Sustaining Impacts When Transfers End:
Women Leaders, Aspirations, and Investments in Children

Karen Macours* and Renos Vakis**

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Abstract

Numerous evaluations show that conditional cash transfer programs change households' investments in their young children, but there are many open questions about how such changes can be sustained after transfers end. This paper analyzes the role of social interactions with local female leaders for sustaining program impacts. The social interactions are identified through the randomized assignment of leaders and other beneficiaries to different cash transfer packages. Random exposure to leaders that received the largest package was found to augment short-term program impacts on households' investments in education and nutrition, and to affect households' attitudes towards the future during the intervention. This paper shows that the strong social multiplier effects from leaders' treatment persisted two years after the end of the program. Households randomly exposed to female leaders with the largest package sustained higher investments in their children and reported higher expectations and aspirations for the future of their children. These results suggest that program design features that enhance ownership of a program's objectives by local leaders may shift other beneficiaries' norms and sustain higher levels of human capital investments.

Keywords: social interactions, leaders, human capital investments, randomized trial, impact evaluation, aspirations, conditional cash transfers

* Paris School of Economics and INRA; ** World Bank

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1. Introduction

The intergenerational transmission of poverty often occurs through low levels of investment in education and nutrition. Conditional cash transfer programs (CCTs) and many other development interventions therefore specifically aim to increase human capital investment by the poor. A large body of evidence shows that CCT programs have been successful in augmenting investment in education and nutrition in many settings (Fiszbein and Schady, 2009; Ganimian and Murnane, 2014). A key question is whether CCTs can have lasting impacts on investment behavior after households stop receiving transfers. Only a few papers study whether the impacts on households' human capital investments persist after such programs end, and the evidence is mixed (Macours, Schady and Vakis, 2012; Baird, McIntosh and Ozler, 2016). Even less is known about the possible mechanisms underlying persistence. A better understanding is needed to derive lessons regarding optimal design of new programs and adjustments to existing ones. More generally, knowing whether and how short-term programs can result in long-term increases in human capital investment is important for policy design.

For programs to have a persistent effect on households' human capital investments, they need either to permanently lift existing liquidity constraints, or to change the value households attribute to investments in education and nutrition.[1] The latter may occur if the interventions increase the perceived returns to such investments by reducing information asymmetries or changing preferences. Nguyen (2008) and Jensen (2010) show that changes in the perceived returns to schooling through information can lead to educational gains. Recent evidence also suggests the potential of external interventions to shift preferences by changing parents' aspirations for their children (Beaman et al., 2012; Bernard et al., 2014).[2]

Understanding how to design interventions to maximize such shifts hence becomes an important policy

[1] If some decisions are driven by habits, a program that changes habits can also have a persistent effect.

[2] External interventions can also change the aspirations of children themselves (Wydick, Glewwe and Rutledge, 2013) or aspirations of adults for themselves (Lybbert and Wydick, 2016).

question. Several design features of CCT programs could be contributing to shifts in investment behavior. CCTs typically include heavy social marketing and conditionalities enforcing attendance at regular meetings in which the nutritional, health and educational objectives are discussed. To the extent that such messages get internalized, one could expect increased human capital investments to persist. Targeting the transfers to women in the household could shift gender norms regarding decision making within the household, and this too could persist after the transfers stop. Often programs also assign specific roles to key women in the community to re-enforce the messages, but causal evidence on their specific role is rare.[3]

This paper shows that interactions with local female leaders can contribute to the persistence of a program's impacts, by providing evidence for a CCT pilot program in Nicaragua. It builds on Macours and Vakis (2014), where we showed that exposure to successful and motivated female leaders substantially increased impacts on nutritional and educational investments, as well as future-oriented attitudes, while the program was operating. This paper analyzes whether these shifts were sustained after the program ended. A priori the answer is not obvious. Increasing aspirations in the presence of many other remaining constraints may lead to only short-term gains, and households could revert back to pre-program behavior when the transfers stop. On the other hand, if social interactions during the program changed norms and beliefs regarding human capital investments, the increased investment levels could persist even after the end of the program. Macours, Schady and Vakis (2012) show that the Nicaraguan CCT indeed had persistent effects on parental investments in early childhood. This paper helps explain why.

Using data collected two years after the program ended, we show that social interactions with successful and motivated leaders were crucial for the persistence of the educational and nutritional investment. Two years after the transfers stopped, former beneficiaries who live in the proximity of such leaders still show

[3] The importance of these local female leaders has been recognized in several qualitative evaluations of CCT programs (Adato, 2000; Adato et al, 2004). In Colombia, an independent ECD intervention specifically targeted the "madre voluntarias" of the CCT program in recognition of their local leadership role (Attanasio et al, 2015).

significantly higher investments in both education and nutrition of their children. Random exposure to successful leaders also led to significant shifts in parental aspirations and expectations for their children's.[4]

We use a two-stage randomized design to identify the social interaction effects. The program combined a regular CCT with interventions aimed at increasing households' productive potential. Because it targeted the vast majority of households in each community and explicitly encouraged group formation, it is a good setting to analyze the role of social interactions. The experiment varied the nature and the size of the benefit packages leaders and other households received, and as such creates random variation in whether beneficiaries live close to leaders that received the largest package. In general all leaders have higher human capital investments and aspirations than other beneficiaries, and hence provide potential examples to follow. The leaders that received the largest package, in addition, outperform other leaders in terms of economic outcomes and also have higher expectations for their children's future. Earlier findings also showed that leaders with the largest package communicated more with other beneficiaries during the intervention.[5] We analyze whether proximity to these successful and motivated leaders affected human capital investments of other beneficiaries.

We follow Manski (2000) and define social interactions as interactions with agents – in this case leaders with the largest package – that affect actions of other agents through changing constraints, expectations or preferences. We provide empirical evidence in support of those different channels, by exploiting the random variation in the type of package each of the non-leaders received and the variation in per capita expenditure levels that resulted two years after the intervention. Beneficiaries of the largest package - on average - still

[4] We draw on a rich set of questions measuring parental expectations and aspirations. As in Beaman et al (2012) and Bernard et al (2014) we measure aspirations by asking parents about what they like their children to achieve on a number of dimensions, such as the desired education level or occupation. As in the later paper, we also separately measure expectations by asking parents what they think their children realistically will achieve on those same dimensions. Both set of indicators more broadly capture future oriented attitudes.

[5] More specifically, distance between houses generally reduces communication between leaders and beneficiaries (as expected), but this was not the case for leaders with the largest package. The differences between leaders with different packages were significant (Macours and Vakis, 2014).

had higher per capita expenditures two years after the end of the transfers, and more so when they were exposed to leaders with the same package. Such effects do not exist for beneficiaries of the other packages. Hence while changes for the first group can be driven in part by relaxing spending constraints, changes for the other groups are more likely driven by shifts in expectations or aspirations (and hence preferences).

The paper contributes to the developing literature in economics and the wider social sciences on the role and the formation of aspirations (Genicot and Ray, 2014; Besley, 2016). Appadurai (2004) and Ray (2006) argue that upward mobility might be difficult for the poor when they lack the capacity to aspire, i.e. when their own experiences and the experiences of those that are close to them suggest that escaping poverty is not a feasible option. Yet learning about the positive experiences of others that are sufficiently "close" may help open their "aspiration window". Hence social interactions may be instrumental in changing aspirations and shaping positive attitudes towards the future, and in turn lead to investments in children's future.[6] Empirical evidence of such mechanisms is rare due to the "reflection problem." This paper addresses the problem through the randomized assignment of leaders and other beneficiaries to different benefit packages.

More broadly, this paper relates to recent work on the potential of social interactions to shift norms and behavior (Paluck and Shepherd, 2012; Feigenberg, Field, and Pande, 2013) and to the emerging literature about mental models and attitudinal changes (Jensen and Oster 2009; La Ferrara, Chong, and Duryea 2012; World Bank, 2015; Hoff and Stiglitz, 2016). By focusing on local female leaders, the paper also relates to the literature on female reservations for local leadership position in India (Chattopadhyay and Duflo, 2004; Beaman et al, 2009) and in particular to Beaman et al (2012), who show that a law reserving leadership positions for women affected girls' educational aspirations.

Finally, this study relates to the growing literature on longer-term impacts of CCT programs (see Molina-

[6] Appadurai (2004) describes how mobilization by social movements can expand the capacity to aspire, in part through regular social gatherings and sharing ideas and experiences about future-oriented activities among the poor.

Millan et al, 2016, for a review). We contribute by studying the impacts of a one-year randomized pilot program after it ended, and for which the experimental control group was never phased in. This allows providing clean evidence of the sustainability of impacts on human capital investments after only a few years, avoiding selection (attrition) concerns that often hamper long-term studies. That said, because the intervention only lasted one year, it differs from many of the large CCT programs in Latin America, where beneficiaries often receive transfers for many years.[7] We return to this point in the conclusion. By focusing on the impact on human capital investment, we complement other studies that analyze whether the impacts on human capital outcomes (as opposed to investments) or other welfare outcomes persist on the longer run. While some studies analyze long-term impacts of ongoing programs (Parker, Behrman and Todd, 2009, 2011; Gertler, Martinez, and Rubino-Codina, 2012; Araujo, Bosch and Schady, 2016), others, like us, provide evidence on programs with short duration (Barham, Macours, and Maluccio, 2013a,b; Macours, Premand and Vakis, 2013; Barrera-Osorio, Linden and Saavedra 2015; Filmer and Schady, 2015).

The paper is organized as follows: in the next section we discuss the program and the relevance of social interactions. Section 3 discusses the data and the empirical strategy. Section 4 shows that social interactions with successful leaders had persistent impacts on other beneficiaries' human capital investments. Section 5 shows results for per capita expenditures, parental expectations and aspirations; section 6 concludes.

2. Program information and design

2.1. Program description and treatment packages[8]

The *Atención a Crisis* program was a one-year pilot program implemented in 2006 by the Ministry of the Family in Nicaragua. In the treatment communities, three different treatments were randomly allocated among

[7] In the large national CCT programs in Colombia or Mexico, for instance, beneficiaries only exit when their children reach a certain age or after households reach a higher income level.

[8] More details about the program are provided in the online appendices of Macours, Schady and Vakis (2012) and Macours and Vakis (2014), as well as the following website: http://go.worldbank.org/VUYJAQ3UN0

3000 eligible households. All selected households were eligible for the basic CCT, which included cash transfers conditional on children's primary school attendance and health center visits. The transfers came with a strong social marketing message reinforcing the importance of investing in children's education and in a diversified diet. Take-up of the CCT was 95%. In addition to the CCT, one-third of the eligible households received a scholarship for a vocational training for one adult (with take-up of 89%). Another third of eligible households received, in addition to the basic CCT, a 200 US$ lump-sum grant to invest in a small non-agricultural business (with take-up of 99%). This last treatment was perceived by the beneficiaries as the most attractive, and involved the largest cash amount. We call it the "largest package". Given the high take-up rates, we henceforth refer to eligible households in treatment communities as beneficiaries.

The program design aimed to change households' investment behavior through several mechanisms. The level of cash transfers was substantial, ranging from 18 per cent of average annual household income for those receiving the basic CCT package to 34 per cent for those receiving the productive investment package. The conditionalities and social marketing on education, health and nutrition aimed at changing households' perspectives about investment in long-term human capital. The program design also created many opportunities for enhanced communication between beneficiaries. More than 90 per cent of the households in treatment communities were eligible for the program, increasing the opportunities for information sharing, possibly resulting in higher motivation and program ownership. Beneficiaries were also required to participate in local events ranging from discussions on nutrition and health practices to workshops on the importance of education, business development and labor market skills. The program put in place a system of volunteer local *promotoras* to enhance information flows and compliance with program requirements. The *promotoras* met frequently with small groups of beneficiary women to talk about these requirements and the program's objectives. As such, the program created a lot of new leadership positions for women.[9] Women self-selected into these positions and then subsequently were randomly allocated to one of the three program packages (see

[9] Before the program, leadership positions for women were limited mostly to positions as teachers and health coordinators.

below). Interviews during and after the intervention showed that most of the *promotoras* had taken strong ownership of the messages and objectives of the program, and were committed to reminding other beneficiaries that the purpose of the cash transfers was to invest in the nutrition and education of their children. During payment days, for instance, *promotoras* would often organize with the beneficiaries in their group to collectively buy food products and material for their children. Among other things, this allowed beneficiaries to directly observe investments by their *promotoras.* Qualitative evidence further confirms that beneficiaries were very aware of investments by others, with plenty of stories about children in the village going to school well fed, with new cloths and material.

2.2. Program randomization

The program targeted 6 municipalities in the Northwest of Nicaragua, and a first lottery randomly selected 56 intervention and 50 control communities. Baseline data were used to define household program eligibility using proxy means methods for both treatment and control.[10] In the treatment communities, the main female caregiver from each eligible household was invited to a registration assembly. If there were more than 30 eligible households in a community, several assemblies were organized at the same time, and households were assigned to one of the assemblies based on the geographic location of their house. In total, there were 134 assemblies (hence on average 2.4 per community).

During the assemblies, the program objectives and its various components were explained and women were asked to volunteer for the *promotora* positions. Volunteers were approved by the assembly and each *promotora* became responsible for a group of approximately 10 beneficiaries living close to her, with *promotoras* and beneficiaries mutually agreeing on the compositions of the group. After the groups were formed, and at the very end of each assembly, all the beneficiaries - including the *promotoras* - participated in

[10] As more than 90% of all households were eligible, the analysis in this paper is limited to the eligible households.

a second lottery process through which the three packages described above were randomly allocated among the beneficiaries, with each of the three packages assigned to one-third of households in the treatment communities. As a result of the two lotteries, households were randomly assigned to the control group (in the control communities), or to one of three packages: the CCT, the CCT plus training, or the CCT plus productive investment grant (the largest package). Since *promotoras* and existing female leaders in the treatment communities were randomly allocated to one of the three treatment groups, beneficiary households were randomly exposed to leaders with a treatment package that could be different from theirs. In particular, as there are on average four leaders in each assembly, some beneficiaries will randomly live close to several leaders that got the largest package, while others may not have any leaders with that package in their registration assembly.[11] This is the main exogenous variation that we exploit.

3. Data and empirical strategy

3.1. Data

In treatment communities, data were collected from all households. In control communities, a random sample of households was selected at baseline so that the control group was of equal size as each of the three intervention groups (1000 households). The data analyzed in this paper was collected between August 2008 and May 2009, approximately two years after the last transfer. Individuals who had migrated out of the area were tracked to different locations in Nicaragua resulting in a very low attrition rate (3 per cent at the household level), which is uncorrelated with treatment.

The survey instrument was modeled after the Nicaraguan Living Standard Measurement Survey (LSMS),

[11] While the meetings of the *promotoras* with their groups were, by design, more frequent than meetings with the larger group of beneficiaries of an assembly, we use the larger assemblies as the reference group in part because the administrative information on the composition of the small groups is less precise than the information on who participated in which assemblies. In addition, it is possible that beneficiaries reorganized the groups after the assemblies, so that the effective groups may not correspond to the administrative data on groups.

with modules on education, health, and detailed household expenditures, among others. For the main set of results, we use the same education and nutrition investment indicators as those used in Macours and Vakis (2014). Specifically, for child level education outcomes, we consider all children between 7 and 18 years old, and use an indicator of whether the child was attending school, the number of days the child has been absent from school in the last month, and the amount spent on school expenditures since the start of the academic year. Nutrition investment is measured at the household level and is measured by the shares of food expenditures for animal products and for vegetables and fruits, reflecting the emphasis of the program's messaging on the importance of such nutrients for children. To account for multiple hypotheses testing, we also combine the education and nutrition variables in two aggregate indices, by first calculating z-scores for each variable using the mean and standard deviation of the control group, and then averaging over these z-scores, following Kling, Liebman and Katz (2007).

We complement this analysis with indicators of investments in children 0-7 years old, using the same indicators of investment in early childhood as Macours, Schady and Vakis (2012). We analyze impacts on three families of outcomes by calculating average z-scores of a set of indicators for nutrition, education and health.[12] These are the three early childhood risk factors for which investments on average were still higher in the treatment than in the control, two years after the end of the transfers. As this is an age group that is not yet in primary school, the stimulation index can be seen as the equivalent of the education index for the older children. We use these indices to specifically analyze social multiplier effects on investment in children born after the end of the transfer (and hence approximately 0-2 years old). This allows testing whether the change in investment behavior is also observed for children not directly affected by the intervention, which provides a strong test of a more permanent shift in investment behavior.

[12] The nutrition index is the average of the z-scores for the share of food in total expenditures, the shares of animal proteins and of fruit and vegetables in total food expenditures, and the reverse of the share of staples in total food expenditures; the stimulation index is the average of the z-scores for variables indicating whether the household has pen and paper, has a toy, somebody tells stories or sings to the child, and the number of hours reading to the child per week; and the health index is the average of the z-scores for variables indicating whether the child was weighed, got vitamins or iron, got deworming drugs, and the number of days sick in bed. See Macours, Schady and Vakis (2012) for detailed definitions.

A specific module was added in 2008 to ask mothers' about expectations and aspirations for all their children between 7 and 15 years old.[13] Mothers were asked both what they desired (to measure aspirations), and what they realistically expected for their children in terms of final educational attainment, occupation, future monthly earnings, and living standards. To proxy for future living standards, we also ask mothers for the number of rooms they desired and expected for the house their children would live in in 30 years time. For occupation, we consider two possible definitions. The first is a dummy indicating whether the mother expected or desired a professional job for her child, i.e. a job for which university education is required. The second is a dummy indicating whether she expected or desired a professional or skilled salary job, i.e. a job for which at least secondary education would be required. For monthly earnings, and taking into account the highly skewed nature of the distribution of this variable, we follow Athey and Imbens (2016) and use an indicator of the rank in the earnings distribution.[14] Finally, to account for multiple hypotheses testing, we use an aggregate indicator for both aspirations and expectations, which is the average of the standardized measures for educational attainment, occupation, monthly earnings and living standard (number of rooms in the house), following Kling, Liebman and Katz (2007).[15] All standardized measures were obtained by subtracting the mean and dividing by the standard deviation of the control group.

3.2. Outcomes for leaders

Identification relies on the random allocation of beneficiaries to one of the three program packages or the control, and the random allocation of these same packages among leaders. We consider both the leadership positions created in the treatment communities by the program (the *promotoras)* and other women with leadership positions, since they are not mutually exclusive (many health coordinators and teachers

[13] The module was not asked for children younger than 7, as mothers demonstrated difficulties answering such questions for their young children during piloting.

[14] Results are qualitative similar when using the absolute value of earnings, winsorized at 95th percentile.

[15] As an important share of parents desire professional jobs for their children, but few expect their children to get such jobs, we use the variable for professional job in the aggregate index for aspirations, and the variable for professional or skilled wage job in the aggregate index for expectations.

volunteered to be *promotoras*). Female leaders tend to be younger and more educated than the average female beneficiary. While beneficiaries on average have completed 3 years of education, leaders have completed on average 5 years. Other indicators of socio-economic status at baseline are similar between leaders and non-leaders.

In Macours and Vakis (2014) we show that the randomization worked well and that the short-term returns to the largest package for the leaders were higher than for the other beneficiaries. During the intervention, leaders with the largest package also had higher non-agricultural and total income than leaders with other packages, reflecting the additional cash they had received to start new activities. As the income level and the income sources of these leaders at baseline were similar to those of the other beneficiaries, it seems plausible that beneficiaries could identify with their success during the program and that this might have motivated and inspired them.

The largest package is also the only intervention that led to gains in average income and consumption levels two years after the end of the program (Macours, Schady and Vakis, 2012; Macours, Premand and Vakis, 2013). Table 1 shows that leaders who received this package continue to stand out. Two years after the end of the intervention, leaders who had the largest package still have higher incomes from non-agricultural self-employment than other leaders. And their nonagricultural income and total income is significantly higher than for other beneficiaries who received the same package, even if their income from agricultural wages is lower. This suggests they may have been better in maintaining their new commercial activities and likely continue to be seen as successful leaders in the community.

We observe the same patterns with respect to parents' expectations for their children's future. For leaders who received the largest package, expectations are significantly higher than for other leaders. They expect their children to achieve higher schooling levels and earn higher wages, and are 11 percentage points more likely to expect their children to become a professional or skilled salary earner (Table 1). There are also large

differences in the expectations of these leaders and those of other beneficiaries who received the same package, with leaders expecting their children to obtain 1.5 years more education, and 21 percentage points more likely to become a professional or skilled salary earner. These latter differences are consistent with the program identifying natural leaders through self-selection. The differences mean that these leaders may be seen as local success stories – in both current achievement and their attitudes towards the future - that others could aspire to emulate.

A similar pattern is found for differences between leaders and others in their reported aspirations for their children, although differences in aspirations are smaller than differences in expectations. Comparing mean values of aspirations and expectations shows large gaps between the two sets of outcomes, with expectations for educational attainment, for instance, 5 years less than aspirations and similarly large differences for earnings, occupation and living standards. Interestingly, these gaps are smaller for leaders than non-leaders. The pattern suggests that both leaders and other households internalize their constraints when reporting their expectations, but they also suggest a capacity to aspire to a much better lives for their children.[16]

In line with the other results, leaders' investments in the education and nutrition of their children are higher than those of others beneficiaries. The significant differences in human capital investment between leaders and non-leaders in Table 1 mirror similar findings from the baseline and the midline survey (Macours and Vakis, 2014). Leaders with the largest package hence provided positive examples for others, in line with the program objectives, both during the program and two years after the transfers ended.

3.3. Empirical specification

To analyze whether higher exposure to leaders with the largest package changed education and nutrition investments of other beneficiaries, we calculate the share of leaders randomly allocated to the largest package

[16] The questions for expectations specifically asked: "Taking into account your current situation, what do you expect… "

in each registration assembly, including – as before – both *promotoras* and other women with leadership positions in the community. The average number of leaders in an assembly is four, so that there is substantial variation in the share of leaders that got the largest package in an assembly. There is much less variation in the share of other beneficiaries who got the largest package since the number of households in each assembly was relatively large and thus the share of non-leaders with the largest package in each assembly is close to one-third in all assemblies.[17]

Our general specification is:

$$Y_{ia} = \delta_0 + \delta_1 T_{ia} + \delta_2 (T_{ia} * S_a) + \delta_3 S_a + \varepsilon_{ia} \quad (1)$$

where Y_{ia} is an outcome indicator for eligible household i (or a child of household i) who was invited to assembly a, T_{ia} is assignment of i to any of the three treatment groups, and S_a is the share of leaders in the assembly that randomly received the largest package in i's registration assembly. Given that households were invited to particular assemblies based on geographic proximity, S_a will capture the share of leaders with the largest package that live in the proximity of i.[18] Since S_a is always 0 in the control communities, and since all eligible households in the treatment communities receive one of the three intervention packages, the term $\delta_3 S_a$ cancels out of the estimation. The coefficients of interest are δ_1 and δ_2. A finding, for example, that δ_1 and δ_2 are both positive would imply that while assignment to the treatment group increases the outcome of interest (δ_1), there is an additional impact of the program that comes from the social interactions (δ_2). We also explore how the share of leaders with the largest package affects impacts for beneficiaries of each of the three

[17] The share of peers at the 10th and 90% percentile of the distribution is 21 and 39% respectively. In contrast for the leaders, the shares at the 10% and 90% of the distribution are 0 and 67%.

[18] Location of one's house might be endogenous, and people living in the proximity of leaders might also be more likely to be their family members, or otherwise have similar characteristics. The identification in this paper does not depend, however, on the proximity to the leader per se, but instead it depends on the random allocation of certain packages to those leaders.

packages separately. All regressions are estimated on the sample of eligible households (or their children) that are not leaders themselves.

4. Social interaction effects on human capital investments

4.1 Main results

We first pool households across treatment packages and investigate whether there is a general relationship between program impacts and proximity to leaders who received the largest package. Table 2 presents in the top panel the results for 2008, the main focus of this paper, and in the bottom panel, the findings for 2006 from our earlier work for comparison. The interaction terms in the top panel suggest that social interactions are crucial to sustain program impacts on education and nutrition investments after the end of the intervention. Indeed, the findings indicate no significant sustained impacts on human capital investments when no leader was assigned the largest package, in contrast to the findings during program implementation.

The interaction terms suggest that the higher the share of leaders with the largest package, the less likely children are absent in school and the more households invest in education, in animal proteins and in fruit and vegetables. The social multiplier effects are not only statistically significant but also large. For example, school expenditures increase 49% when all the leaders in one's assembly got the largest package, while school absences decline by 21%. Strikingly, the magnitude of the social multiplier effects two years after the end of the program are similar, if not larger, than those while the intervention was in place. The coefficients of the z-scores in Table 2 also imply that, two years after the transfers, the impact on nutrition, respectively educational, investment was only significantly different from zero if at least 33%, respectively 75%, of leaders in one's registration assembly received the largest package.

Table 3 shows the social interaction impacts on human capital investments by treatment group. The effects are strongest for beneficiaries of the largest package. For instance, school expenditures more than double for beneficiaries of the largest package in the extreme case that the share of female leaders with the same package changes from 0 to 1. The impacts are about half the size for the beneficiaries of the training packages (and even smaller for those with the basic package) for most outcomes and the interaction effects for education investments are not significant. Nevertheless, as for the 2006 findings, the p-values indicate that we cannot reject that the social effects are the same for the three groups for most variables. And when pooling the basic and the training packages, the interaction effects for school expenditures, the nutrition-index, expenditures for animal proteins, and fruit and vegetables are all significant (not shown).

Note that while the coefficients of the interaction effects are large, there are on average about 4 leaders in a registration assembly. The estimates hence indicate that having one additional leader with the largest package in one's assembly reduces school absences by 0.4 days per month and increases school expenditures by about 16 percent. For households that have the largest package, one additional leader with the same package increases school attendance by 2.5 percentage points and increases school expenditures by 25 percent. These are not only large effects, but are similar or even larger than the effects found in 2006. Hence, interactions with leaders had a remarkably persistent impact on other households' investment behavior, and the impact is particularly important for households that themselves received the largest package.

In contrast to the impacts during the intervention, however, none of the packages had positive impacts on investments for beneficiaries that were not exposed to any leader with the largest package, and indeed the point estimates are negative for a number of indicators. Hence positive significant effects are only found for the subset of the beneficiaries with high exposure to successful leaders.

4.2. Robustness

The results are robust to several alternative specifications.[19] A first concern could be that the results are driven by extreme values in the independent variable. While the average share of leaders with the largest package is 0.33, for 95% of the observations, the range is between 0 and 0.67. The first robustness check in Table 4 excludes observations with values above 0.67. This does not substantially alter any of the results, even if, as expected, the standard errors increase. The results are also robust to clustering the standard errors at the level of the registration assembly, as opposed to at the community-level, and to not excluding outliers. The next two specifications show that the results are further robust to controls for the total number of people in an assembly, or the total number of peers (defined as beneficiaries that are not leaders) in an assembly. Finally, the results remain generally robust when including a community fixed effect, with the exception of the food expenditures for animal products, even if the variation in the independent variable is reduced.

Table 4 also shows alternative specifications using the number of leaders with the largest package instead of the share. These specifications separately control for the total number of leaders in the registration assembly. The coefficient on the number of leaders with the largest package is consistent with the main results in terms of sign, size, and magnitude. We can then also compare the coefficient of the number of leaders with the largest package, with the coefficient of the number of peers with the largest package (last specification in Table 4). The results suggest that social interaction effects from peers might be more limited: the coefficients are generally not significant and smaller than the coefficients for the number of leaders, with the exception of the expenditures for animal products. The coefficients for leaders and peers are significantly different for school attendance, absences and spending on fruit and vegetables. Note however that these results should be interpreted with caution, given that they could be driven by the fact that there is less variation to identify the social effects of peers.

4.3. Results for investments in early childhood

[19] Table 4 presents robustness checks for the beneficiaries with the productive investment package. Results pooling all beneficiaries are similarly robust.

Table 5 shows estimates of the social multiplier effects for investments during early childhood, showing estimates for all children 0-7 years old, and separately for the cohort of children born after the end of the transfers (i.e. children approximately 0-2 years old). The results show relatively large social multiplier effects for both age groups for both nutrition and stimulation. In contrast, we do not observe a similar pattern for health investments. This result is interesting, as the health conditionalities in *Atencion a Crisis* were never monitored due to coordination problems between the ministry of health and the ministry of the family. It seems plausible that the health component was seen as less salient by leaders and less emphasized during discussions about the program. For nutrition and stimulation, the coefficients are positive and significantly different from zero for almost all beneficiaries, except those that were not exposed to any leader with the largest package. Impacts are larger for beneficiaries with higher exposure to such leaders.

Importantly, we find similar strong and significant social multiplier effects for investments in nutrition and stimulation for children born after the end of the transfers. This is true even if the statistical power is reduced as the cohort is much smaller. There are no significant differences in the coefficient of the multiplier effects for beneficiaries with different packages. Overall, these results point to a permanent shift in investment behavior among families exposed to successful leaders that goes beyond the impacts on the children that directly benefitted from the intervention.

5. Social interaction effects on per capita expenditures, expectations and aspirations

While the identification strategy allows to clearly demonstrate the importance of the social interaction effects, it does not necessarily help to understand how exactly leaders might be influencing other households' investments. Indeed one can wonder whether interaction with leaders with the largest package may have lifted economic constraints of other households, whether the interaction effects are driven by other households mimicking the behavior of these leaders, or whether they capture actual shifts in aspirations and expectations of non-leader households for the future of their children.

We investigate this question by analyzing the data regarding mothers' expectations and aspirations for children's final educational levels, future occupation, earnings and living standards. Table 6 shows results of the main specification for these outcomes, and also shows the spillovers on the educational level attained by 2008 and on per capita expenditures levels. These questions were only asked for children less than 15 years old as older children are more likely to already have reached their final education levels.[20] The top panel shows the impacts on the expectations mothers reported for their children, while the lower panel shows impacts on their aspirations.

Table 6 shows that parents' expectations about their children obtaining professional jobs or skilled salary jobs are strongly affected by exposure to leaders with the largest package. Having one more such leader in one's registration assembly increases expectations of parents for their children to become (white-collar) professionals by almost 50% (starting from a very low level in the control group). Strong social multiplier effects are also found for expectations regarding children's future earnings and living standards. The social interaction effects for mothers' aspirations follow a similar pattern.

Averaging over the different indicators, we find that the difference between no exposure and full exposure to leaders with the largest package increases expectations regarding children's future with 0.27 standard deviations, while it increases aspirations with 0.21 standard deviations.[21] The coefficients of the z-scores in Table 6 also imply that, two years after the transfers, the impact on expectations and aspirations was only significantly different from zero if at least 60% of leaders in one's registration assembly received the largest package. Overall, these findings show that interactions with successful female leaders changed beneficiaries'

[20] In an alternative specification, we excluded children below 9 years old from the analysis, as the younger children did not directly benefit from the educational component of the CCT during the intervention. Results are broadly similar, but social multipliers on expected years of education, attained years of education, and expected earnings are slightly larger for the beneficiaries of the largest package.

[21] Increases in aspirations (expectations) reflect a change towards more ambitious aspirations (expectations).

expectations and aspirations for their children's educational and occupational future, consistent with the sustained higher levels of human capital investments.

The table further shows that the large spillover effects in investments are reflected in spillovers in educational attainment by 2008. Indeed 2 years after the end of the intervention, being exposed to one additional leader with the largest package increases children's school attainment with 0.18 years of schooling. A comparison of this coefficient with the estimate on expectations suggests that parents expect the educational gains to persist and possibly slightly increase in the future. The estimates also imply, however, that the one-year CCT program did not significantly increase educational attainment for more than half of the children in the sample. Finally the table shows that there is no significant social multiplier for per capita expenditures.

To further understand the potential role of relaxing economic constraints, Table 7 shows social multiplier effects separately for each of the three types of beneficiaries. The last column in Table 7A shows a significant social multiplier effect on per capita expenditures for households who got the largest package, but no such effects exist for the two other packages. Hence beneficiaries who got the largest package are still better off two years after the intervention when a sufficiently large share of leaders in their proximity received the same package. This result is in line with findings on similar spillovers for productive investments during the intervention (Macours and Vakis, 2014). In contrast, the coefficients of the interaction effects of per capita expenditures for beneficiaries with the basic and training package are very small, not significantly different from zero, and significantly different from the interaction effect for the largest package. Hence for the two other groups, economic spillovers cannot explain the change in education and nutrition investment. [22]

Considering then the impacts on expectations (Table 7A), we see that social multiplier effects are significant for all three interventions, and are not significantly different from each other. Hence beneficiaries of the three

[22] One could have thought such economic spillovers could arrive from leaders employing other beneficiaries in their new business, or otherwise transferring economic benefits from their increased income to other beneficiaries.

packages expect a better future for their children, as long as they have sufficiently high exposure to leaders with the largest package. This is so even if only beneficiaries with the largest package are economically better off two years after the interventions. This mirrors the findings for investments, where we also found no significant differences between groups, even if the point estimates are higher for beneficiaries of the largest package. Hence the social multiplier effects do not just come from changes in economic constraints, as expectations and investments change also for the groups for whom economic constraints were not relaxed.

The results on aspirations (Table 7B) complete the picture, as the social multiplier effects for aspirations are concentrated on beneficiaries who received the training package (and to a lesser extent those with the basic package). Possibly, for beneficiaries of the productive package, their own experience of trying to develop a non-agricultural activity may have dampened the impact of leader's experiences on aspirations, in particular given that average aspiration levels were already high. One could also hypothesize that the focus of this package on non-agricultural self-employment led these beneficiaries to put less weight on professional occupations or high levels of education for their children. In contrast, the results for beneficiaries of the training package are driven in particular by the aspirations for education and professional occupation, which may suggest training led to a higher orientation towards education.[23] Yet the results show these increased aspirations only materialized if they were exposed to a large share of leaders with the largest package. Indeed there even is a significant negative impact on aspirations if none of the leaders in their proximity got the largest package, suggesting that some training beneficiaries in fact got demotivated.[24]

While the differences in findings for expectations and aspirations are intriguing, they could in part be driven by measurement errors. Parents may find hypothetical questions regarding the desired future for their children

[23] The vocational training may have made beneficiaries more aware of the potential gains to formal education through a number of channels: exposure to the professional staff conducting the training, increased awareness of the benefits of skilled wage employment, or awareness of the importance of education to increase returns to other training (as illiterate beneficiaries in particular were very limited in their choice of courses).

[24] As training did not lead to significant increases in income, this does not seem implausible.

hard to answer and the difference between expectations and aspirations, while theoretically important for economists, are not necessarily accurately captured by the answers mothers gave to the respective questions. A more cautious interpretation of the results in Table 6 and 7 therefore is that there was a significant social multiplier effect on parent's attitudes regarding their children's future for the three types of beneficiaries. This attitudinal change in turn is consistent with the social multiplier effect on investment behavior, and helps explain the increased investment by beneficiaries for whom per capita expenditure levels did not increase.

Finally, one can wonder whether the results after the end of the program result because leader with the largest package are still communicating more with other beneficiaries than leaders with other packages. This does not appear to be the case as we find no significant social multiplier effects on the probability of talking to a leader, a teacher or health coordinators, two years after the intervention (not reported). This is in line with qualitative interviews after the end of the program, which suggested that some *promotoras* may have continued to meet with beneficiaries, but that this was rather limited. Nevertheless, increased communication during the program may have played a role in shifting the local social norms towards more investment in children on the short-term, which in turn may have led to persistent changes in investment behavior.

6. Conclusions

Many development interventions aim, through a variety of mechanisms, to shift the investment behavior of beneficiary households. Conditional cash transfer programs have an implicit or explicit objective to change households' attitudes and the social norms toward investment in the education, health and nutrition of their children. When programs are designed to last for only a limited period, the sustainability of the impacts might crucially depend on whether changes in investment behavior persist after the end of the program. Yet, the mechanisms through which such change can be reached and reinforced are not always clear.

This paper shows that social interactions with successful and motivated local leaders can change the way parents think about their children's future and result in sustainable changes in educational and nutritional investment. The evidence in this paper hence draws attention to the positive role local leaders can play, which contrasts with the focus in many policy discussions of the negative role of leaders through elite capture. The results suggest that natural leaders living in people's close proximity can be important vehicles for change by motivating and encouraging others and by providing examples that people aspire to follow. We find these effects when both leaders and other beneficiaries received sizable transfers and social effects are particularly large when leaders and beneficiaries received the same package. Hence the results do not suggest that interventions should be primarily targeted to leaders. Instead, it points to the importance of assuring that development program designs take into account the presence of local natural leaders, and enhance their ownership of a program's objectives to help shift beneficiaries' attitudes.

The results also have implications for the debate on the sustainability of using cash or asset transfer programs in low- and middle-income countries. The evidence in this paper suggests that designing such programs in ways that facilitate and encourage social interactions may be important to create sustainable change. An important caveat for the interpretation of the findings is that we provide evidence of program persistence for a pilot program that only lasted one year. As such it differs from many other CCT programs in Latin America, where beneficiaries often receive transfers for many years. This could have implications for the external validity of the findings, as households do not necessarily react similarly to a one-year transitory shock than to a longer-term transfer program. The paper hence should primarily be seen as a proof-of-concept for the role local leaders can play in sustainably shifting poor households' educational and nutritional investments. More generally, the findings highlight the potential importance for careful attention to social dynamics in the design and implementation of programs targeting human capital investments.

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Table 1: Comparison of follow-up outcomes of leaders with largest package with other leaders and non-leaders

	Leader T1	Leader T2	Leader T3	Non-leader T3	P-value Leaders T3-T1	P-value Leaders T3-T2	P-value Leaders T3-NonleaderT3
Economic activities (in cordoba per capita)							
Income from non-agricultural self-employment	489.1	546	810	557	0.04**	0.09*	0.04**
Income from commercial activities	190.9	156	404	222	0.05**	0.02**	0.05**
Income from agricultural wages	602.8	749	679	973	0.51	0.55	0.01**
Value animal stock	1630	2104	2191	1631	0.14	0.84	0.13
Total income	11707	12049	12272	10925	0.51	0.78	0.05*
Expectations for children's future							
average index	0.15	0.17	0.37	0.00	0.01***	0.02**	0.00***
expected years of education attained	9.72	9.82	10.39	8.64	0.06*	0.07*	0.00***
expected occupation: professional	0.03	0.04	0.04	0.05	0.43	0.77	0.90
expected occupation: professional or skilled empl.	0.35	0.36	0.47	0.26	0.04**	0.06*	0.00***
expected number of rooms in house	2.64	2.76	2.87	2.74	0.05*	0.40	0.28
expected monthly earnings	2132	2047	2332	1976	0.12	0.02**	0.00***
expected monthly earnings (winsorized 95%)	1703	1637	1898	1593	0.13	0.04**	0.00***
Aspirations for children's future							
average index	0.06	0.19	0.17	0.02	0.15	0.83	0.06*
desired years of education attained	14.05	14.39	14.49	13.56	0.12	0.78	0.00***
desired occupation: professional	0.53	0.63	0.60	0.53	0.13	0.62	0.16
desired occupation: professional or skilled empl.	0.90	0.94	0.92	0.88	0.49	0.56	0.09*
desired number of rooms in house	5.18	5.35	5.221	5.25	0.83	0.49	0.88
desired monthly earnings : rank	2140	2239	2273	2037	0.30	0.79	0.06*
desired monthly earnings (winsorized 95%)	4532	4655	4831	4274	0.38	0.64	0.10*
Human capital investment							
Attending school	0.863	0.84	0.82	0.77	0.49	0.96	0.00***
Number of days absent from school	4.329	5.16	5.71	6.35	0.44	0.70	0.02**
School expenditures	767	683	636	518	0.51	0.67	0.00***
Share of food expenditures for animal products	0.17	0.17	0.18	0.16	0.37	0.97	0.07*
Share of food expenditures for vegetables&fruit	0.07	0.07	0.08	0.07	0.47	0.51	0.16

Note: Sample includes intent-to-treat households in treatment communities. Economic outcomes and food expenditures are household level data. Data on education, expectations and aspirations are child-level data. Highest and lowest .5% outliers of income and expenditures data trimmed. Expectation and aspirations questions refer to children 9-15 years old. Education questions refer to children 7-18 years old. Average expectation index is average of standardized outcomes for expected years of education, professional or skilled employment, number of rooms in the house and monthly earnings rank. Average aspiration index is average of standardized outcomes for expected years of education, professional employment, number of rooms in the house and monthly earnings rank. Earnings ranks are calculated by converting the absolute monthly earnings to the rank in the earnings distribution, combining answers of leaders and non-leaders. All monetary values are in Cordoba (1 US$ =~ 20 Cordobas). P-values account for clustering at the community level. *** p<0.01, ** p<0.05, * p<0.1

Table 2: Social interaction effects on human capital investments

	Education				**Nutrition**		
	Z-score education investment	Attending school (7-18 year olds)	Number of days absent from school (7-18 year olds)	School expenditures (7-18 year olds)	**Z-score nutrition investment**	Share of food expenditures for animal products	Share of food expenditures for fruit and vegetables
	2008 (2 years after program ended)						
Intent-to-treat*	**0.116****	0.045	-1.506*	310.9***	**0.353*****	0.039**	0.022***
% leaders with largest package	**(0.050)**	(0.040)	(0.88)	(118)	**(0.12)**	(0.017)	(0.008)
Intent-to-treat	**-0.031**	-0.008	0.197	-68.80	**-0.013**	-0.005	0.001
	(0.027)	(0.026)	(0.58)	(62.5)	**(0.066)**	(0.010)	(0.004)
Mean dep. variable in control	**0.001**	0.777	6.341	493.4	**-0.002**	0.154	0.0581
Observations	**5231**	5228	5228	5205	**3230**	3214	3214
	2006 (during implementation)						
Intent-to-treat*	**0.127****	0.062*	-1.760***	191.7***	**0.201****	0.022	0.014**
% leaders with largest package	**(0.054)**	(0.032)	(0.669)	(70.9)	**(0.093)**	(0.017)	(0.006)
Intent-to-treat	**0.134*****	0.050***	-1.352***	188.6***	**0.381*****	0.055***	0.019***
	(0.028)	(0.019)	(0.405)	(34.8)	**(0.058)**	(0.010)	(0.004)
Mean dep. variable in control	**0.001**	0.761	6.209	300.9	**-0.003**	0.152	0.066
Observations	**5181**	5176	5169	5153	**3294**	3278	3279

Note: Coefficients for index of family of outcomes calculated following Kling, et al. (2007). The share of leaders measures the share of female leaders with the productive investment package over all female leaders in a beneficiary's registration assembly. Individual level data for education, household level data for food expenditures. Excluding households with female leaders. Intent-to-treat estimators. Highest and lowest .5% of outliers in expenditures trimmed. Robust standard errors in parentheses, corrected for clustering at the community level. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Social interaction effects on human capital investments by intervention group

	Education				**Nutrition**		
	Z-score education investment	Attending school (7-18 year olds)	Number of days absent from school (7-18 year olds)	School expenditures (7-18 year olds)	**Z-score nutrition investment**	Share of food expenditures for animal products	Share of food expenditures for fruit and vegetables
	2008 (2 years after program ended)						
Productive investment package*	**0.188****	0.093*	-2.676**	485.4**	**0.498*****	0.050**	0.034***
% leaders with largest package	**(0.091)**	(0.050)	(1.09)	(200)	**(0.13)**	(0.019)	(0.011)
Training package*	**0.096**	0.029	-1.017	246.2	**0.364****	0.038*	0.023**
% leaders with largest package	**(0.071)**	(0.061)	(1.38)	(165)	**(0.15)**	(0.021)	(0.011)
Basic package*	**0.062**	-0.001	-0.538	192.8	**0.222**	0.032	0.011
% leaders with largest package	**(0.060)**	(0.053)	(1.15)	(154)	**(0.15)**	(0.020)	(0.012)
Productive investment package	**-0.050**	-0.034	0.764	-114.0	**-0.022**	-0.004	-0.001
	(0.032)	(0.032)	(0.69)	(72.0)	**(0.062)**	(0.001)	-0.005
Training package	**-0.014**	0.007	-0.041	-36.92	**-0.072**	-0.012	-0.002
	(0.034)	(0.030)	(0.69)	(77.2)	**(0.082)**	(0.013)	-0.006
Basic package	**-0.024**	0.011	-0.299	-46.06	**0.051**	0.001	0.005
	(0.029)	(0.031)	(0.69)	(69.4)	**(0.079)**	(0.011)	-0.005
P-value test social effect on T3 vs T2	**0.413**	0.360	0.291	0.348	**0.350**	0.575	0.373
P-value test social effect on T3 vs T1	**0.196**	0.109	0.116	0.193	**0.035****	0.252	0.069*
P-value test social effect on T1 vs T2	**0.668**	0.671	0.744	0.779	**0.350**	0.743	0.350
Mean dependent variable in control	**0.001**	0.777	6.341	493.4	**-0.002**	0.154	0.0581
Observations	**5231**	5228	5228	5205	**3230**	3214	3214
	2006 (during implementation)						
Productive investment package*	**0.192****	0.097**	-2.579***	291.6***	**0.328****	0.044**	0.019*
% leaders with largest package	**(0.076)**	(0.047)	(0.975)	(102.5)	**(0.13)**	(0.019)	(0.011)
Training package*	**0.097**	0.047	-1.356	145.6*	**0.139**	0.017	0.008
% leaders with largest package	**(0.066)**	(0.041)	(0.844)	(81.9)	**(0.11)**	(0.021)	(0.007)
Basic package*	**0.102**	0.045	-1.293	149.3*	**0.158**	0.006	0.016
% leaders with largest package	**(0.062)**	(0.052)	(1.128)	(82.8)	**(0.13)**	(0.021)	(0.010)
Productive investment package	**0.129*****	0.045**	-1.107**	174.3***	**0.368*****	0.049***	0.020***
	(0.031)	(0.022)	(0.458)	(39.5)	**(0.067)**	(0.011)	(0.005)
Training package	**0.125*****	0.049**	-1.438***	181.4***	**0.379*****	0.057***	0.018***
	(0.032)	(0.023)	(0.479)	(39.4)	**(0.059)**	(0.011)	(0.004)
Basic package	**0.149*****	0.057**	-1.574***	211.8***	**0.393*****	0.058***	0.020***
	(0.033)	(0.026)	(0.584)	(42.2)	**(0.070)**	(0.011)	(0.005)
P-value test social effect on T3 vs T2	**0.226**	0.434	0.360	0.151	**0.170**	0.174	0.327
P-value test social effect on T3 vs T1	**0.192**	0.306	0.238	0.124	**0.208**	0.0325**	0.810
P-value test social effect on T1 vs T2	**0.934**	0.964	0.959	0.964	**0.889**	0.603	0.518
Mean dependent variable in control	**0.001**	0.761	6.209	300.9	**-0.003**	0.152	0.066
Observations	**5181**	5176	5169	5153	**3294**	3278	3279

Note: Coefficients for index of family of outcomes calculated following Kling, et al. (2007). The share of leaders measures the share of female leaders with the productive investment package over all female leaders in a beneficiary's registration assembly. Individual level data for education, household level data for food expenditures. Excluding households with female leaders. Intent-to-treat estimators. Highest and lowest .5% of outliers in expenditures trimmed. Robust standard errors in parentheses, corrected for clustering at the community level. *** p<0.01, ** p<0.05, * p<0.1

Table 4. Robustness checks and alternative specifications: beneficiaries of largest package two years after program

	Attending school (7-18 year olds)	Number of days absent from school (7-18 year olds)	School expenditures (7-18 year olds)	Share of food expenditures for animal products	Share of food expenditures for fruit and vegetables
Base specification	0.093*	-2.676**	485.4**	0.050**	0.034***
	(0.050)	(1.09)	(200)	(0.019)	(0.011)
Robustness checks					
Excluding extreme values independent variable	0.064	-2.087*	319.5*	0.061***	0.037***
	(0.057)	(1.25)	(186)	(0.022)	(0.012)
S.e. clustered at level of assembly	0.093	-2.676**	485.4***	0.050**	0.034***
	(0.061)	(1.29)	(177)	(0.022)	(0.010)
Not excluding outliers			726.0**	0.051**	0.040***
			(325)	(0.020)	(0.012)
Controlling for number of people in assembly	0.093*	-2.681**	485.8**	0.051***	0.034***
	(0.049)	(1.06)	(201)	(0.019)	(0.011)
Controlling for number of peers in assembly	0.095*	-2.745**	495.4**	0.051***	0.034***
	(0.048)	(1.05)	(203)	(0.019)	(0.011)
With community fixed effects	0.096*	-2.668**	350.2	0.009	0.022**
	(0.051)	(1.16)	(226)	(0.019)	(0.010)
Alternative specifications with # number of leaders					
# leaders with largest package	0.019	-0.599*	94.64**	0.013**	0.009***
controlling for total nr leaders	(0.015)	(0.33)	(47.2)	(0.005)	(0.003)
# leaders with largest package	0.033**	-0.855**	72.98	0.001	0.006**
controlling for total nr leaders and community f.e.	(0.016)	(0.36)	(53.8)	(0.005)	(0.003)
# leaders with largest package	0.031	-0.833*	100.3*	0.009	0.007**
controlling for total nr leaders	(0.019)	(0.42)	(55.2)	(0.007)	(0.003)
# peers with largest package	-0.003	0.028	32.76	0.012**	0.001
controlling for total nr peers and community f.e.	(0.020)	(0.45)	(36.9)	(0.005)	(0.003)
P-value test social effect leader = social effect peer	0.064*	0.046**	0.265	0.567	0.100*

Note: See notes table 3. Every line corresponds to a separate specification, with the exception of the last specification where the number of leaders and peers are included in the same specification. Peers are defined as all beneficiaries with the same package that are not leaders. Specification with extreme values of independent variable excluded: excludes observations for which the value of the share is in the upper 5% of the distribution.

Table 5: Social interaction effects on human capital investments in early childhood two years after program

	Children 0-7 years old			Children born after end of transfers (0-2 years old)		
z-scores	Nutrition	Stimulation	Health	Nutrition	Stimulation	Health
			2008			
Intent-to-treat*	0.323***	0.143*	0.004	0.383**	0.243**	0.087
% leaders with largest package	(0.11)	(0.078)	(0.076)	(0.18)	(0.11)	(0.089)
Intent-to-treat	-0.001	0.048	0.083**	0.067	0.033	-0.010
	(0.047)	(0.051)	(0.035)	(0.072)	(0.059)	(0.045)
Observations	3410	3405	3410	660	641	660

Note: Coefficients for index of family of outcomes calculated following Kling, et al. (2007). Nutrition index includes share of food in total expenditures, and shares of staples, animal proteins and fruit and vegetables in total food expenditures; stimulation index includes whether household has pen and paper, has toy, somebody tells stories/sings to child, and number of hours reading to child per week; and health index includes whether child was weighed, got vitamins or iron, got deworming drugs and number of days sick in bed. See Macours, Schady and Vakis (2012) for detailed definitions. The share of leaders measures the share of female leaders with the productive investment package over all female leaders in a beneficiary's registration assembly. Excluding households with female leaders. Intent-to-treat estimators. Robust standard errors in parentheses, corrected for clustering at the community level. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Social interaction effects on parental expectations and aspirations, educational attainment and per capita expenditures two years after program

	Average expectation index	Expected years of education attained	Expected occupation: professional	Expected occupation: professional or skilled empl.	Expected number of rooms in house	Expected monthly earnings: rank	Years of education attained	Log (per capita expenditures)
Intent-to-treat*	**0.267*** **	0.805	0.035**	0.137***	0.304**	315.1**	0.700***	0.126
% leaders with largest package	**(0.095)**	(0.50)	(0.017)	(0.048)	(0.12)	(147)	(0.22)	(0.096)
Intent-to-treat	**-0.052**	-0.132	0.002	-0.033	-0.032	-79.30	-0.171	0.008
	(0.056)	(0.27)	-0.008	(0.030)	(0.076)	(93.4)	(0.15)	(0.049)
Mean dependent variable in the control	**0.00**	8.41	0.023	0.25	2.62	2543	3.12	9.11
Observations	**4304**	4300	4291	4291	4299	4242	4086	3230

	Average aspiration index	Desired years of education attained	Desired occupation: professional	Desired occupation: professional or skilled empl.	Desired number of rooms in house	Desired monthly earnings: rank
Intent-to-treat*	**0.205***	0.946**	0.115*	0.028	0.146	342.2*
% leaders with largest package	**(0.10)**	(0.42)	(0.065)	(0.026)	(0.37)	(185)
Intent-to-treat	**-0.018**	-0.090	-0.015	0.015	-0.063	26.48
	(0.067)	(0.26)	(0.048)	(0.019)	(0.15)	(124)
Mean dependent variable in the control	**-0.001**	13.29	0.50	0.872	5.19	2485
Observations	**4302**	4300	4299	4299	4300	4289

Note: The share of leaders measures the share of female leaders with the productive investment package over all female leaders in a beneficiary's registration assembly. Individual level data for children 7-15 years old in 2008. Per capita expenditure measured at the household level. Excluding households with female leaders. Intent-to-treat estimators. Robust standard errors in parentheses, corrected for clustering at the community level. *** p<0.01, ** p<0.05, * p<0.1. Average expectation index is average of standardized outcomes for expected years of education, professional or skilled employment, number of rooms in the house and monthly earnings rank. Average aspiration index is average of standardized outcomes for expected years of education, professional employment, number of rooms in the house and monthly earnings rank. Earnings ranks are calculated by converting the absolute monthly earnings to the rank in the earnings distribution, combining answers of leaders and non-leaders.

Table 7a: Social interaction effects on parental expectations, educational attainment and per capita expenditures two years after program

	Average expectation index	Expected years of education attained	Expected occupation: professional	Expected occupation: professional or skilled employment	Expected number of rooms in house	Expected monthly earnings: rank	Years of education attained	Log (per capita expenditures)
Productive investment package*	**0.270****	0.658	0.105***	0.158***	0.315*	343.3	0.521	0.277***
% leaders with largest package	**(0.12)**	(0.74)	(0.036)	(0.058)	(0.17)	(207)	(0.44)	(0.083)
Training package*	**0.306****	0.991	-0.010	0.157**	0.385**	267.7	0.931***	0.070
% leaders with largest package	**(0.14)**	(0.73)	(0.028)	(0.076)	(0.16)	(223)	(0.32)	(0.10)
Basic package*	**0.220***	0.761	0.016	0.092	0.217	310.4	0.596*	0.051
% leaders with largest package	**(0.12)**	(0.53)	(0.027)	(0.070)	(0.19)	(237)	(0.35)	(0.15)
Productive investment package	**-0.055**	-0.087	-0.010	-0.041	-0.020	-112.5	-0.169	-0.010
	(0.057)	(0.28)	(0.011)	(0.033)	(0.079)	(102)	(0.18)	(0.045)
Training package	**-0.068**	-0.225	0.010	-0.036	-0.065	-87.8	-0.265	0.011
	(0.072)	(0.38)	(0.014)	(0.037)	(0.10)	(108)	(0.19)	(0.057)
Basic package	**-0.029**	-0.086	0.006	-0.021	-0.013	-22.2	-0.061	0.022
	(0.066)	(0.30)	(0.010)	(0.035)	(0.10)	(119)	(0.17)	(0.064)
P-value test social effect on T3 vs T2	**0.830**	0.737	0.004***	0.996	0.757	0.743	0.490	0.026**
P-value test social effect on T3 vs T1	**0.693**	0.863	0.088*	0.428	0.629	0.911	0.885	0.061*
P-value test social effect on T1 vs T2	**0.550**	0.725	0.527	0.476	0.452	0.899	0.430	0.860
Mean dependent variable in the control	**0.00**	8.41	0.023	0.25	2.62	2543	3.12	9.11
Observations	**4304**	4300	4291	4291	4299	4242	4086	3230

Note: The share of leaders measures the share of female leaders with the productive investment package over all female leaders in a beneficiary's registration assembly. Individual level data for children 7-15 years old in 2008. Per capita expenditure measured at the household level. Excluding households with female leaders. Intent-to-treat estimators. Robust standard errors in parentheses, corrected for clustering at the community level. *** p<0.01, ** p<0.05, * p<0.1. Average expectation index is average of standardized outcomes for expected years of education, professional or skilled employment, number of rooms in the house and monthly earnings rank. Earnings ranks are calculated by converting the absolute monthly earnings to the rank in the earnings distribution, combining answers of leaders and non-leaders.

Table 7b: Social interaction effects on parental aspirations by intervention group two years after program ended

	Average aspiration index	Desired years of education attained	Desired occupation: professional	Desired occupation: professional or skilled empl.	Desired number of rooms in house	Desired monthly earnings: rank
Productive investment package*	**-0.008**	0.338	-0.032	-0.038	-0.481	331.0
% leaders with largest package	**(0.12)**	(0.57)	(0.091)	(0.042)	(0.34)	(304)
Training package*	**0.406*** **	2.114***	0.297***	0.084**	0.378	266.3
% leaders with largest package	**(0.13)**	(0.70)	(0.097)	(0.042)	(0.24)	(236)
Basic package*	**0.233**	0.379	0.081	0.039	0.603	470.6*
% leaders with largest package	**(0.18)**	(0.52)	(0.078)	(0.046)	(0.89)	(276)
Productive investment package	**0.068**	0.169	0.039	0.034	0.163	68.1
	(0.072)	(0.29)	(0.051)	(0.023)	(0.17)	(154)
Training package	**-0.147****	-0.661*	-0.119**	-0.016	-0.300**	26.5
	(0.074)	(0.36)	(0.059)	(0.027)	(0.15)	(125)
Basic package	**0.015**	0.212	0.033	0.025	-0.087	-32.3
	(0.079)	(0.29)	(0.051)	(0.026)	(0.22)	(151)
P-value test social effect on T3 vs T2	**0.006*** **	0.027**	0.007***	0.290	0.033**	0.853
P-value test social effect on T3 vs T1	**0.206**	0.958	0.309	0.832	0.211	0.701
P-value test social effect on T1 vs T2	**0.319**	0.016**	0.017**	0.375	0.784	0.548
Mean dependent variable in the control	**-0.001**	13.29	0.50	0.872	5.19	2485
Observations	**4302**	4300	4299	4299	4300	4289

Note: The share of leaders measures the share of female leaders with the productive investment package over all female leaders in a beneficiary's registration assembly. Individual level data for children 7-15 years old in 2008. Excluding households with female leaders. Intent-to-treat estimators. Robust standard errors in parentheses, corrected for clustering at the community level. *** p<0.01, ** p<0.05, * p<0.1. Average aspiration index is average of standardized outcomes for expected years of education, professional employment, number of rooms in the house and monthly earnings rank. Earnings ranks are calculated by converting the absolute monthly earnings to the rank in the earnings distribution, combining answers of leaders and non-leaders.