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Abstract

This paper investigates the consequences of the participation in informal microfinance groups, known as Self-Help Groups (SHGs), on children's education and work in rural India. We analyze first-hand data collected from a panel of households in areas where new groups were formed in 2002. We observe these households three times over a five year period, which allows us to examine medium-term effects of SHG participation. We find a robust and strong increase in treated children's secondary school enrollment rate over time, by about 20 percentage points, to be compared with a baseline rate of 45%. This effect stems from a quicker grade progression, leading to lower drop-out rates between primary and secondary school. We find no decrease in overall child labor (but a reorientation towards part-time domestic work), indicating that there is no clear substitution between labor and education for children of secondary-school age in rural India. Contrary to what is usually believed, we show that credit does not play any direct role in the increased schooling. However, we find evidence that it partly follows from social interactions within SHGs, under the form of peer effects. Our findings indicate that microfinance groups can have large effects on the human capital of participants and their families, though such effects can take time to materialize and happen through unintended channels.

Keywords: Microfinance, Self-Help Groups, Education, Child labor, Peer effects, India.

JEL Classification Numbers: O15, G21, C33, R2

1 Introduction

Participation to a microfinance group has conflicting implications for the economic and human development of its members. A recent literature suggests that its impacts are in general ambiguous and critically depend on the context in which they take place (see Armendáriz and Morduch, 2010; Kaboski and Townsend, 2012; Duflo et al., 2015, for recent discussions). In particular, the impact of such groups on child education depends on several factors. On the one hand, an improved access to credit has different possible effects. Most obviously, it may help to bear the direct costs of education in face of liquidity constraints, or lead to an expansion of households' economic activity and income, which should increase the demand for education. Access to credit can also modify occupational patterns within the household, affecting the opportunity cost of education and the incidence of child labor in various ways (see in particular Wydick, 1999; Maldonado and Gonzalez-Vega, 2008; Shimamura and Lastarria-Cornhiel, 2010; Augsburg et al., 2015). The nature of child labor may also be affected, e.g. as children are asked to take up more household chores when their parents engage more intensively into income-earning activities (see e.g. Hazarika and Sarangi, 2008). Moreover, general equilibrium effects might cause changes in the wage structure, affecting the opportunity cost of schooling as well as the expected returns to schooling. Finally, a more flexible access to credit reduces household vulnerability to negative income shocks and economic distress and thereby lowers the incidence of school drop outs (see e.g. Jacoby and Skoufias, 1997; Jensen, 2000; Beegle et al., 2006; Demont, 2014).[1]

On the other hand, these groups typically imply a large number of other activities apart from saving and borrowing. They involve frequent, often weekly, group meetings during which members exchange about their projects, ideas or family issues. Collective activities are often organized and solidarity networks develop among their members (see for instance Casini et al., 2015). These groups also promote collective action, broader development goals and new sets of values and attitudes, that go beyond a narrow view of microfinance. An example of this are the '16 decisions' that members of the Grameen Bank have to follow, which specifically mention the obligation to help others in difficulty, take part in all social activities collectively and 'edu-

[1] Once taken out of school and integrated into the labor market, children rarely re-integrate the school system (e.g. Guarcelllo et al., 2003; Cigno and Rosati, 2005; Duryea et al., 2007). In our data, only 4% of enrolled children were not enrolled - despite being of school-age - in the previous round.

cate our children'. In the context of rural India, in which microfinance is essentially organized around so-called Self-Help Groups (SHGs)[2], group members often collectively participate in village governance, school nutrition programs and a range of other productive and social activities.[3] These broader social interactions allow group members to influence and support each other, in particular in promoting education among their children.

This paper is based on an original panel data set that we collected in three waves between 2004 and 2009 in the state of Jharkhand, one of the poorest Indian states. It studies the medium-run consequences of mothers' participation in SHGs on the secondary education and work activities of their children. Secondary education is indeed the relevant dimension to explore in this context: while primary education is almost universal, secondary school enrollment remains low, particularly in rural areas (secondary enrollment rates in Jharkhand were as low as 30% in 2004-05 DHS data).

Comparing the evolution of treated and control villages (intent-to-treat estimates), we find a strong and robust increase in treated children's secondary school enrollment rate, by about 20 percentage points (to be compared to a baseline rate of 45%). This increase happens in the last round of survey, about six years after the creation of the SHGs. This suggests that the impact of microfinance may require a long length of time before producing detectable outcomes at the household level, particularly for education decisions.[4] We find a parallel increase in days spent at school by children and in school expenses. Interestingly, we find that such effects are in fact preceded by efforts at the intensive-margin: the grade-for-age ratio of treated children indeed starts improving from round 2, about three years after the creation of the SHGs. This faster grade progression eventually leads to lower dropout rates between primary and secondary school, treated children staying longer close to the 'education frontier' than other children.

The increase in education does not come as a result of a reduction in child labor: children in SHG villages do not work less in total - even in the medium run - but tend to spend fewer hours

[2]SHGs are small groups of around fifteen women who meet weekly, save regularly and borrow collectively from commercial banks. The model of bank-linked SHGs has been promoted by the National Bank for Agriculture and Rural Development since 1992 and the Reserve Bank of India since 1999 (the original official guidelines are given by NABARD, 1992; RBI, 1999). Section 2 presents the SHG program in more details.

[3]For example, Deininger and Liu (2013a) show that SHG participation improves nutritional intake for children through SHG-related programs such as the "rice-credit line."

[4]It is important to note that SHGs' features (see below) usually imply that it takes a longer time for SHG members to access large amounts of credit compared to other forms of microfinance.

in productive activities (i.e. reorientation towards part-time work at home). That is, we find no evidence of strong substitution between education and overall child labor in this context. To the contrary, we document a positive correlation between work and enrollment, especially when it comes to household chores.

We explore a number of mechanisms that could account for these evolutions. We show that, counter-intuitively, changes in access to credit do not play any direct role. By contrast, we find that social interactions within the SHG play an important role, as enrollment rates are substantially higher for SHG members when the other members of the same SHG have children of the relevant age. This suggests the importance of social influence through role models and peer effects that take place within SHGs.

The existing empirical literature on the link between microfinance and children education is deeply mixed. Littlefield et al. (2003) review both quantitative and qualitative studies which broadly suggest a positive correlation between microfinance and child schooling (see also for instance Wydick, 1999; Maldonado and Gonzalez-Vega, 2008), even though child labor may also increase (see Wydick, 1999; Hazarika and Sarangi, 2008; Islam and Choe, 2013; Augsburg et al., 2015). By contrast, most of the randomized control trials investigating the relation conclude that microcredit has a negligible or even a negative impact on educational outcomes (see the summary of six recent RCTs by Banerjee et al. (2015); note however that positive impacts were found by Karlan and Zinman (2010) in the Philippines and Angelucci et al. (2015) in Mexico). We argue in this paper that this may be partly due to the small time span over which these experiments are evaluated. One of the very few studies of the long term impact of microcredit is Kaboski and Townsend (2012), who use a large microcredit initiative by the Thai government as a natural experiment. They find that access to microcredit had a sizable effect on consumption but left education expenditures stable, even six years after the intervention. Islam (2011) and Berhane and Gardebroek (2011) are two other studies that try to analyze longer-term effects of microfinance participation in Bangladesh and Ethiopia, respectively. Both studies show evidence of cumulative long-term effects, implying that short-term estimates may underestimate microfinance impacts.

The remaining of the paper is as follows. Section 2 briefly presents the SHG program and the education sector in India. Sections 3 and 4 present the data and our empirical strategy. We then

present our main results in section 5 and explore the improved access to credit and the social interactions within the group to explain the effects identified. Section 6 concludes.

2 Self Help Groups and Education in Jharkhand

2.1 Self Help Groups in India

We study the introduction and the development of a large microfinance program in East India, between 2002 and 2009. The program was sponsored by a large development NGO called Professional Assistance for Development Action (PRADAN). Its main objective is to promote and strengthen the livelihoods of social and economic disadvantaged communities. Central to this broad agenda is the development of the so-called Self Help Groups (SHGs). The latter represent the dominant model in Indian microfinance, which emerged in the early nineties when the Reserve Bank of India issued guidelines to all nationalized commercial banks encouraging them to lend to such groups. SHGs are the most important source of microfinance in India both in terms of outreach and total loan disbursements: by March 2013, nearly 4.5 millions SHGs had outstanding bank loans and covered about 60 millions households (Nair and Tankha, 2014). Yet, given their economic importance, relatively little research has been carried out so far on SHGs in India.[5]

PRADAN facilitates the creation of SHGs by women from relatively disadvantaged communities and poor villages in several states of India, and encourages them to become independent and develop a long-term relation with a commercial bank. (It currently runs over 10,000 SHGs.) Establishing a group usually begins with a PRADAN representative presenting the program during a public meeting in a village. A group of around 15-20 voluntary women is formed, and it progressively decides on its basic rules, such as the location of the weekly meeting, the minimum savings per member or the interest rate charged on internal loans given to group members (usu-

[5]One study in Andhra Pradesh compares newly-formed with mature groups and finds that longer-term exposure is associated with improvements in consumption and savings (Deininger and Liu, 2013b). In Orissa, SHG-members are found to better coordinate in managing common pool resources (Casini et al., 2015). In Rajasthan, Desai and Joshi (2013) randomly assigned villages to SHG exposure and find that, after two years, treated women are more likely to save, work outside of agriculture, participate in household decisions and engage in civic activities. By comparing the impact on current borrowers vis-a-vis future self-selected borrowers in several states, Bali Swain and Varghese (2009) find that longer SHGs membership has a positive impact on asset acquisition. Baland et al. (2008) explore the dynamics of group and member survival in SHGs in Orissa and Jarkhand. Demont (2014) shows how SHGs allows member households to better absorb adverse weather shocks in Jharkhand.

ally 2% monthly). The mode of organization of a SHG is therefore relatively flexible. After a period of regular savings (typically 2 years after their creation), the group can start applying for formal bank loans with a view to finance income generating activities. The group distributes the loans to its members according to their various projects, which they have to present and discuss in group meetings. At that point, SHGs are said to be *linked*, become largely autonomous, and PRADAN's support is much less frequent. Instead, the NGO then launches various livelihood programs with SHG members as well as other villagers, which involve training and support in various self-income occupations such as cotton weaving or vegetable cultivation.

While PRADAN is active in many states of India, this paper focuses on the state of Jharkhand, which was carved out of Southern Bihar in 2000. It is among the poorest of the 27 Indian states, with 41% of its rural population living below the national poverty line (World Bank, 2016). It is essentially rural (76% of its 33 million inhabitants), with a large proportion of its population tribal (26.2%) or belonging scheduled castes (12.1%), which are considered as the most vulnerable groups of the Indian society.

2.2 The education system in Jharkhand and the potential role of SHGs

The education system in Jharkhand, as in most of India, follows a 5+3+2+2 schedule. Primary school (grades 1 to 5) starts at age 6, followed by middle school (grades 6 to 8), lower secondary (grades 9 and 10) and higher secondary (grades 11 and 12). Demographic and Health Survey data from 2005-06 indicated that primary enrollment was relatively low in Jharkhand at 72% (against a national average of 83%), while secondary enrollment was substantially lower, at 26% in lower secondary and below 5% in higher secondary. Athough education is free and compulsory for children below 14 according to the Indian Constitution, school attendance involves a number of direct costs (school fees, expenditures for books, uniforms, transportation, etc.) which may be substantial, particularly among poor rural households (see Kingdon, 2005; World Bank, 2009). Transportation costs to the secondary school are also important since, while almost all villages have a primary school, secondary schools tend to be far from villages in Jharkhand.[6]

SHG membership can facilitate education by providing credit to finance the direct costs of

[6] In 2002, only 36% of villages in Jharkhand had a lower secondary school within 5km, and only 23% had a higher secondary school within 10km (World Bank, 2009).

education. In our sample, the median annual school expenses per child enrolled amounts to 480 INR in 2008, which represents 3.3% of the median household income. In secondary school, the median school expenditure per child enrolled is equal to 1,747 INR, which corresponds to 11.9% of the household median income or 35 days of work at the median wage rate. These direct costs are therefore sizable. More importantly, by encouraging income generating projects, SHGs are expected to increase household income but also to affect labor allocation within the family, with conflicting implications for education and child labor. Finally, SHGs, which are based on frequent group meetings during which women freely exchange and interact, may also play a role in terms of changing attitudes and norms or leading to female empowerment (Duflo, 2011; Mosley and Rock, 2004). This may arise through peer effects, by which a member is influenced by the behavior and the decisions made by the other members of the group.

3 Data

Our data set is based on three rounds of household surveys carried out in 2004, 2006 and 2009. We followed a stratified random sampling strategy to select 36 villages based on four geographic clusters covering the entire state of Jharkhand. We selected randomly 24 villages in which PRADAN launched its SHG program between April and June 2002, as well as 12 control villages from the same districts as the SHG villages. In each SHG village, we randomly selected 18 SHG member households, as well as 18 nonmembers. In the control villages, we selected 18 households. The full sample therefore consists in 1080 households, which were interviewed three times.

The questionnaire records detailed information about household demographics, recurrent and durable expenditures, consumption, asset ownership, credit and savings, labor market participation and self-employment, migration, food vulnerability, landholdings and agriculture, health, education, benefits from governmental programs, some measures of female empowerment and participation in village activities. All surveys were carried during the same period of the year, namely January-March, which corresponds to the pre-harvest period of the winter season. Appendix A provides the full list of villages that were surveyed, as well as basic descriptive statistics at the district and village levels. Though no difference is statistically significant, treated villages

appear to be slightly worse off than control villages, which is consistent with the NGO's targeting of administrative blocks with high incidence of rural poverty. On average, treated villages have a higher proportion of landless households, are less heterogeneous in terms of castes / tribes / religions present in the village, and tend to be more isolated. As expected because of self-selection of SHG participants, differences are more pronounced at the individual level (see table 15). On average, SHG members come more often from scheduled castes, are less likely to be landless, and are younger households with more young children, compared to other households in the same village. Yet, when pooled together, member and nonmember households are not very different from control households (except for landlessness and mother's education). All regressions will systematically control for those variables.

The overall attrition rate across rounds is relatively small, at 6.7%.[7] The vast majority (77.2%) of the households have been interviewed in all survey rounds and 11.9% have been interviewed in two rounds. More important are the changes in membership status that occurred between the surveys. These changes occur essentially due to the creation of new groups or the disappearance of some groups. Table 1 reports the percentage of members exiting and entering SHGs over time. New entries essentially arise from the creation of new groups after 2004.[8] Overall, the average rate of change in member status across rounds is 13%. In the econometric analysis, we make the conservative choice of defining members and non members according to their original membership status (see next section).

[Table 1 here.]

4 Empirical strategy

Our approach is to estimate the effect of SHGs on the village population, irrespective of households' membership (intention-to-treat estimates, or ITT), following a simple difference-in-difference strategy. We do this by comparing the average evolution of the households living in

[7] One of the reasons for this attrition is the Naxalite rebellion in the region, which prohibited us from visiting a member village for security reasons in round 3 (Kera). We replaced this village by another randomly chosen SHG village from the same district. Excluding Kera, the average attrition rate is only 5%. We will use the entire sample in our econometric estimate, but the results are fully robust to the exclusion of this particular village.

[8] Entering an existing group is relatively hard due to the size limit of the groups and the requirement that newcomers must contribute to the group an amount equal to the accumulated savings per member at that time.

SHG villages to that in the control villages in which no SHGs were created in 2002. Using data from the three survey rounds (2004, 2006 and 2009), we adopt the following baseline specification:

$$Y_{ihvt} = \alpha + \beta_1 SHG_v + \beta_2(SHG_v * R2_t) + \beta_3(SHG_v * R3_t) + C'_{it}\gamma + H'_{ht}\eta + V'_v\nu + \psi_1 S_{vt-1} + \psi_2 S_{vt-2} + \lambda_t + \delta_d + \epsilon_{ihvt} \quad (1)$$

where Y is the outcome of interest (such as school enrollment or work) for child i living in household h and village v at year t, SHG is a time-invariant dummy variable taking value one if village v is a treated village (i.e. where the SHG program was introduced in 2002) and 0 if it is a control village, $R2$ and $R3$ are round (year) dummies, C and H are vectors of control variables at the child and household levels respectively, V is a rich set of pre-treatment village-level characteristics that control for important education determinants, and λ and δ are respectively year and district or village fixed effects.[9] The village characteristics are all measured before treatment (using 2001 census data) or at baseline and include the number of households living in the village, the road access and distance to market, the proportion of scheduled-caste and landless households, the male and female literacy rates, the presence of primary and middle schools in the village and the distance to the nearest secondary school (no village of the sample has got a secondary school). In addition, given the importance of farming in the area, we always control for the standardized abundance of the monsoon (S) in the two years preceding each survey.[10] In all our estimates, we control at the household level for head's education and age, mother's education and age, scheduled caste or tribe status, official below-poverty-line status, Hinduism, the number of children below 5, the number of children between 6 and 18 and the

[9] We report both specifications in all tables. District fixed effects appropriately account for our sample stratification strategy and for the fact that districts correspond to the basic unit of Indian administration, in charge of the implementation of many development policies. With village fixed effects, the vector V as well as the variable SHG, which are fixed at the village level, are dropped from the estimation. We decided not to report the results obtained with household fixed effects, as it would exclude from the estimation all households for whom children's enrollment (or working) status does not change, in particular all households that are strongly committed to education and those who are not at all, potentially leading to biased estimates. Moreover, it would exclude households in which children exit the considered age window over the rounds. Household fixed effects are therefore not fully appropriate for our analysis.

[10] The variable is constructed as follows: $S_{vt} = \frac{Monsoon_{vt} - \overline{M}_v}{\sigma_v}$, where $\overline{M}_v$ and σ_v are respectively the historical average and standard deviation of the monsoon level in each district and are computed over a rolling window of the ten years immediately preceding the survey. Rainfall data come from the Global Precipitation Archive (Matsuura and Willmott, 2012). As shown in Demont (2014), this measure of rain shocks is strongly correlated with income levels and access to traditional credit sources in the survey villages.

number of adults in the household, and the size of landholdings. The child level controls include whether the child is the first-born in the set of all siblings and the set of same-sex siblings, her/his age and gender, and whether (s)he is the head's child. Table 15 in appendix provides descriptive statistics about all control variables.

In all our estimations, we cluster standard errors at the household level, in order to allow for heteroskedasticity and correlation of errors within households (both between children and over time). In order to adequately represent the village population from which they are drawn, observations are weighted in order to control for the different sampling probabilities between SHG and non-SHG households in treated and control villages.

The coefficients β_2 and β_3 are the main coefficients of interest and measure for each round the difference in the evolution of children in treated villages as compared to control villages. These coefficients therefore measure the average effects of the SHG intervention at the village level, taking into account that part of the population does not directly participate in the intervention (70% on average). This ITT approach has the advantage of avoiding any selection bias, and to factor in potential spillovers from member to nonmember households within villages.[11] Finally, it should be acknowledged that, because the first survey round happened about 1.5 year after the launch of the first SHGs, the ITT coefficients might slightly underestimate the effects if the groups had already produced any change by that time (though this is unlikely given the long gestation period and the delay before being linked - see section 2).

5 Results

5.1 Enrollment rates

In this section, we examine the evolution of school outcomes for children in treated households as compared to others. For child between 6 and 17 years old, our survey collected data on school enrollment, attendance, grade achieved, type and location of the school as well as school-related expenditures. We also have information about children who are temporary away from the household for study motives, e.g. on boarding schools or at relatives' place.

[11] Because of self-selection into SHGs, member and nonmember households will tend to represent different sub-samples of the village population, thus confounding the estimated effect of the treatment on the treated.

We start by describing raw enrollment rates in our sample. As explained in section 2, primary education normally starts at 6 and lasts for 5 years. Taking into account late entries and grade repetition, most students are still 11 years old in grade 5. As a result, we consider primary-school age to be between 6 and 11 and post-primary (middle and secondary) school age to be between 12 and 17. Table 2 presents the gross enrollment rates in the first and last rounds of the survey, by age categories and gender. First, we observe that enrollment rates are much larger in primary school (in round 1, 76% on average, and 80% one to two years after the normal time of entry in primary school) than afterwards (45% on average). Indeed, drop-out rates remain very low before 12 but increase substantially in secondary school, which corresponds to the end of compulsory and free education. Second, enrollment rates increase over survey rounds. In particular, post-primary school enrollment increases by 22 percentage points between round 1 and round 3, which corresponds to an increase in enrollment rates of about 50%. (The corresponding increase in primary enrollment is only 13%.) Third, enrollment rates in round 1 are generally higher in member households than in other households. Fourth, as expected, we observe higher enrollment rates for boys than for girls, but their evolution patterns are essentially similar.

[Table 2 here.]

Given the almost universal coverage of primary school, we focus on the enrollment of children aged between 12 and 17, for whom we observe much more variation across time and households. Our main results are presented in table 3 below, which reports the difference-in-difference estimates for school enrollment stemming from the specifications presented in the previous section.[12] We display results with village controls or fixed effects (our preferred specification), and allow for differential effects across gender by introducing an interaction term with gender for each round. The last four columns show results for narrower age groups.

We find a strong positive average effect of the SHG treatment on enrollment in the last round, of about 20 percentage points. This represents a very large treatment effect, since it corresponds to a 40% increase in post-primary school enrollment rates. We find no difference between boys and girls, as the interaction coefficient is systematically low and non-significant. (Given that

[12] We report results using a linear probability model, which has the advantage of being flexible, robust, and easy to interpret. A Probit model delivers similar average marginal effects and slightly higher significance levels.

we never found heterogeneous effects by gender in our estimations below, we drop the gender interaction terms in the tables that follow.)

[Table 3 here.]

Three main reasons might explain the strength of the effects on school enrollment in the last round. First, there is a statistical reason, which arises from the grouping of children in age categories.[13] Even if entry in secondary school increases from round 2, the effect is dampened by the presence of older children who have already dropped out but remain in the relevant age category. It is only as 'exposed' children get older and hence more numerous in the relevant age category that these effects become statistically detectable. The last round, occurring three years after the previous one and about five years after the first one, represents a sufficient time interval. In the last four columns of the table, we restrict the age window and observe that the effect is especially strong at the entry of secondary school and diluted at older ages. However, even using the younger age window, the effect is present only in the last round. A second explanation is that the evolution of enrollment rates, is a measure at the extensive margin. It is partly the outcome of intensive-margin changes occurring beforehand, such as parents making sure that enrolled children effectively attend classes, do homework, do not attend school with an empty stomach, etc. These changes, as they lead to improved school performance, are likely to increase enrollment rates in later years, but this comes with a delay. We unfortunately do not have data precise enough to test this directly, though the results about more continuous outcomes such as grade-for-age (see below), do suggest some progressivity over time. Finally and more fundamentally, the effects of SHG participation may take time to unfold, particularly with respect to education. SHGs require several years before being fully effective financially (see Baland et al., 2008). They gradually evolve over time, progressively accumulating their members' savings and linking to a commercial bank at a later stage. Moreover, changes in attitudes, preferences or expectations that follow from repeated interactions and discussions with other group members are not immediate. Informal interviews with several SHG members during the surveys suggested to us a strong sense of empowerment among members, reflected in their ability to decide and

[13] An age-specific enrollment rates analysis would have been ideal, but is not feasible given the number of observations.

make projects for themselves (see also Desai and Joshi, 2013), but this is a process that takes time. This explanation is consistent with the peer effect channel presented below.

While they are not reported in the tables, the control variables mostly behave in the expected way. Thus, enrollment rates are lower and lower as kids get older; the head's education and household's wealth (in the form of land) are positive and strongly significant determinants of schooling; first-born children are more likely to be enrolled as compared to their younger siblings, probably reflecting resource scarcity; enrollment is lower in families with babies and primary-school age children, possibly because older children are required to look after younger siblings; and the number of children of secondary-school age as well as the number of adults are positive determinants of enrollment rates, as they imply more human and financial resources for the family.

Given that children aged 12 and above in round 3 were already of primary-school age at baseline, the increase in enrollment rates can be explained by a higher transition rate from primary to middle and secondary school. In table 4, we explore this further by measuring drop-out rates directly. In our preferred specification (col. 1-2), we focus on the cohort of children who were enrolled in primary school in the first round (2004) and whom we follow over the three rounds, to analyze their school 'survival'. We find that drop-out rates at entry in secondary school in the last round are much lower for treated children, by about 15 percentage points, which confirms the previous results. We then propose two alternative specifications that use the same sample of children of secondary-school age as in table 3. In col. 3-4, we condition on the fact that they were observed being enrolled in the previous survey round. We again find that treated children have a higher probably to stayed in school than children in control villages. The last two columns perform a similar analysis but condition on the fact that the children have completed at least primary school, hence focusing explicitly on drop out at the secondary-school level. The effects are even stronger and start already in round 2 (the two previous analyses had to drop the first round because of the conditioning). In this table, we exceptionally display the age dummies because they make very clear the progressive and increasing drop out with age of control children. In general, the fact that drop-out results are stronger and show an improvement from round 2, while the basic enrollment analysis in table 3 did not, indicates that SHGs have more leverage on 'minimally concerned' households who at least put their children in primary

school at baseline. This is also consistent with the peer effect channel discussed further.

[Table 4 here.]

Enrollment is an important but admittedly crude measure of education. In the tables that follow, we therefore examine additional indicators that correspond to the 'intensive margin' of education decisions. Firstly, beyond enrollment, we also want to check the grades actually attained by children. To this end, we compute a 'grade-for-age' variable according to the following formula, which measures the proportion of potential education actually achieved. This variable takes the value one if the child is currently enrolled at the right age (e.g. 7 if the highest grade achieved is grade 1, and so on), and a value lower than 1 if the child has either repeated one or several year(s), or dropped out of school (at the extreme, if the child never went to school, the variable takes the value 0). The results are presented in table **??** below.[14] The first two columns focus on all school-age children, and show that SHG children progress quicker through grades and remain closer to the 'education frontier' over time. The effect amounts to a little more than 10 p.p. - or about 25% - in the last round. Interestingly, contrary to the external-margin indicator of enrollment, the effect is now significant, though smaller, already in round 2. That tends to confirm the above hypothesis about a progressive increase of attention and effort around the education of children, which only eventually lead to higher enrollment rates (as laggards might stick around for a while). The following two columns replicate the previous analysis conditioning on the fact that children are at school. That is, we exclude school drop-outs and focus exclusively on the intensive margin. The results are very similar and even stronger, indicating that this progression effect is not driven by drop-outs but by investments in children at school to prevent grade repetition. In columns 5-6, we check if this progression effect is already present for primary-school age children, and we find it does, which is again consistent with the idea that the lower drop-out rates observed at secondary school come from long-lasting efforts occurring much earlier. Once again, the effect is smaller but already present in round 2. Finally, the last three columns follow over time different cohorts of children who are of secondary-school age in round 3 (in the interest of space, we don't report results without village fixed effects,

[14] Unfortunately, the questionnaire did not record the highest grade achieved for school-age children currently not at school in rounds 1 and 2. Aware of this limitation, we did ask the information and added a retrospective education section in round 3. Consequently, this analysis focuses on the subsample of children observed in all rounds.

which give similar results). We find that the effect is only present for the youngest cohort (who is at the beginning of primary school at baseline), suggesting that it might be hard to change the school trajectory of children once they have already been several years in school.

[Table 5 here.]

Next, we provide further checks and refinements to the enrollment analysis in table 6, to make sure that those children are truly attending school. In the first four columns, we define two dummy variables, which indicate whether a child is enrolled either in grade 6 or beyond, or in grade 9 and beyond. These two thresholds correspond to the first year of middle and secondary school, respectively. We confirm that children in SHG villages are significantly more likely to be enrolled in middle school or beyond (by about 23 p.p.) and in secondary school (by about 10 p.p.). We then study the evolution of school expenditures. For all school-age children, we collected detailed information about expenses on tuition and other fees, uniforms, books and other school supplies, private lessons, etc. In columns 5 and 6, we look at total school expenditures, defined as the sum of all expenditures directly related to schooling. In columns 7 and 8, the dependent variable is a dummy variable that takes the value one if the annual school expenses are equal or larger than 200 INR, which corresponds to the 25^{th} percentile of the expenditure distribution for children enrolled in middle or secondary school, and provides a good proxy for actual school attendance at those higher grades.[15] We again find a strong and robust effect in round 3, for which school expenditures per children are more than doubled for children in treated villages. The probability of non-trivial school expenditures increase by about 18 percentage points in the last round, which is comparable to our estimates for enrollment rates. Finally, we also collected information about the number of days spent at school during the week preceding the survey. In last two columns, we again find a positive and sizable effect of the SHG treatment by the last round of the survey, with children in member villages spending almost 1 day per week more at school than other children.

[Table 6 here.]

[15] A sum of 200 INR roughly corresponds to the cost of a 'necessary package' comprised of a school uniform (whose modal price in our data is 100 INR) plus some books and stationery.

5.2 Child labor

Child labor and child education are often presented as substitutes in the theoretical literature (Basu and Van, 1998; Baland and Robinson, 2000).[16] A possible channel for the effects of SHGs on secondary enrollment may come from the reallocation of child time and effort in schooling at the expense of child labor. As SHGs affect household economic activities in a variety of ways via, for instance, the creation of new income opportunities, it is possible that SHGs have a direct negative impact on child labor, allowing a child to attend school more regularly and for a longer duration. The household questionnaire recorded detailed information on the time allocation of children, which allows us to investigate the relation between child labor and school enrollment. A clear distinction was made in the questionnaire between 'productive' (income-earning) activities (both in and out of the household) and 'domestic' chores (including child care, fuel wood and water collection).

Child labor is widespread in the environment under study: in round 1, more than 70% of secondary-school age children are reported as doing some kind of work, for a total of 18 weekly hours on average. While the majority of this labor regards household chores (11 hours on average), a substantial share is devoted to income-generating activities (7 hours on average and 40% of children). We investigate the impact of SHG membership on child labor using our baseline specifications in table 7 below. We use three different measures of child labor: the total number of hours worked per week, the probability of working, and the conditional number of hours worked if working. We report the estimates separately for all labor activities, as well as for productive (wage) and domestic (chores) work. For the sake of brevity, we report only the results obtained using village fixed effects (the estimates using village controls are essentially identical). We do not find any impact of SHG membership on the total number of hours worked (the coefficients are low and not significant).[17] If anything, the probability that children work tends to increase under the SHG treatment (though estimates are very imprecise), especially for domestic work by girls. To the contrary, the conditional number of hours worked tends to fall, particularly in productive activities. In other words, children of SHG households tend to

[16] One exception is Ravallion and Wodon (2000).

[17] These results run counter part of the literature which suggests that, in different contexts, microfinance increases child labor (see e.g. Wydick, 1999; Islam and Choe, 2013; Augsburg et al., 2015).

work more often part-time and at home. These findings are in line with the results obtained by Hazarika and Sarangi (2008) in the case of Malawi.

[Table 7 here.]

These findings tend to question the general presumption that child labor and education are substitutes. In Figure 1 below, we report the cumulative density function of the number of labor hours spent by a child, depending on his enrollment status. As the figure indicates, enrolled children (plain line) are not less likely to be active than non enrolled children (dotted line), but a much smaller proportion of them works for more than 30 hours. When adding the time spent at school, the overall distribution is clearly bimodal, consisting of globally active children who are at school and less active and frequently idle children who are not at school (for similar findings, see also Rosati and Tzannatos 2006 and Edmonds 2008).

[Figure 1 here.]

This issue is clearly apparent in the correlation table 8, which shows a positive correlation between the probability of working and being enrolled in school. indicate no correlation between total child labor and child enrollment. Overall, children who go to school work on average the same amount of time. However, enrolled children are more likely to work, but a lower number of hours. The two lower panels of the table indicate a clear substitution away from productive towards domestic activities: domestic hours worked increase with enrollment while productive activities tend to fall.

[Table 8 here.]

5.3 Credit

We now explore possible mechanisms that may explain the gradual increase in secondary school enrollment under the SHG program. An important role of SHGs is to bring access to credit to its members. The two main sources of credit in a typical village of our sample are moneylenders and SHGs. The contracts offered by the latter are much more favorable, even if they bear upon smaller amounts (1,270 INR, or about 20 USD, on average) and are of shorter

duration (7 months on average). They are also much more frequent. By improving access to credit and lowering borrowing costs, SHGs can facilitate enrollment, particularly as secondary schools typically involve larger costs. It must first be noted that the total amount borrowed by a household over the past twelve months in round 3 is essentially identical for members and non-members, which suggests that the amount of credit as such cannot explain increased enrollment among members' children.

In table 9, we explore the role of credit by controlling, in our baseline enrollment regression, for the acquisition of a loan and the total amount of credit taken last year (in logs). If the amounts of credit received through the SHG program were an important and significant determinant of enrollment, we should observe a positive coefficient for the credit variable and a reduction in the magnitude of the treatment coefficient in the last round. By contrast, the estimates indicate no strong relationship between credit and enrollment. If anything, enrollment seems to fall when the household takes a credit, perhaps indicating a situation of distress or adverse shocks, or the development of income earning activities that increase labor needs. More importantly, controlling for credit does not affect the estimates of our main treatment coefficients, which stay virtually unchanged. A similar conclusion was reached when using alternative measures related to credit, such as the number of loans taken, distinguishing by sources etc., or additionally controlling for household income. We therefore do not find support for credit being a determinant of enrollment. We also explored the evolution of income between members and non-members over time, and could not find any differences. We conclude that there is no clear connection between credit, income and child enrollment in our sample.

[Table 9 here.]

5.4 Peer effects

As stressed in the introduction, SHG activities cannot be reduced to microfinance. The very existence of a women's group in a village, which meets often (typically once a week), creates room for strong social interactions among its members, whereby women can openly discuss various aspects of their life, and in particular their children's education. By being exposed to other women raising similar issues, describing their aspirations and their projects, a woman can

feel encouraged to develop more ambitious goals for her children. By experiencing increased autonomy and empowerment within the SHG collective project, she can also be more assertive and proactive with respect to her children's education.

To explore this mechanism, it would be tempting to correlate the enrollment of a particular child with the enrollment of the children whose mothers belong to the same SHG. Unfortunately, this strategy suffers from serious biases (the 'reflection problem' first exposed by Manski, 1993). Alternatively, we can use the fact that women with children of the same age tend to discuss more often issues related to their children, including education. To this end, for each SHG, we measure the per-woman average number of children of the relevant age group (12 to 17) in the last round, and include this variable as a control in the baseline specification on child enrollment.[18] For households who are not member of any SHG, such peer effects are assumed to be nil (and other social interactions at the village level are either included in the controls, or absorbed in the village fixed effects). The coefficient can therefore be interpreted as an interaction effect between peer effects within SHGs and being part of such group (which is why we also control for being a member household directly). This identification strategy relies on characteristics (children aged between 12 and 17 in the last round, which corresponds to children between 7 and 12 years old in the first round) that largely pre-date the creation of the SHG and can therefore be considered exogenous.[19]

Results are reported in table 10. The first two columns show that the number of secondary-school age children of the other women of one's SHG influences positively the probability that one's own children will be enrolled (the effect is significant only with village fixed effects). Estimates suggest that, with an average per-woman number of 0.75 child aged 12-17 in 2009 in SHG groups, enrollment for SHG members increases by more than 8 percentage points, which is sizable. In the next four columns, we present a placebo test, where instead of measuring the number of children aged between 12 and 17, we take the number of children who are beyond secondary-school age (18-23). Clearly, the latter should have no impact on schooling decisions of members with younger children, which is what we observe (whether we put it separately or

[18] More precisely, we compute, for each woman, the average per-woman number of children of the other women belonging to the same group, so as to correctly capture the effects of the other members on a particular member's decisions. The measure is therefore member specific, and varies between women of the same group.

[19] However, to the extent that groups are based on self-selection, the causal interpretation remains subject to caution, and our estimations should be considered as suggestive.

together with the relevant age group). Finally, in the two last columns (7 and 8), we exclude households in which the head has been to secondary school, since the role of peer effects is expected to be weaker when parents have such experience (we focus on heads' education since more than 80% of mothers have no education at all and only 2% went to secondary school). Interestingly, we find that peer effects are much larger and more significant when focusing on households with no secondary education. The main treatment coefficient (SHG village X Round 3) is correspondingly reduced.

[Table 10 here.]

We perform the same replication exercise for the other main education outcome, namely grade-for-age. Here again, we find evidence of positive peer effects (see table 11). [DO YOU WANT TO SAY MORE HERE ?]

[Table 11 here.]

It should be noted that the coefficients attached to SHG in the third round remain large and significant in most specifications, which implies that the peer effects we measure represent only part of the explanation. Another possible implication of the social interactions at work within the SHGs is the 'transformative' role of those groups, in the sense of female emancipation. A number of papers in the literature have pointed out that, because of the support of the group, improved financial capacities and the ability to formulate individual projects, female empowerment is a major consequence of micro-finance groups (e.g. Pitt and Khandker, 1998; Mosley and Rock, 2004; Ashraf et al., 2010; Bali Swain and Wallentin, 2012; Desai and Joshi, 2013). Unfortunately, our survey questionnaire did not include precise and consistent information on those issues, but our preliminary results, which we we do not report here, suggest that SHG members tend indeed to develop more self-employment occupations and self-confidence.

6 Conclusion

In this paper, we investigate the effects of participation in Self-Help Groups, the dominant form of microfinance in India, on post-primary school enrollment. To this end, we use an original

panel data set collected in the whole state of Jharkhand between 2004 and 2009. We find evidence that children's school enrollment increases with SHG membership, by about 20 percentage points, a very impressive improvement. This change occurs essentially through a lower dropout rate in middle and secondary school. The effects on enrollment rates are detected only in the last survey round, which suggests that they need time materialize (in this case, 6 years after the start of the SHG program in the area). However, we show evidence that they are prepared by intensive-margin efforts happening much before, which allow children to progress more quickly though grades.

We find that these effects do not come from a substitution away from child labor. Rather, member children tend to become more active over time, with a higher probability to work part-time on domestic chores. While we do not detect any direct role of credit, we find evidence of peer effects, which positively affect the schooling decisions of fellow SHG members. This suggests that the social interactions that take place in those groups are, for decisions such as education, more important than the improved access to credit. The transformative role of self-help groups, a dimension repeatedly emphasized by NGOs and social workers active in the area, is an important dimension that needs more systematic research efforts.

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7 Tables

Table 1: Sample dynamics, by survey round

	round 1	round 2	round 3
Number of households	1,060	1,068	1,074
% attrition w.r.t. previous round	-	6.0	7.4
Number of new households	-	73	70
% change of treatment status (SHG members exiting groups)	-	4.8	8.2
% change of treatment status (non members joining SHGs)	-	9.3	4.1

Table 2: Enrollment rates of primary and post-primary school-age children: descriptive statistics

Age	7-8	Primary (6-11)				Post-primary (12-17)			
Category	All	All	Members	Non-members	Controls	All	Members	Non-members	Controls
A. All children									
Round 1	0.800	0.761	0.785	0.761	0.695	0.450	0.490	0.381	0.471
	(348)	*(1,090)*	*(522)*	*(356)*	*(210)*	*(646)*	*(298)*	*(210)*	*(138)*
Round 3	0.889	0.867	0.907	0.816	0.852	0.672	0.711	0.628	0.669
	(379)	*(1,181)*	*(530)*	*(374)*	*(216)*	*(740)*	*(332)*	*(231)*	*(145)*
B. Boys only									
Round 1	0.817	0.810	0.857	0.811	0.703	0.540	0.597	0.431	0.581
	(180)	*(563)*	*(258)*	*(185)*	*(118)*	*(337)*	*(154)*	*(109)*	*(74)*
Round 3	0.886	0.880	0.930	0.825	0.857	0.699	0.733	0.677	0.667
	(184)	*(600)*	*(257)*	*(194)*	*(119)*	*(385)*	*(161)*	*(124)*	*(84)*
C. Girls only									
Round 1	0.780	0.707	0.716	0.706	0.685	0.351	0.378	0.320	0.344
	(168)	*(526)*	*(264)*	*(170)*	*(92)*	*(307)*	*(143)*	*(100)*	*(64)*
Round 3	0.891	0.853	0.885	0.804	0.845	0.642	0.695	0.562	0.672
	(193)	*(577)*	*(270)*	*(179)*	*(97)*	*(349)*	*(167)*	*(105)*	*(61)*

Number of observations in parentheses.

Table 3: Enrollment of children of secondary-school age

age group:	12-17				12-14		15-17	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SHG village	-0.0907	-0.0717						
	(0.0578)	(0.0755)						
SHG village X Round 2	-0.00444	-0.0119	-0.0181	-0.0125	-0.0302	-0.0288	-0.0189	-0.0811
	(0.0714)	(0.0956)	(0.0716)	(0.0852)	(0.112)	(0.135)	(0.0939)	(0.136)
SHG village X Round 3	0.178**	0.222**	0.176**	0.232***	0.171*	0.226*	0.149	0.142
	(0.0696)	(0.0944)	(0.0707)	(0.0857)	(0.0899)	(0.118)	(0.104)	(0.144)
Female	-0.0859**	-0.129	-0.0828**	-0.181***	-0.0511	-0.119	-0.0973*	-0.0795
	(0.0413)	(0.0914)	(0.0418)	(0.0550)	(0.0464)	(0.142)	(0.0570)	(0.134)
Female X SHG village		-0.0511				0.0411		-0.184
		(0.108)				(0.154)		(0.149)
Female X SHG village X Round 2		0.0278		-0.00607		-0.0137		0.154
		(0.130)		(0.0937)		(0.195)		(0.195)
Female X SHG village X Round 3		-0.104		-0.130		-0.138		0.0479
		(0.137)		(0.0993)		(0.182)		(0.182)
Village controls	yes	yes	no	no	no	no	no	no
District fixed effects	yes	yes	no	no	no	no	no	no
Village fixed effects	no	no	yes	yes	yes	yes	yes	yes
N	1673	1673	1673	1673	825	825	848	848
R^2	0.236	0.241	0.258	0.263	0.242	0.246	0.307	0.315
Round 1 mean of dep. var.	0.450	0.450	0.450	0.450	0.597	0.597	0.317	0.317

All equations include year (round) fixed effects, age and birth order dummies, the full set of household controls H described in the text, and rainfall shocks in years t-1 and t-2. Observations are weighted in order to account for the different sampling probabilities. Standard errors clustered at the household level in parentheses (*p<0.10, **p<0.05, ***p<0.01).

Table 4: Drop-out analysis

Enrollment of:	cohort of children aged 7-12 and enrolled in round 1		children aged 12-17 who: were enrolled in previous round		completed primary school	
	(1)	(2)	(3)	(4)	(5)	(6)
SHG village	-0.0380		-0.106*		-0.227***	
	(0.0319)		(0.0564)		(0.0645)	
SHG village X Round 2					0.238***	0.222**
					(0.0884)	(0.0900)
SHG village X Round 3	0.149***	0.150***	0.225***	0.243***	0.382***	0.372***
	(0.0515)	(0.0517)	(0.0774)	(0.0863)	(0.0782)	(0.0842)
Age 10-11	-0.0392	-0.0360				
	(0.0283)	(0.0310)				
Age 12-13	-0.0563	-0.0562				
	(0.0344)	(0.0362)				
Age 14-15	-0.171***	-0.172***	-0.0934***	-0.0957***	-0.0503	-0.0556
	(0.0442)	(0.0461)	(0.0353)	(0.0363)	(0.0338)	(0.0341)
Age 16-17	-0.397***	-0.393***	-0.265***	-0.261***	-0.300***	-0.301***
	(0.0817)	(0.0843)	(0.0547)	(0.0560)	(0.0393)	(0.0393)
Survey rounds used in estimation	2,3	2,3	2,3	2,3	1,2,3	1,2,3
Village controls	yes	no	yes	no	yes	no
District fixed effects	yes	no	yes	no	yes	no
Village fixed effects	no	yes	no	yes	no	yes
N	1064	1064	659	659	867	867
R^2	0.225	0.241	0.175	0.210	0.246	0.268
Baseline mean of dep. var.	0.897	0.897	0.790	0.790	0.814	0.814

All equations include year (round) fixed effects, age and birth order dummies, the full set of household controls H described in the text, and rainfall shocks in years t-1 and t-2. Observations are weighted in order to account for the different sampling probabilities. Standard errors clustered at the household level in parentheses (*p<0.10, **p<0.05, ***p<0.01).

Table 5: Grade-for-age ratio

	Children aged 6-17				Children aged 6-11		Cohorts of children aged in round 3:		
	all		currently enrolled		all		12-17	12-14	15-17
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SHG village	-0.0621*		-0.0657*		-0.0698				
	(0.0355)		(0.0372)		(0.0442)				
SHG village X Round 2	0.0677*	0.0589	0.0893**	0.0770**	0.102**	0.0907*	0.0312	0.0578	0.00337
	(0.0369)	(0.0375)	(0.0371)	(0.0375)	(0.0489)	(0.0492)	(0.0411)	(0.0568)	(0.0512)
SHG village X Round 3	0.129***	0.108***	0.140***	0.109**	0.165***	0.144**	0.0761*	0.139**	0.000899
	(0.0391)	(0.0397)	(0.0418)	(0.0423)	(0.0548)	(0.0560)	(0.0438)	(0.0580)	(0.0605)
Village controls	yes	no	yes	no	yes	no	no	no	no
District fixed effects	yes	no	yes	no	yes	no	no	no	no
Village fixed effects	no	yes	no	yes	no	yes	yes	yes	yes
N	3807	3807	3186	3186	2398	2398	1836	905	931
R^2	0.156	0.175	0.199	0.221	0.130	0.151	0.261	0.299	0.311
Round 1 mean of dep. var.	0.484	0.484	0.501	0.501	0.458	0.458	0.475	0.415	0.527

Grade-for-age ratio = $\frac{\text{highest grade achieved}}{\text{age} - 6}$. All equations include year (round) fixed effects, age and birth order dummies, the full set of household controls H described in the text, and rainfall shocks in years t-1 and t-2. Observations are weighted in order to account for the different sampling probabilities. Standard errors clustered at the household level in parentheses (*p<0.10, **p<0.05, ***p<0.01).

Table 6: Grade-specific enrollment, school expenditures and attendance of children aged 12-17

	Enrollment in grade ≥ 6		Enrollment in grade ≥ 9		School expenditures amount (log)		School expenditures ≥ 200 dummy		School attendance days per week	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
SHG village	-0.143**		-0.0602		-0.561		-0.0905		-0.556*	
	(0.0618)		(0.0403)		(0.360)		(0.0695)		(0.293)	
SHG village X Round 2	-0.00132	-0.0152	0.0293	0.0266	-0.111	-0.206	0.0215	0.00431	0.0746	-0.00899
	(0.0766)	(0.0772)	(0.0482)	(0.0486)	(0.444)	(0.445)	(0.0817)	(0.0817)	(0.348)	(0.346)
SHG village X Round 3	0.241***	0.229***	0.0954**	0.0971**	1.402***	1.381***	0.175**	0.178**	0.967***	0.937***
	(0.0769)	(0.0778)	(0.0473)	(0.0486)	(0.446)	(0.454)	(0.0863)	(0.0857)	(0.350)	(0.354)
Village controls	yes	no	yes	no	yes	no	yes	no	yes	no
District fixed effects	yes	no	yes	no	yes	no	yes	no	yes	no
Village fixed effects	no	yes	no	yes	no	yes	no	yes	no	yes
N	1673	1673	1673	1673	1650	1650	1650	1650	1673	1673
R^2	0.176	0.205	0.140	0.157	0.215	0.237	0.161	0.201	0.230	0.252
Round 1 mean of dep. var.	0.285	0.285	0.085	0.085	248.5	248.5	0.339	0.339	2.14	2.14

All equations include year (round) fixed effects, age and birth order dummies, the full set of household controls H described in the text, and rainfall shocks in years t-1 and t-2. Observations are weighted in order to account for the different sampling probabilities. Standard errors clustered at the household level in parentheses (*p<0.10, **p<0.05, ***p<0.01).

Table 7: Child labor: weekly hours worked by children aged 12-17

	Total number of hours			Any work (dummy)			Conditional nb. of hours (if >0)		
	total	productive	domestic	total	productive	domestic	total	productive	domestic
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SHG village X Round 2	0.346	0.410	-0.0975	0.0272	-0.0326	-0.0368	-0.349	-0.932	-0.853
	(3.425)	(1.984)	(2.422)	(0.0905)	(0.0869)	(0.118)	(3.619)	(3.249)	(2.452)
SHG village X Round 3	-1.149	-2.082	0.914	0.0883	0.0356	0.0313	-3.587	-7.167**	1.155
	(3.026)	(2.214)	(2.036)	(0.0810)	(0.0940)	(0.103)	(3.211)	(3.328)	(2.246)
Female	6.173***	-4.317***	10.52***	0.161***	-0.0705	0.320***	3.457*	-7.644***	8.980***
	(1.789)	(1.470)	(1.409)	(0.0588)	(0.0681)	(0.0536)	(2.082)	(2.526)	(1.648)
Female X SHG village X Round 2	-2.396	-3.430	1.062	0.0222	0.107	0.100	-3.302	-8.012**	0.934
	(3.340)	(2.131)	(2.458)	(0.0868)	(0.111)	(0.109)	(3.287)	(3.111)	(2.467)
Female X SHG village X Round 3	1.241	-0.515	1.758	0.0547	-0.00409	0.190*	-0.172	0.126	-2.258
	(3.046)	(2.090)	(2.088)	(0.0828)	(0.101)	(0.0978)	(3.022)	(2.682)	(2.296)
Village fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
N	1673	1673	1673	1673	1673	1673	1363	1014	1071
R^2	0.131	0.172	0.224	0.135	0.232	0.224	0.168	0.248	0.277
Round 1 mean of dep. var.	16.89	7.28	9.64	0.670	0.398	0.471	25.19	18.30	20.48

All equations include year (round) fixed effects, age and birth order dummies, the full set of household controls H described in the text, and rainfall shocks in years t-1 and t-2. Observations are weighted in order to account for the different sampling probabilities. Standard errors clustered at the household level in parentheses (*p<0.10, **p<0.05, ***p<0.01).

Table 8: Correlation between school enrollment and work of children aged 12-17

	Total work		Productive (wage) work		Domestic (chores) work	
	weekly hours	dummy	weekly hours	dummy	weekly hours	dummy
All	-0.038	0.156	-0.219	-0.053	0.169	0.276
	(0.061)	(0.000)	(0.000)	(0.017)	(0.000)	(0.000)
Boys	-0.099	0.117	-0.265	-0.073	0.224	0.307
	(0.000)	(0.000)	(0.000)	(0.018)	(0.000)	(0.000)
Girls	0.056	0.236	-0.188	-0.033	0.212	0.335
	(0.058)	(0.000)	(0.000)	(0.296)	(0.000)	(0.000)

Significance levels in parentheses.

Table 9: Enrollment of children aged 12-17: role of credit

	(1)	(2)	(3)	(4)
SHG village	-0.0877		-0.0861	
	(0.0579)		(0.0571)	
SHG village X Round 2	-0.00592	-0.0185	-0.0105	-0.0227
	(0.0712)	(0.0712)	(0.0709)	(0.0708)
SHG village X Round 3	0.171**	0.169**	0.168**	0.165**
	(0.0701)	(0.0711)	(0.0698)	(0.0707)
Any credit last year (dummy)	-0.0520*	-0.0684**	-0.213*	-0.227**
	(0.0288)	(0.0293)	(0.110)	(0.104)
Amount of credit last year (log)			0.0216	0.0214
			(0.0143)	(0.0134)
Village controls	yes	no	yes	no
District fixed effects	yes	no	yes	no
Village fixed effects	no	yes	no	yes
N	1673	1673	1673	1673
R^2	0.239	0.260	0.241	0.262
Round 1 mean of dep. var.	0.450	0.450	0.450	0.450

All equations include year (round) fixed effects, age and birth order dummies, the full set of household controls H described in the text, and rainfall shocks in years t-1 and t-2. Observations are weighted in order to account for the different sampling probabilities. Standard errors clustered at the household level in parentheses (*p<0.10, **p<0.05, ***p<0.01).

Table 10: Enrollment of children aged 12-17: peer effects

	All households						Removing hh. whose head went to secondary school	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SHG village	-0.123**		-0.117*		-0.120*		-0.143*	
	(0.0610)		(0.0612)		(0.0611)		(0.0769)	
SHG village X Round 2	0.0201	0.0113	0.0165	0.0104	0.0150	0.00862	-0.00560	-0.0582
	(0.0740)	(0.0741)	(0.0729)	(0.0733)	(0.0725)	(0.0729)	(0.0828)	(0.0813)
SHG village X Round 3	0.158**	0.151**	0.160**	0.152**	0.159**	0.151**	0.147*	0.111
	(0.0718)	(0.0732)	(0.0716)	(0.0728)	(0.0717)	(0.0731)	(0.0867)	(0.0872)
Nb. of children per SHG member:								
- aged 12-17 in Round 3	0.0729	0.108*			0.101*	0.121**	0.139**	0.179***
	(0.0532)	(0.0584)			(0.0554)	(0.0585)	(0.0545)	(0.0614)
- aged 18-23 in Round 3 (placebo)			-0.0161	0.0225	-0.0844	-0.0457		
			(0.0883)	(0.0963)	(0.0951)	(0.101)		
SHG member household	-0.00353	-0.0412	0.0467	0.0121	0.0163	-0.0304	-0.0442	-0.0551
	(0.0524)	(0.0562)	(0.0557)	(0.0598)	(0.0587)	(0.0634)	(0.0595)	(0.0632)
Village controls	yes	no	yes	no	yes	no	yes	no
District fixed effects	yes	no	yes	no	yes	no	yes	no
Village fixed effects	no	yes	no	yes	no	yes	no	yes
N	1475	1475	1475	1475	1475	1475	1013	1013
R^2	0.240	0.262	0.238	0.259	0.241	0.262	0.263	0.302
Round 1 mean of dep. var.	0.450	0.450	0.450	0.450	0.450	0.450	0.369	0.369

All equations include year (round) fixed effects, age and birth order dummies, the full set of household controls H described in the text, and rainfall shocks in years t-1 and t-2. Observations are weighted in order to account for the different sampling probabilities. Standard errors clustered at the household level in parentheses (*p<0.10, **p<0.05, ***p<0.01).

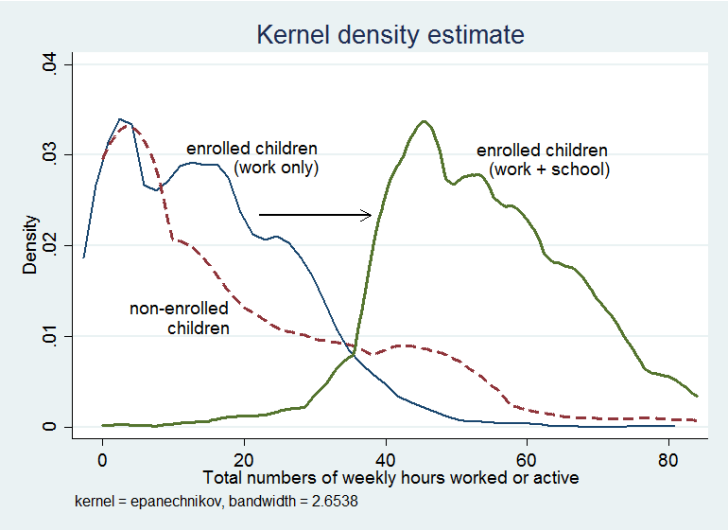
Table 11: Grade-for-age ratio: peer effects

	All children aged 6-17				Enrolled children aged 6-17		Cohort of children aged 12-17 in Round 3	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SHG village	-0.0702*		-0.0682*		-0.0712*		-0.0658	
	(0.0370)		(0.0371)		(0.0387)		(0.0434)	
SHG village X Round 2	0.0650*	0.0618	0.0636*	0.0609	0.0845**	0.0796**	0.0590	0.0510
	(0.0381)	(0.0389)	(0.0383)	(0.0390)	(0.0389)	(0.0394)	(0.0435)	(0.0438)
SHG village X Round 3	0.134***	0.116***	0.133***	0.115***	0.151***	0.121***	0.0842*	0.0783*
	(0.0395)	(0.0402)	(0.0396)	(0.0403)	(0.0422)	(0.0428)	(0.0436)	(0.0439)
Nb. of children per SHG member:								
- aged 6-17 in Round 3	0.0197	0.0267**			0.0180	0.0296**		
	(0.0125)	(0.0132)			(0.0123)	(0.0131)		
- aged 18-23 in Round 3 (placebo)			0.0406	0.0568				
			(0.0412)	(0.0427)				
- aged 12-17 in Round 3							0.0545*	0.0867**
							(0.0320)	(0.0336)
SHG member household	0.00191	-0.0121	0.0119	-0.000966	-0.00648	-0.0219	-0.0154	-0.0349
	(0.0276)	(0.0285)	(0.0281)	(0.0288)	(0.0272)	(0.0282)	(0.0350)	(0.0359)
Village controls	yes	no	yes	no	yes	no	yes	no
District fixed effects	yes	no	yes	no	yes	no	yes	no
Village fixed effects	no	yes	no	yes	no	yes	no	yes
N	3376	3376	3376	3376	2822	2822	1619	1619
R^2	0.174	0.192	0.174	0.192	0.215	0.237	0.261	0.289
Round 1 mean of dep. var.	0.484	0.484	0.484	0.484	0.501	0.501	0.475	0.475

Grade-for-age ratio $= \frac{\text{highest grade achieved}}{\text{age} - 6}$. All equations include year (round) fixed effects, age and birth order dummies, the full set of household controls H described in the text, and rainfall shocks in years t-1 and t-2. Observations are weighted in order to account for the different sampling probabilities. Standard errors clustered at the household level in parentheses (*p<0.10, **p<0.05, ***p<0.01).

8 Figures

Figure 1: Distribution of the number of weekly hours of activity, by enrollment status



A Descriptive statistics about the sample

Table 12: Sample villages and district

Region	District	Village	Type
Northeast	Banka†	Fattapathar	Member
Northeast	Banka†	Kanibel	Member
Northeast	Banka†	Devhar	Control
Northeast	Banka†	Bagmunda	Member
Northeast	Dumka	Gwalshimla	Member
Northeast	Dumka	Sitasal	Member
Northeast	Dumka	Tetriya	Member
Northeast	Dumka	Barhet	Control
Northeast	Dumka	Ranga	Control
Central	Hazaribagh	Bigha	Member
Central	Hazaribagh	Debo	Member
Central	Hazaribagh	Ranik	Member
Central	Hazaribagh	Rupin	Control
Central	Koderma	Garhai	Member
Central	Koderma	Irgobad	Member
Central	Koderma	Saanth	Member
Central	Koderma	Lariyadih	Control
Southeast	E. Singhbhum	Haldipokhar	Member
Southeast	E. Singhbhum	Murasai	Member
Southeast	E. Singhbhum	Pukhuria	Member
Southeast	E. Singhbhum	Pathar Banga	Control
Southeast	W. Singhbhum	Baihatu	Member
Southeast	W. Singhbhum	Chandra Jarki‡	Member
Southeast	W. Singhbhum	Kera	Member
Southeast	W. Singhbhum	Mermera	Member
Southeast	W. Singhbhum	Unchibita	Member
Southeast	W. Singhbhum	Jarki	Control
Southeast	W. Singhbhum	Nakti	Control
Southwest	Gumla	Jaldega	Member
Southwest	Gumla	Semra	Member
Southwest	Gumla	Umra	Member
Southwest	Gumla	Kurum	Control
Southwest	Khunti	Banabira	Member
Southwest	Khunti	Bhandara	Member
Southwest	Khunti	Udikel	Member
Southwest	Khunti	Irud	Control
Southwest	Khunti	Kamra	Control

Notes: † Bihar. ‡ Chandra Jarki replaced Kera in round 3 due to insecurity reasons.

Table 13: District poverty (data from 2001 Census if not otherwise indicated)

District	Population (thousands)	BPL households[1]	SC (%)	ST (%)	Female literacy (%)	Infant mortality (‰)	Households electrified (%)[2]
Banka	1,608.8	215,784	12.4	4.7	28.7	56	4.7
Dumka	1,759.6	125,701	7.3	39.9	32.3	47	7.7 / 20.4
Hazaribagh	2,277.5	222,810	15.0	11.8	42.8	46	34.7 / 57.2
Koderma	499.4	51,282	14.4	0.8	33.6	46	21.7 / 31.2
E. Singhbhum	1,983.0	117,918	4.7	27.8	57.3	36	47.4 / 67.1
W. Singhbhum	2,082.8	152,560	4.9	53.4	34.4	54	16.5 / 22.5
Gumla	1,346.8	87,546	5.0	68.4	39.9	60	5.1 / 6.8
Khunti	2,785.1	207,187	5.2	41.8	51.7	45	29.9 / 48.1

Notes: [1] 2002-07, official BPL list from the Government of Jharkhand (Bihar for Banka).
[2] Figures on the right are from a household survey by the Ministry of Health and Family Welfare in 2002-04.

Table 14: Baseline village characteristics and balance check

	control villages	treated villages	p-value treated = control
Population (# households)[1]	167.4	166.4	0.977
SC population(%)[1]	0.107	0.114	0.891
ST population(%)[1]	0.473	0.464	0.958
Landless population (%)[1]	0.246	0.300	0.577
Illiterate population (%)[1]	0.663	0.642	0.589
Female illiterate population (%)[1]	0.774	0.767	0.862
Farming population (%)[1]	0.352	0.366	0.892
Working gender-parity index[1]	0.472	0.512	0.785
Unemployment (%)[1]	0.408	0.353	0.591
Female unemployment (%)[1]	0.588	0.560	0.850
Caste / tribe fractionalization[2, 4]	0.583	0.512	0.504
Language fractionalization[2, 4]	0.347	0.358	0.888
Religious fractionalization[2, 4]	0.402	0.298	0.246
Hinduism is main village religion[3]	0.637	0.596	0.761
All-weather road reaches village[3]	0.266	0.196	0.586
Electricity available in village[3]	0.403	0.439	0.840
Irrigated land (%)[3]	13.33	13.34	0.999
Distance to nearest bank (km)[3]	6.028	7.284	0.506
Distance to nearest primary health center (km)[3]	5.083	5.909	0.551
Distance to nearest fair price shop (km)[3]	2.611	4.509	0.272
Distance to nearest market (km)[3]	5.111	5.727	0.628
Distance to nearest rail station (km)[3]	23	20	0.780
Presence of a bus stop in village[3]	0.278	0.205	0.655
Distance to nearest bus stop (km)[3]	2.917	3.557	0.587
Presence of a primary school in village[3]	0.778	0.773	0.973
Presence of a middle school in village[3]	0.278	0.364	0.592
Presence of a secondary school in village[3]	0	0.0455	0.366
Distance to nearest secondary school (km)[3]	8.333	7.182	0.559
observations	12	24	

Sources of data: [1] Census of India 2001. [2] Using round 1 data of our own household survey. [3] Data from our own village survey. [4] Probability that two randomly-drawn individuals belong to different groups (commonly known as ethno-linguistic fractionalization index): $f = 1 - \sum_{i=1}^{n} s_i^2$, where s_i refers to the sample share of the ith group.

Table 15: Baseline household and children characteristics used as control variables in the regressions and balance check (round 1 data)

	Members (M)	Nonmembers (NM)	p-value M=NM	Controls (C)	p-value C=(NM+M)
A. Household characteristics					
Scheduled caste (SC)	0.139	0.057	0.000	0.061	0.073
Scheduled tribe (ST)	0.364	0.412	0.153	0.449	0.099
Hindu	0.670	0.671	0.982	0.626	0.235
Below official poverty line	0.529	0.484	0.197	0.439	0.079
Head's age	42.8	45.5	0.001	45.0	0.306
Mother's age	38.5	40.2	0.039	40.2	0.332
Head's years of education	3.41	3.10	0.218	2.82	0.114
Mother went to school	0.189	0.169	0.461	0.124	0.062
Own some land	0.936	0.876	0.002	0.965	0.009
Land owned (acres)	1.95	1.74	0.241	1.85	0.966
Number of babies aged 0-5 years	1.03	0.84	0.008	0.94	0.085
Number of children aged 6-17 years	1.72	1.46	0.008	1.58	0.845
Number of adults	3.06	3.04	0.893	3.13	0.521
observations	467	386		198	
B. School-age children characteristics					
Age	11.4	11.4	0.964	11.5	0.697
Female	0.492	0.490	0.931	0.442	0.108
Head's child	0.813	0.770	0.063	0.806	0.662
First-born child	0.303	0.304	0.968	0.297	0.830
observations	758	531		335	