in business attitudes and in attitudes to disability and gender among the disabled?

In addition to the main research questions, which focus on the impact on the disabled individuals in the program, we will also study whether the program also influences the non-disabled members of the program and members of the local society more broadly.

In order to answer these questions, we carry out a randomized control trial (RCT), where some villages are randomly assigned to the treatment group, where the program is implemented and the remainder assigned to the control group, where the implementation of the program is delayed. On average, the two groups should therefore be identical on both observables and unobservables, and any statistically

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[7] In the event that the structure of the data or other unforeseen factors necessitate adjustments in the methodology and specifications to be employed in the analysis, such adjustments will be documented with reference to the original specifications in this pre-analysis plan and accompanied by a justification of why such adjustments were necessary.

significant post-treatment difference between the two groups can therefore be interpreted as a causal effect of the   'We Can Manage!' program.

We carry out both a short-term and long-term follow-up study. The short-term follow-up study took place in June 2015, that is, a year and a half after the initiation of the treatment, while the long-term follow-up took place in July-August 2016. The short-term follow-up was conducted on a subset of the participants and focused on school enrolment and mind-set variables. The long-term follow-up survey covers the entire sample and is a comprehensive survey on a wide range of outcome variables, including economic outcomes. Moreover, it seeks to capture the impact on attitudes to disabled from non-members of the savings groups in the local community, targeting households in the vicinity of the meeting places of the groups.

2. Background
"We Can Manage!" (WCM) is a village savings and loans association (VSLA) organized by the National Union of Disabled Persons of Uganda (NUDIPU), *targeting disabled people* in rural Uganda. Each group in the association consists of 30 members, where the majority of both management and group members are disabled. The group members meet on a weekly basis, where each member saves one to five shares, each share typically worth 2000 Ush (0.8 USD). The saving is recorded in the savings book of the group. There is also saving for an emergency fund, typically 500 Ush per week. Loans are given to group members according to demand and need. NUDIPU helps organize the groups and provides training during the first year, on how to manage the group, savings, and loans, but does not provide any direct financial assistance.

The savings- and loans cycle is typically one year, after which there is a "share-out", when all savings and interest payments are divided by the number of shares and paid out. The group then decides on whether to start a new cycle or not. In most cases, they do. VSLAs function like small, unregulated financial institutions, providing members with a safe place to save regularly, an accessible source of credit, and a solidarity fund for emergencies.

The VSLAs can cause economic empowerment and improved well-being by stimulating savings and providing access to credit. VSLAs stimulate savings by offering people a safe place to store their money (in VSLAs, money is stored in a cashbox, locked with three padlocks, and with three different members holding a key to the box, and with the box being stored in the house of a fourth member). The possibility of moving money out of the house, and out of the sight of husbands or other family members, may be an important rationale for joining a savings group (Anderson and Baland, 2002). Perhaps equally important, the VSLAs can serve as a commitment device (in case of hyperbolic preferences) and a reminder (a "nudge") to save (Ashraf, Karlan, Yin, 2006). With limited access to formal finance and insurance, the savings groups also provides an easily accessible and reasonably priced access to credit and insurance. However, VSLAs can also cause important changes in the mindset of the participants, by causing them to adopt more business minded attitudes and by changes their attitudes to disability.

3. Design
We included 75 newly recruited groups from Manafwa, in Eastern Uganda in the study. A baseline survey was conducted during July and August 2013, with a total of 1911 participants, that is, an average of around 25 members interviewed in each group. The survey contained a broad set of questions on socio-economic background, business knowledge, financial practices, confidence, optimism and trust. The implementation of the project was facilitated by NUDIPU, and with local clearance through meetings with the Executive Committee of Manafwa District Union (Disability leadership) as well as with the District Local Council leadership.

The groups were subsequently randomly allocated to the control arm or to the treatment arm. The groups in the treatment arm were activated by NUDIPU Field Promoters in the period December 2013 – March 2014, while the groups in the control arm where told that the start up of the program would

take place when the piloting of this program was completed (which is equivalent to the completion of the present research project).

The activation consisted of a training program and the facilitation of the startup period in the group, including technical assistance, both in terms of how to write a constitution, how to access the saving box and keys (which are provided to the groups at cost-price), and more generally how to run the group.

4. Randomization method
The randomization procedure was as follows: First, in order to minimize spillovers between treatment and control groups, we constructed 63 unique "locations", where a location could consist of more than one group in case a village supplied members into multiple groups. The groups linked by common village membership would then belong to the same location. In contrast, when a village only supplied participants into one group, the location would consist of a single group. Second, we randomly allocated the locations to treatment (31) or control (32). There are 35 groups in the treatment locations, and 40 groups in the control locations.

Randomization unit
We randomized at the location level. In each location, the unit of observation is all the group members.

Is the treatment clustered – YES/NO
Yes, the treatment is clustered at the location level.

5.1 Sample size –number of clusters
There are 63 clusters (that is, 63 locations).

5.2 Sample size –number of observations
Main sample: The main sample consists of our baseline sample of 1911 participants. However, some group members were not interviewed at baseline (due to absence at time of interview, etc) but were subsequently interviewed at the end line. While the main sample consists of those for which we have baseline information, we will also report results using as sample *all* those interviewed at the end line, but then with a more limited set of controls.

Village sample: We also carry out a long-term survey among villagers living in the vicinity of the meeting places of the We Can Manage groups in our sample (and the natural meeting place of the control groups), in order to gauge impact of program on attitudes to disability among non-members. We will call this the "village sample", consisting of 675 participants (we targeted 6-10 villagers for each loan group).

5.3 Sample size – number of clusters per arm
There are 31 clusters in the treatment arm, and 32 clusters in the control arm.

5.4 Sample size – MDE for main outcome
The sample size was powered to detect changes in *number of meals per day,* which we believe is an important measure of economic empowerment and wellbeing. Ksoll et al (2016) find treatment effects on this variable in a similar study of VSLA in Malawi (not targeting disabled). They find that one in seven households consumed an extra meal as a result of the treatment, with an average number of meals per day at baseline of 2.65.

In our baseline data, the average number of meals per day is two, and only 20 percent of the participants reported that they had at least three meals the day before the interview. Thus, our sample

seems to be poorer than that in Ksoll et al, and we interpret this as the potential for improvement being greater. With an inter-cluster correlation of 0.05, we have a power of at least 90% (with a 5% confidence interval) to detect a 10-percentage point increase in the share of the participants who had at least three meals per day.

Village sample: The size of the village sample was based on practical and budgetary constraints.

6. Outcomes
We measure key outcomes on three main dimensions, each consisting of a sub-group of related outcomes.

1. Economic empowerment and wellbeing
    1.1 Life improvements
    1.2 Meals
    1.3 Assets
    1.4 School outcomes
    1.5 Happiness and wellbeing

2. Business related attitudes
    1.1 Locus of control
    1.2 Willingness to compete and take risk
    1.3 Trust
    1.4 Growth orientation

3. Attitudes to gender and disability

6.1 Economic empowerment and wellbeing

6.1.1 Life improvements

- *Wellbeing*: How is your general wellbeing compared to three years ago? Measured from 1- 3, where 1 is "Worse" and 3 is "Better"
- *Income now and then*: The respondent's perception of own current income compared to three years ago, measured from 1- 3, where 1 is "Worse" and 3 is "Better"
- *New clothes*: Whether the respondent has bought new clothes for himself/herself during the last 12 months

6.1.2 Meals

- *Meals yesterday*: Number of meals the day before the interview
- *Meat/fish*: Number of meals containing meat or fish in a normal week during the last 12 months.

6.1.3 Assets

- *Animal assets:* Measured by an index of ownership of farm animals (turkeys, chickens, ducks, etc).
- *Ownership of land*: Whether or not the respondent owns a plot of land.
- *Type of toilet:* Whether or not the respondent has an uncovered pit latrine (or better).
- *Bicycle:* Whether or not the household of the respondent owns a bicycle

6.1.4 School outcomes

- *Sent home*: Whether or not any of school children in the household has been sent home from school during the last 12 months due to lack of payment of school fees etc.
- *Scholastic material*: Whether the respondent has bought any scholastic material for the children in the household during the last 12 months.

6.1.5 Happiness and wellbeing

- *Happiness:* Measured on a scale from 0-10, where from 0 - 10, where zero means not at all happy, and 10 is completely happy.
- *Life compared to village*: How is your life compared to other people in your village? Answers on a scale from 1-5, where 1 is much worse and 5 is much better.

6.2 Business related attitudes

6.2.1 Locus of control

- *Locus of control* 1: A dummy variable, which takes the value one if the respondent agrees more with statement A than statement B (and zero otherwise), where statement A is "The things that happen in your life are of your own doing" and statement B is "You don't have much control over what happens in life, or in the direction your life is headed".
- *Locus of control 2*: Index showing the response to four statements on locus of control, measured from 1 to 4, where 1 = not at all true, and 4 = exactly true.

6.2.2 Willingness to compete and take risk

- *Competitive*: A variable taking the value one if the respondent chooses the competition rate in a memory game, and zero if the respondent chooses the fixed rate.
- *Risk*: A variable taking the value one if the respondent chooses the risky option in a hypothetical choice between a fixed amount of 500 Ush or a risky choice, which brings 1500 Ush with 50 percent probability and zero with 50 percent probability.
-
6.2.3 Trust

- *Trust*: Index showing the response to three statements on trust, measured from 1 to 4, where 1 = not at all true, and 4 = exactly true.

6.2.4 Growth orientation
- *Competition good*: A variable taking the value one if the respondent states that competition is good, and zero otherwise.
- *Hard work*: A variable taking the value one if the respondent states that hard work brings a better life, and zero otherwise.
- *Positive growth*: A variable taking the value one if the respondent states that wealth can grow so that there is enough for everybody, and zero if the respondent states that people only can get rich at the expense of others.

6.3 Attitudes to gender and disability

6.3.1   Disability equality: An index of seven questions on gender equality, where the questions are formulated as statements on the rights of persons with disability, and where the responses range from 1-5, where 1 = Fully disagree and 5 = Fully agree.

6.3.2   Gender equality: An index of two questions on gender equality, where the questions are formulated as statements on gender equality, and where the responses range from 1-5, where 1 = Fully disagree and 5 = Fully agree.

7. Heterogeneous effects (variables from the baseline survey)
In addition to measuring the global impact of the treatments, we will also study heterogeneous effects along variables covering what we consider important dimensions in determining the impact of the intervention; disability status, gender, and wealth (baseline).

   1) HET1 – Disability status. Is the participant disabled or non-disabled?
   2) HET2 – Gender. Is the participant male or female?
   3) HET3 – Wealth. Above or below the median in terms of a baseline wealth index?

8. Covariates (variables from the baseline survey)
(i) The following covariates, taken from the baseline survey, will be used in the analysis:
   - Disability status: Indicator variable, taking the value one if respondent is disabled, and zero otherwise.
   - Gender: Indicator variable taking the value one if respondent is female, and zero if male.
   - School fees: Indicator variable taking the value one if school fees have not been paid for all school children in the household, and zero otherwise.
   - Age: Indicator variable taking the value one if respondent is older than median age in the baseline sample, and zero otherwise.
   - Wealth index: Based on condition of house, ownership of animals and agricultural equipment, clothing and shoes, number of meals per day, etc. Indicator variable taking the value one if wealth index is above median, and zero otherwise.
   - Knowledge index: Based on self-reported literacy, and three financial literacy questions. Indicator variable taking the value one if the respondent is above median on the knowledge index, and zero otherwise.
   - Marital status: Indicator variable taking the value one if respondent is married, and zero otherwise.

9. Treatment effect equation to be estimated
The following equations will be estimated using ordinary least squares estimators.

We first regress the outcome of interest on treatment status (Ti):

(1) $Y_i = \alpha + \beta_1 T_i + \varepsilon_i.$

We cluster the standard errors at the location-level. Since treatment is randomly assigned, we obtain consistent estimates of the causal impact of the intervention.

Furthermore, we will also estimate equation (1) with a set of covariates **X:**

(2) $Y_i = \alpha + \beta_1 T_i + \beta_2 X_i + \varepsilon_i$

10. Heterogeneity in treatment effects

Finally, we will also study heterogeneity in treatment effects using the variables defined in the "heterogeneous effects" section above. We will then introduce interaction terms, where the treatment dummy will be interacted with the relevant variable:

(3) $Y_i = \alpha + \beta_1 T_i + \beta_2 X_i + \beta_3 W_i + \beta_4 W_i * T_i + \varepsilon_i,$

where W stands for the variable defining the heterogeneous effects of interest. Equation (3) will also be estimated without the covariates X.

We will run both separate regressions for each of the background variables, where only the interaction terms for this background variable is added to (2), and a joint regression including interaction terms for all the background variables introduced in the "heterogeneous effects" section above.

10. Dealing with multiple outcomes

We will use the approach of Niklas Buehren, Robin Burgess, Markus Goldstein, Selim Gulesci, Imran Rasul and Munshi Sulaiman (2015) "Women's Empowerment in Action: Evidence from a Randomized Control Trial in Africa," and make cumulative indices on related outcomes.

11. Addressing survey attrition and non-response
In the case that survey attrition is correlated with the treatment, we will follow Kling, Liebman and Katz (2007) and report lower bounds of the treatment effects by replacing missing observations in the treatment (control) arms by the corresponding arm's mean value minus (plus) 0.05, 0.10 and 0.20 standard deviations of the control group. Upper bounds of the treatment effects are constructed in a symmetrical way.

No imputation for missing data from item non-response at follow-up will be performed. We will check whether item non-response is correlated with treatment status following the same procedures as for survey attrition, and if it is, construct bounds for our treatment estimates that are robust to this.

12. ITT – ATE
We focus on intention-to-treat effects in our key results We hypothesize that the intervention will *increase* economic empowerment and wellbeing, *strengthen* business related attitudes, and *positively* affect attitudes to females and disabled. Given the pre-specified nature of the hypotheses and our strong prior that impacts will be positively signed, we plan to carry out one-sided hypothesis tests for the main outcomes (where we will test whether we can reject the one-sided hypotheses that the effects of the intervention are non-positive.) We will also follow the more standard approach in economics and present p-values implied by two-sided hypotheses tests.

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