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# Responsive Care and Child Development in Rural China

End line report for the impact evaluation of the One Sky program in Ye County

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Contributors Amsterdam Institute for International Development:

Menno Pradhan

Emilie Berkhout

Contributors China Development Research Foundation:

Shaoping Li

Mary Young

Contributor Henan University:

Guirong Li

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# List of abbreviations

ASQ-3	Ages and Stages Questionnaires, third version
ASQ-SE	Ages and Stage Questionnaires, Social-Emotional
ATET	Average Treatment Effect on the Treated
CDRF	China Development Research Foundation
ECD	Early Childhood Development
eHCI	Early Human Capabilities Index
ITT	Intent-To-Treat
IV	Instrumental Variables
LATE	Local Average Treatment Effect
PCI	Parent-Child Interaction Scale
RCT	Randomized Controlled Trial
WHO	World Health Organization

### 1 Introduction

#### 1.1 Context

Since the market reforms from a centrally-planned to a market-based economy, China has experienced the fastest sustained economic growth by a major economy in history, lifting many people out of poverty. Yet, in the rural areas, 55 million people were still living in poverty in 2015 (using a poverty line of per capita rural net income of RMB 2,300 per year in 2010 constant prices)<sup>1</sup>. Due to limited employment opportunities in rural areas and a place-based household registration system known as *hukou*, parents often migrate to urban areas to generate an income, while leaving their children behind<sup>2</sup>. The *hukou* system says that people can only exercise their welfare rights, such as health care and education, in their home village in order to prevent mass migration to the cities (Biao, 2007). As the children cannot go to school in any other place but their home village, they have to stay behind. It is estimated that 61 million children are raised by their grandparents or other caregivers<sup>3</sup>. They will not get the interaction with their parents that is essential for their development (Britto et al., 2017). Generally, grandparents are also less educated than the parents are, and the education level of the caregiver is a strong predictor for the education level of the child. Moreover, without their parents' love and discipline, these children have a higher risk of developing mental illness and aggressive behaviour (Fan et al., 2010).

Recently, the Government has taken formal action to improve the situation of the children that are left behind. On April 5, 2016, 27 government institutions and other Chinese organizations<sup>4</sup> formally established a network to form a stronger safety net for these children. They announced to carry out a nationwide census on the left-behind children, as a first attempt to gain a proper account of their number, and to improve and implement policies allowing children of migrant workers to participate in exams in cities<sup>5</sup>. In addition, the Government issued a new directive, emphasizing existing laws on child abandonment and reminding local governments of their duty to protect vulnerable children<sup>6</sup>.

#### 1.2 Project description

One Sky attempts to improve the development of children living in poverty or left behind in Ye County, Henan Province. They use a Responsive Care model aimed at enhancing adult-child interaction, which was developed by Half the Sky Foundation and Chunhui Bo'Ai Children's Foundation. This model has been implemented in child welfare institutions (e.g. orphanages) over the past 15 years and has become the national standard adopted by the Ministry of Civil Affairs for all these institutions. One Sky adapted the Responsive Care program to rural areas with a high proportion of left-behind children between 0 and 6 years old, in Ye County, Henan province. The goal of the program is to improve child development by ensuring that every child receives the loving care and attention that it needs, not only for survival, but to thrive and reach full potential<sup>7</sup>. It comprises three village-based interventions: family skills training, preschool, and community engagement to involve the entire community in the welfare of its children. The next paragraphs describe these interventions in more detail with information acquired from the website, field visits and conversations with One Sky.

First, the family skills training consists of group sessions at the Family Centre (usually a refurbished village meeting hall). The Family Skills component teaches primary caregivers how to enhance their

<sup>&</sup>lt;sup>1</sup> http://www.worldbank.org/en/country/china/overview

<sup>&</sup>lt;sup>2</sup> http://www.bbc.com/news/world-asia-china-35994481

<sup>&</sup>lt;sup>3</sup> The All-China Women's Federation Task Force. National Rural Left-behind Children: Research Report on the Status of Migrant Children in Urban and Rural Areas. Chinese Women's Movement, 2013(06):30-34.

<sup>&</sup>lt;sup>4</sup> Ministries of civil affairs, education, public security, justice, finance, human resources and social security, and agriculture, the Supreme People's Court, Supreme People's Procuratorate, and organizations related to women, youngsters and disabled people, among others

<sup>&</sup>lt;sup>5</sup> http://news.xinhuanet.com/english/2016-04/07/c 135258220.htm

<sup>&</sup>lt;sup>6</sup> http://www.gov.cn/zhengce/content/2016-02/14/content 5041066.htm

<sup>&</sup>lt;sup>7</sup> http://onesky.org/about-onesky/the-situation/, http://onesky.org/about-onesky/our-solution/

interaction with their infants and toddlers between 0 and 3 years old, such as playing, talking/singing, and using books and toys. Locally recruited and trained Parent Mentors hold weekly group sessions to discuss, demonstrate and practice responsive care activities. They use WeChat (a mobile messaging app) to inform not only the caregivers, but also the parents if they migrated, about the parenting training and about the development of the children. By doing this, they hope to encourage the parents to visit their child more often. If caregivers are not able to come to the centre, the teacher will do a home visit and shares the class content in a group chat.

Second, for the preschool component, existing preschools in the villages are refurbished with age appropriate equipment and materials. Half the Sky trains the teachers in 12 sessions (training/practice/feedback), with monthly trainings afterwards to stay up to date. The teachers also receive a book containing all the details of the Responsive Care model for each age group<sup>8</sup> of children between 3 and 6 years old. The content is based on child centred, activity based learning with emphasis on building socio-emotional relationships between adults and children. It encourages children to actively participate in the classes. One Sky aims for small classes, i.e. 10 to 15 students per teacher.

It is important to note that One Sky has to compete with other preschools in the treatment villages. Their main unique selling points are their teaching method and the small class sizes.

Finally, the community engagement component is geared toward strengthening rural communities and providing a nurturing home for young children despite parental absence by offering trainer-facilitated village gatherings, monthly community projects (community garden, field trips and treasure hunts with pre-schoolers, etc.), and cooperative childcare to give weary grandparents regular respite<sup>9</sup>. This component is flexible and adjusts to the needs of the villagers.

#### 1.3 Purpose of the end line report

The purpose of the evaluation study is to assess the impact of the One Sky program. The impact is measured by comparing parent behaviour and child development at three points in time: baseline in August 2015, another baseline in July 2016 and end line in July 2017. Hence, this report presents the impact of the One Sky programme one and two years after the baseline survey, measuring the effect of between 10 and 20 months of implementation. More details on this are provided in section 2.3. The programme is evaluated as a whole, but the report also shows results separately for the family skills and preschool components. The impact of the community engagement component cannot not be filtered out.

Factors that enhance or hinder implementation and use of the program within a community, its replicability, benefit to cost of the program and effect on teacher behaviour are not part of this report. These aspects will be analysed using a qualitative approach, which will be presented in a separate report.

The next sections describe the end line results of the One Sky evaluation. While section 2 describes the methodology, section 3 and 4 show the results of the evaluation and section 5 concludes.

# 2 Methodology

This section starts with a description of the Theory of Change and the evaluation questions that we address in this report. We continue with describing the instruments and sample that we use to answer these questions, after which we elaborate on the issues that we encountered during the study such as limited implementation and attrition. The last paragraph provides the statistical approach that deals with those issues.

<sup>&</sup>lt;sup>8</sup> There are separate books for the Family Skills component and the Preschool component.

<sup>&</sup>lt;sup>9</sup> http://onesky.org/about-onesky/our-solution/models-for-change/villages/

#### 2.1 Theory of Change and evaluation questions

Brain development and skills are shaped by the "Serve and Return"<sup>10</sup> nature of human interaction, among mother-child, other family relationships (fathers, grandparents), or outside of family – with care providers, teachers and other adults in the community. New data from neuroscience, genetics and biological sciences indicate that early enriched environments can mitigate effects of disadvantage on later cognitive outcomes, mental health, and executive functioning. This is reflected in the high rate of return to human capital investment in that period (**Error! Reference source not found.**) and shows that the first years of a child's life are critical for their brain development.



SOURCE: J.J. Heckman, "Skill formation and the economics of investing in disadvantaged children." Science, 312(5782):1900-2, (June 2006).

#### Figure 1 Rates of return to human capital investment

The new science of the benefits of enriched early environments suggests an important rationale for investments in the quality of Early Childhood Development (ECD) services, with particular attention to the most vulnerable children and families. Emerging principles from quality improvement of home and community based programs indicate that emphasis on sensitivity, responsiveness and language interaction are the active ingredients, or effectiveness factors of quality. Similarly, same sensitivity and responsiveness in trainer relationship with visitors / mothers / promoters constitute the quality of ECD services.

The family skills (responsive care) and preschool training components are based on a theory of change, which posits that the child's developmental status gradually improves as family caregivers respond to children with warmth, sensitivity, consistency and rich language in their interaction. This will also have a positive effect among adult caregivers. In particular, as left-behind children become more attractive interactional partners, they will engender increased and continued attachment and engagement of grandparents and other family members. As the cycle progresses, adults will be more open and responsive to training, and their increasingly positive adult skills will begin to replace their neglectful (or harsh, inconsistent) adult behaviours toward the children. This replacement will be reinforced and accelerated as grandparents and other family members see further improvement in the children and

<sup>&</sup>lt;sup>10</sup> http://developingchild.harvard.edu/science/key-concepts/serve-and-return/



experience the satisfaction of having increasingly attractive adult-child engagements as partners. In the absence of the stressors from neglectful (or harsh, inconsistent) adult behaviours, the children's development, including and especially their brain development, can proceed positively and optimally.

The One Sky Project recruits and trains local program specialists who then train village-based parent mentors and early childhood teachers to implement its curriculum, emphasizing Responsive Care in caregiver-child interactions. The One Sky Project also upgrades the learning environment by renovating existing village meeting rooms and preschools, equipping them with developmentally appropriate books and toys, using locally-hired labour. The Theory of Change is visualized in **Error! Reference source not found.** 

The purposes of the evaluation is to assess the extent to which the One Sky Project a) changed attitudes and behaviours of parents and caregivers of young children 0-6 and b) improved cognitive and socialemotional development outcomes of targeted children. More specifically, the following evaluation questions will be assessed:

#### Outputs

- To what extend was the program implemented as intended?
  - How did implementation fidelity vary across villages?
  - Participation of parents in family skills training
  - Enrolment in One Sky preschools
  - o Participation in the community engagement activities

#### Outcomes

#### Adult-Child Interaction

- 1. Did the One Sky programme change the interactions of primary caregivers with children aged 0 to 6?
- 2. Did the One Sky programme change the interactions of preschool teachers with children?

Regarding the teacher-child interaction with children of ages 3 to 6, the measured indicators are limited as we only interviewed caregivers, not the teachers. The teachers are surveyed in a separate study. For now, we assume in the analysis that the teachers implement the lessons from the One Sky trainings as intended.

#### Child Development

3. Did the One Sky program affect the development of children between 0 and 6 years old?

2a. Did the family skills component of the One Sky program affect the development of children between 0 and 3 years old?

2b. Did the preschool component of the One Sky program affect the development of children between 3 and 6 years old?

#### 2.2 Survey instruments

In order to answer these questions, the survey measures caregivers' knowledge and practices and child development in five dimensions (physical, social, emotional, cognitive and interpersonal) using existing instruments adapted to the China context. Fieldworkers or caregivers filled in the instruments.

The instruments used to measure caregiver's knowledge and practices are:

• Parenting styles

The parenting styles instrument was taken from the Longitudinal Study of Australian Children (Zubrick et al., 2008) and adjusted to the Chinese context. To determine the parenting style of the caregiver, 22 questions were asked about the behaviour and emotions of the caregiver, which he/she answered on a scale from 1 to 5 (1 means 'never' and 5 means 'always'). Scores can then be calculated to indicate the warmth, consistency, hostility (intervening in the child's behaviour by praise or disagreement) and hostile parenting (negative emotions towards the child resulting in yelling or leaving the child alone) of the caregiver.

• HOME

The Home Observation Measurement of the Environment-Short Form (HOME-SF) is a modification of the HOME inventory as developed by Caldwell and Bradley (1978). The instrument measures parenting behaviour in the domains of emotional support, acceptation, environment support, learning materials (toys and books), parent involvement and family interaction. The scores are based on answers of parents and observations by the enumerators. The score for each domain is the number of questions for which the caregiver gave the preferred answer or for which the enumerator observed the preferred parenting behaviour. This version of the HOME-SF is only suitable for children below three years old.

The following instruments are used to measure child development:

• Ages and Stages Questionnaire (ASQ-3 and ASQ-Social-Emotional)

While the ASQ-3 measures child development in the domains of communication, gross and fine motor, problem-solving skills and personal-social skills, the ASQ-SE measures a total score for

social-emotional development of the child. The instruments are developed by Paul H. Brookes Publishing Co., and have been used by many professionals all over the world<sup>11</sup>. The questionnaires differ by age group (from 6 - 48 months old), but all questions are answered by 'yes', 'sometimes' or 'not yet'. For the ASQ-SE, enumerators also indicate if a specific observation is a concern. Cut-off values are used for each domain to indicate whether the child has a delay in development. This is the case when the child scores below the cut-off value for the ASQ-3, while the ASQ-SE indicates a delay in development if the child scores above the cut-off value. Unfortunately, these cut-off values are intellectual property and cannot be used in this report. Therefore, the scores are presented as percentages of the total score and interpreted as the higher the better for ASQ-3 scores and the lower the better for the ASQ-SE scores.

• Early Human Capability Index (eHCI)

This multidimensional population-based outcome indicator for ECD as developed by Sally Brinkman reports on six domains of children's early development (verbal, approach, culture, socioemotional, perseverance and physical) and provides a snapshot of children's readiness to learn (i.e., their ability to meet the demands of school). The instrument consists of 60 questions about the child's behaviour and skills that can be answered with either 'yes' or 'no'. A higher eHCI represents better progress in child development and the score is bounded between zero and one. The eHCI is only suitable for children between 3 and 6 years old.

In addition to these instruments, the survey includes questions about characteristics of the parents and the child that we use as control variables in the analysis and about the experience of the parents with the program.

#### 2.3 Sampling

Due to issues with the implementation of the project, the sampling method was adjusted since baseline. This section describes the implementation issues and adjustments. The project continues to be implemented as a Randomized Controlled Trial (RCT). Table 1 summarizes the sampling and implementation at village level.

#### 2.3.1 Sampling and implementation of the first round

At baseline, 60 villages (30 intervention villages and 30 control villages) were selected from a list of all villages in Ye county provided by the Education Bureau of Ye County and the Bureau of Civil Affairs<sup>12</sup>. These villages were selected based on stratification by a set of selection criteria (number of children, share of children with needs, number of private pre-school centres and number of public pre-school centres). First, 30 villages were randomly sampled, after which 30 other villages were sampled from the same strata using pairwise matching. Finally, treatment status was randomly assigned within the village pairs.

Unfortunately, many villages did not comply with the treatment assignment. The Family Skills component was launched in November 2015 in a first cohort of eight villages. The Preschool component was launched in nine villages as of March 2016, together with a second cohort of the Family Skills component in 13 villages. In total, there were 21 villages in which the project was implemented, but only nine of those implemented the preschool component. The other villages refused. The main reasons for not implementing the program was a lack of classrooms, as One Sky works together with existing preschools, and a salary that is too low to attract new teachers. However, some village leaders refused the program due to personal reasons.

<sup>&</sup>lt;sup>11</sup> http://agesandstages.com/research-results/success-stories/

<sup>&</sup>lt;sup>12</sup> In total there are 553 villages in Ye county. A few villages were taken out of consideration for sampling due to political reasons.

#### 2.3.2 Sampling and implementation of the second round

In order to reach enough statistical power, the project had to be implemented in other villages, resulting in another implementation round. The Education Bureau of Ye County, the Bureau of Civil Affairs and One Sky selected 40 villages based on the probability that they would implement the program in order to avoid the implementation issues of the first implementation round. These villages were randomly assigned to the treatment or control group. In addition to these 20 new treatment villages, One Sky implemented the program in one of the control villages of the initial baseline sample.

Treatment implementation was more successful in the second round. All 20 treatment villages implemented (part of) the One Sky programme. While 14 villages implemented both the Family Skills component and the preschool component, three only implemented the Family Skills component and three other villages only implemented the preschool component.

#### 2.3.3 Sampling at end line

Due to budget restrictions, we could only include 60 villages in the end line sample. To maximize the use of villages that implemented the programme and the data that is available, we chose to include the 24 villages that implemented the full programme together with 3 first round villages that implemented the Family Skills component and 3 second round villages that implemented the Preschool component. This way, we have 27 villages for each component in the sample. We chose to include the first round Family Skills villages instead of the second round Family Skills villages, because we have more data available for the first round villages. Note that by excluding treatment villages from the analysis that refused to implement (part of) the programme, we create a selection bias (see section 2.4).

We re-matched the treatment villages to control villages based on baseline data because the baseline data contains more information than the data that we used for the original matches before randomization. The villages were matched on the number of children in the village, socio-economic status of the households and development of the children using nearest neighbour matching. In total, we included 30 treatment villages (the first round control villages that received treatment in the second round is treated as a treatment village) and 30 matched controls in the sample.

Note that between the midline and the end line survey, the Government opened parenting centres in two of the control villages. This means that we measure the effect of the One Sky programme relative to having no parenting centre or a parenting centre of the Government.

The implementation is summarized in Table 1.

					First i	impleme	ntation	round					Second	implem	entatio	n round		
Date	Date   Survey   Total   Assigned treatment   Assigned control			Assigned treatment Assigned control														
			Both	Parenting	Preschool	None	Both	Parenting	Preschool	None	Both	Parenting	Preschool	None	Both	Parenting	Preschool	None
August	Х	60				30				30								
2015																		
November		60		8		22				30								
2015																		
March		60	9	12		9				30								
2016																		
July 2016	Х	100	9	12		9				30				20				20
September		100	9	12		9	11			29	14	3	3					20
2016																		
July 2017	Х	60	9	3			11			13	14		3					17
<sup>1</sup> This villag	e was assi	gned to t	he cont	rol group in A	August 2015,	but recei	ved trea	tment in the s	second imple	<sup>1</sup> This village was assigned to the control group in August 2015, but received treatment in the second implementation round. It was considered a treatment village at end line.								

i dore i sumpring und neutronententententententententententententent	Table 1 Sam	pling and	treatment	implementation	at village level
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#### 2.3.4 Final sampling result at the child level

The intention for both baseline surveys was to interview all children between 6 months and 4 years old and their families in the sampled villages. The children that participated in the baseline survey were attempted to follow up in the end line survey to create a panel dataset. In the villages included in the endline sample, 2887 children have baseline values (1298 from 2015 and 1643 from 2016). We aimed to interview all these children again at end line. The end line sample comprises 2362 children, so the attrition rate is 18.2 percent.

It should be noted that, although we aimed to survey all the children in the sampled villages at both baselines, some parents refused to participate in the study and some children were not at home. We do not know the exact number of children missing in the sample, but we do not expect this to be a substantial issue for the analysis.

The survey was conducted by the China Development Research Foundation (CDRF) in collaboration with Henan University.

#### 2.4 Comparison of included and excluded villages

The 30 treatment villages included in this study are a selective group. We selected villages that implemented at least part of the programme, while we excluded villages that refused the programme from the study. This selectivity probably creates a selection bias in the results. This section compares the baseline values of included and excluded treatment and control villages at end line to give insight into the selection of the sample.

Table 2 and Table 3 provide a baseline comparison between included and excluded villages, by their treatment status, at the village and child level respectively. Treatment villages that are included in the study have significantly more children below the age of six, relative to excluded treatment villages and control villages. Interestingly, included treatment villages already had relatively many services for children under the age of six at baseline, including preschools. This suggests that the implementing villages care more about early child development than non-implementing villages.

While the included villages seem to differ from the excluded villages based on village level data, we find only minor differences between the two groups when looking at child level data on gender, height, weight and primary caregiver.

	CONT	ROL		TREATMENT			
	Excluded	Included	p-value	Excluded	Included	p-value	
NUMBER OF HOUSEHOLD S	366.74	362.43	0.93	380.52	426.97	0.29	
	(167.14)	(147.16)		(179.44)	(134.06)		
NUMBER OF CHILDREN UNDER THREE YEARS OLD	52.11	45.07	0.39	47.05	70.33	0.01**	
	(31.58)	(24.75)		(23.13)	(35.74)		
NUMBER OF CHILDREN BETWEEN THREE AND SIX YEARS OLD	64.21	51.80	0.24	58.24	79.23	0.08*	
	(42.84)	(29.97)		(38.62)	(42.25)		

Table 2 Comparing included and excluded villages at end line – baseline village level data

NUMBER OF CHILDREN LEFT- BEHIND UNDER SIX YEARS OLD	41.74	29.87	0.18	47.90	46.83	0.93
	(33.14)	(26.94)		(37.42)	(43.62)	
FRACTION OF VILLAGES WHICH HAVE SERVICES FOR CHILDREN UNDER 6 YEARS OLD	0.47	0.63	0.28	0.24	0.80	0.00***
	(0.51)	(0.49)		(0.44)	(0.41)	
NUMBER OF PRESCHOOLS	0.63	0.63	0.99	0.43	1.03	0.00***
	(0.76)	(0.49)		(0.75)	(0.67)	
FRACTION OF VILLAGES THAT HAVE A PLAYGROUN D	0.05	0.43	0.00***	0.24	0.33	0.47
	(0.23)	(0.50)		(0.44)	(0.48)	
N	19	30		21	30	
0 1 1 1	015 11 1'	2016	1	01		

Source: baseline 2015 and baseline 2016 village leader survey, One Sky Note: as a first round control village is included in the study as a treatment village, with a matched control village, 19 control villages and 21 treatment villages are excluded. Standard deviations between parentheses. \*p < .10, \*\* p < .05, \*\*\* p < .01

Table 3 Comparing included and excluded villages at end line – baseline child level data

		CONTROL		]	REATMENT		
	Excluded	Included	p-value	Excluded	Included	p-value	
FRACTION FEMALE	0.46	0.46	0.790	0.47	0.49	0.308	
	(0.50)	(0.50)		(0.50)	(0.50)		
	[809]	[1,244]		[944]	[1,649]		
HEIGHT (CM)	87.14	86.77	0.509	86.90	87.51	0.440	
· /	(11.11)	(11.36)		(10.96)	(23.90)		
	[802]	[1,229]		[940]	[1,642]		
WEIGHT (KG)	12.61	12.54	0.565	12.53	12.52	0.963	
· · ·	(2.63)	(2.83)		(2.74)	(2.75)		
	[808]	[1,236]		[939]	[1,642]		
PRIMARY CAREGIVER							
MOTHER	0.54	0.54	0.849	0.57	0.56	0.893	
	(0.50)	(0.50)		(0.50)	(0.50)		
	[809]	[1,244]		[944]	[1,649]		
FATHER	0.05	0.07	0.138	0.04	0.06	0.155	
	(0.21)	(0.26)		(0.19)	(0.23)		
	[809]	[1,244]		[944]	[1,649]		
<b>GRANDPARENTS</b>	0.40	0.37	0.417	0.38	0.36	0.613	
	(0.49)	(0.48)		(0.49)	(0.48)		
	[809]	[1,244]		[944]	[1,649]		
Source: baseline 2015 and baseline 2016 caregiver survey, One Sky							

Note: standard deviations between parentheses and sample size between brackets. P-values are corrected for

clustering. \* *p* < .10, \*\* *p* < .05, \*\*\* *p* < .01

#### 2.5 Treatment take-up

Within the treatment villages that implemented the programme, only part of the children were exposed to the project. Table 4 shows that 66 percent of parents living in treatment villages had ever been to the parenting centre, and 34 percent of parents participated in a parenting class in the month before the survey. Furthermore, 51 percent of children that are three years old or above are enrolled in a One Sky preschool and 49 percent of parents has ever taken part in community activities organized by the project.

Although not shown in the table, only few children and caregivers in the control villages were exposed to the program. None of the children in the control villages were enrolled in a One Sky preschool. The data on parenting classes in control villages is missing for 37 percent of the children, but only eight caregivers indicated that they had ever been to a One Sky parenting centre. Data on community activities was not collected in control villages, but it is unlikely that control children and caregivers participated in these activities organized by One Sky because these happen within villages.

Limited treatment take-up in treatment villages reduces the expected impact if we would compare the assigned treatment and control villages. Section 2.7 describes how we deal with this in our identification strategy.

#### Table 4 Treatment take up

	FRACTION	STANDARD DEVIATION	OBSERVATIONS
DO YOU KNOW THAT THERE IS A PARENTING CENTRE IN YOUR VILLAGE?	0.88	0.32	1,224
HAVE YOU EVER BEEN TO THE PARENTING CENTRE IN YOUR VILLAGE?	0.66	0.47	1,220
DID YOU TAKE A PARENTING CLASS IN THE PAST MONTH?	0.34	0.47	1,188
DID YOU TAKE THE CHILD TO THE CENTRE IN THE PAST WEEK?	0.20	0.40	1,196
DOES THE CHILD GO TO A TREATMENT PRESCHOOL? (CHILDREN 3 YEARS OLD OR ABOVE)	0.51	0.50	817
HAVE YOU TAKEN PART IN COMMUNITY	0.49	0.50	1,294

Source: end line caregiver survey 2017, one sky

note: the sample includes 1374 children in treatment villages, of whom 1273 live in villages that implemented the parenting component and 882 children of three years old or above in villages that implemented the preschool component.

#### 2.6 Attrition

As mentioned in section 2.3.4, the attrition rate is 18.2 percent. Attrition would bias the results if it were systematic, i.e. if treatment or certain characteristics affect attrition. Systematic attrition limits the generalizability of the results due to a selection bias.

While the treatment and control group were balanced at baseline on child characteristics, primary caregiver and parent characteristics and wealth (see Appendix 1), we find that attrition is systematic in our sample. Table 5 presents correlations between being included in the end line sample and several child and caregiver characteristics at baseline. The results show that children in the assigned treatment

group are more likely to be included in the end line sample. It could be that the One Sky teachers encouraged the parents to participate in the survey. Moreover, children with relatively highly educated mothers are less likely to be followed up at end line. In addition, the survey team could follow up more relatively wealthy households in terms of assets, although this correlation is only significant at the 10 percent level. The correlations between inclusion in the end line sample and premature birth and grandparents as primary caregivers are also negative. Anecdotal evidence says that many left-behind children visit their parents in the city during summer holidays, when the survey took place.

The results show that the attrition is systematic, so that the treatment and the control group are no longer comparable at end line. The direction of the bias in the results is unclear prior to the analysis, as mother's education is positively correlated with child development while the other indicators are negatively correlated with child development.

	(1)
	Included in end line sample
ASSIGNED TO TREATMENT	0.135**
	(0.056)
AGE IN MONTHS	-0.001
	(0.002)
CHILD WAS BORN PREMATURE	-0.164*
	(0.092)
CHILD IS FEMALE	0.020
	(0.056)
	0.110*
GRANDPARENTS ARE PRIMARY	-0.113
CAREGIVERS	(0.050)
	(0.059)
MOTHED'S EDUCATION IN VEADS	0.041***
MOTHER'S EDUCATION IN YEARS	-0.041
	(0.011)
STANDADDIZED ASSET INDEX	0.051*
STANDARDIZED ASSET INDEX	(0.031)
	(0.050)
CONSTANT	1 251***
CONSTANT	(0.128)
OBSERVATIONS	2754
	2,34

Table 5 Attrition Analysis

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky Note: Model estimated using a probit regression on baseline values. Standard errors in parentheses  ${}^{*}p < .01$ ,  ${}^{**}p < .05$ ,  ${}^{***}p < .01$ 

#### 2.7 Statistical approach

Two observations follow from the previous sections that we address in our identification strategy: limited treatment take-up and systematic attrition. We use lagged dependent variable regression as our base methodology, and we apply an instrumental variable and propensity score matching approach to deal with treatment take-up and systematic attrition respectively.

#### 2.7.1 Regression with lagged dependent variable

The estimation model for the lagged dependent variable approach can be defined as follows for individual i from village v in time t:

$$y_{i,\nu,1} = \beta_0 + \beta_1 T_{\nu} + \beta_2 y_{i,\nu,0} + \gamma_1 X_{i,\nu,t} + \varepsilon_{i,\nu,t}$$
(1)

where y is the outcome indicator of interest at end line on the left-hand side and at baseline, the lagged dependent variable, on the right-hand side. T is a dummy constant for the treatment status, which is one for children who live in a treatment village. X is a vector of child and parent characteristics that are likely to correlate with T and y and need to be controlled for. The control variables used are dummy variables for the ASQ-3 age group at end line<sup>13</sup>, the gender of the child, the baseline value of an asset index, the number of months that the mother and father spend at home in the year before the baseline survey, the number of years of education of the mother and the baseline round (2015 or 2016). The final term, epsilon, is the residual or error term. The standard errors are controlled for clustering at the village level.

For interpretation purposes, we standardize the parenting and child development variables using the end line mean and standard deviation of the control group. The coefficient of interest,  $\beta_1$ , shows the Intent-to-Treat (ITT) effect, as part of the children and caregivers in the treatment group were not treated. In this model, the ITT effect is the difference in the outcome variable between the treatment and the control group at end line in terms of control group standard deviations, while controlling for the baseline value of the outcome variable.

#### 2.7.2 Instrumental variables to correct for limited treatment take-up

However, as not all eligible children in the treatment villages participated in the program, this method will underestimate the actual treatment effect on the treated children. Using an indicator for realized treatment status has endogeneity issues following from a selection effect, since parents chose not to participate the program. The solution to the endogeneity is to use Instrumental Variables (IV). An IV estimation is done in two stages. In the first stage the endogenous variable is regressed on the exogenous instrument. These are, in this case, a dummy for being exposed to the program and a dummy for the assigned treatment status respectively. Of those assigned to the treatment group, 79 percent was exposed to the program (ever been to the parenting centre, enrolled in One Sky preschool or ever participated in community engagement projects). The first stage of the IV estimation, in which the indicator of interest is estimated using the instrument, can be modelled as follows:

$$I_{i,v} = \beta_0 + \beta_1 T_v + \beta_2 y_{i,v,0} + \gamma_1 X_{i,v,t} + \varepsilon_{i,v,t}$$
(2)

where  $I_{i,v}$  is a dummy for the realized treatment status of child *i* from village *v*. From this regression follows  $\widehat{I_{i,v}}$ ; the predicted probability for child i of being exposed to the treatment between baseline and endline. These predicted values are used in the second stage as the treatment indicator. This second stage estimates the same model as shown in Equation 1, but the treatment indicator is replaced with the predicted treatment estimator.

$$y_{i,v,1} = \beta_0 + \beta_1 \widehat{I_{i,v}} + \beta_2 y_{i,v,0} + \gamma_1 X_{i,v,t} + \varepsilon_{i,v,t}$$
(3)

This way, we estimate the impact of the treatment probability on the outcome indicators. By estimating the treatment effect using the realized treatment, this model estimates the Local Average Treatment Effect (LATE) or the treatment effect for those who complied with the treatment status.

<sup>&</sup>lt;sup>13</sup> The ASQ-3 test differs by age group, while the other instruments do not. The age groups are around 18 months (17 months, 0 days through 18 months, 30 days), 20 months (19 months, 0 days through 20 months, 30 days), 22 months (21 months, 0 days through 22 months, 30 days), 24 months (23 months, 0 days through 25 months, 15 days), 27 months (25 months, 16 days through 28 months, 15 days), 30 months (28 months, 16 days through 31 months, 15 days), 33 months (32 months, 16 days through 34 months, 15 days), 36 months (34 months, 16 days through 38 months, 30 days), 42 months (0 days through 44 months, 30 days), 48 months (45 months, 0 days through 50 months, 30 days), 54 months (51 months, 0 days through 56 months, 30 days) and 60 months (57 months, 0 days through 62 months, 30 days).

#### 2.7.3 Matching to control for systematic attrition

In order to deal with (systematic) attrition, we apply matching using the Inverse Probability Weighting (IPW) approach. This approach weighs observations based on their propensity score, which is the estimated probability of being observed based on characteristics. By reweighting the observations, we try to estimate what the effect would have been without attrition. We match the children based on the baseline values of the total parenting style score, total ASQ-3 score and total ASQ-SE score, ASQ-3 age group at end line, gender, mother's education, the baseline asset index, the number of months that the mother and father spend at home in the year before the baseline survey and the baseline round (2015 or 2016). We do not show these results, because the differences with the ITT and LATE effects are small. The largest difference that we find is 0.007 standard deviation. Results are available on request.

#### 2.7.4 Heterogeneous treatment effects

We will also identify heterogeneous treatment effects, necessary given the diversity of the sample population. We analyse separate effects for children in the first and second implementation wave, for the parenting and preschool component, for girls and boys and for left-behind children and children living with at least one of their parents.

# 3 Descriptive results

Before describing the regression results, we provide descriptive results on the experiences of parents with the programme and on parenting and child development.

#### 3.1 Parent's experience

Results on the views and experiences of parents at the parenting centres, preschools and community activities are presented in Appendix 2. This section summarizes those results to show how the programme was received by the parents, and to understand what we measure with the treatment indicator.

Of those parents who know about the parenting centre, 73 percent ever visited. When they visited, 59 percent stayed there for an hour or longer. They visit the centre 1.5 times per week on average. Most participants indicate that they go to the centre to let their children play with toys (94%) or to attend lectures (57%). On average, they participated in two lectures in the last month. Fifteen percent says that they never listened to the lectures, but 80 percent finds it at least a little bit helpful. Of the participants, 78 percent uses what they learn in the centre at home.

The children that are enrolled in a One Sky preschool go there five days a week for eight hours a day on average. The parents indicate that they pay 208 yuan per month<sup>14</sup> for school fees, but this amount is inconsistent across enrolled children with a standard deviation of 111 yuan. Eighty-nine percent of the parents receives information on their child's development, on average three times per semester. Compared with parents of enrolled children at other preschools in both treatment and control villages, more parents of enrolled children at One Sky preschools were invited into the classrooms by the teacher to explain his or her teaching method (44% and 63% respectively). In addition, at One Sky schools, more parents noticed creations of their children enrolled in One Sky preschools are more involved in WeChat groups that bring together parents of children from the same class (72% compared with 63% in other schools). One Sky teachers provided information through this medium about their lessons and the children 2.2 times on average in the last semester, while other teachers did this 0.5 times. Despite

<sup>&</sup>lt;sup>14</sup> 30.78 USD based on the average exchange rate in 2017 of 0.148 USD per yuan (https://www.oanda.com/currency/average)

these differences, only 4 percent of parents involved with One Sky preschools notice that One Sky preschools are different from other preschools.

Of the 49 percent of parents that takes part in community activities, 30 percent does that at least once a week. The participants are mostly aware of the activities at the parenting centre (73%) or at the village square (55%). Ninety-four percent thinks that the activities are helpful for them and their child.

#### 3.2 Parenting skills and child development

This section provides descriptive results for parenting skills and child development. We construct an overall parenting indicator using the parenting style items. Each item is answered on a scale from one to five. We calculate a total score by adding up the answers for each item in the domains of warmth, consistency and hostile parenting, after which we take the total score as a percentage of the maximum score. The parenting indicator is this score, standardized using the mean and standard deviation of the control group at end line as used in the regression analysis. Figure 3 presents the standardized parenting score at baseline and end line by treatment group. It shows that the trend in parenting for the assigned control villages was flat, while it improved in the assigned treatment villages. In the regression analysis we measure the difference between the treatment and control group at end line, while controlling for the baseline value of the score. Parenting in treatment villages improved with almost 0.15 standard deviation.

The graph also shows the trend for those children and parents that were exposed to the project through the parenting centre, the preschool or community activities. As expected, the trend is steeper for this group.





For child development, we construct an indicator based on the ASQ-3 that is calculated by the total score as a percentage of the maximum score. Also this score was standardized using the mean and standard deviation of the control group at end line. As illustrated in Figure 4, the trend for child development was also steeper in the treatment villages compared with the control villages, while children in these villages started at the same level of development. Treatment children gained almost 0.4 standard deviation in development and control children gained 0.2 standard deviation. The indicator is not corrected for age, so the positive trend in the control group shows that apparently the test gets easier with age. The exposed children developed most between the baseline and end line survey.



#### Figure 4 Descriptive result for child development

These descriptive results suggest that the programme had a positive impact and that limited implementation causes underestimation of the results. However, the positive effect could still be due to a selection bias through systematic attrition, which is addressed in the next section.

#### 4 Regression results

This section dives deeper into the results, which we correct for limited implementation and attrition, and suggests that the descriptive results are underestimations of the actual effect of the One Sky programme. The tables present the results for the ITT, LATE and ATET. The row 'controls' indicates whether controls were included in the regression. All results are standardized using the mean and standard deviation of the control group at end line. The non-standardized values of the outcome indicators are presented in Appendix 3.

The next paragraphs follow the theory of change by first showing the effect of the programme on parenting and parent's perception of the preschools and finally showing the effect the child development.

#### 4.1 Parenting

#### 4.1.1 Parenting styles

The project tries to improve parenting skills of parents of children below three years old. The table below includes all surveyed children, as all of them were three years or younger at baseline and thus were potentially exposed to the project. We find an impact on warmth, hostility and, in turn, on the total parenting score. Warm parenting reflects involvement of the parent with the child. We find similar treatment effects for the three different methods of between 0.2 and 0.3 standard deviation. For hostility, we find a positive effect of about 0.1 standard deviation, but this is only significant at the 10 percent level. This means that parents were better able to manage their child. The results for the total parenting score show that the difference found in Figure 3 is significant at the five percent level, and the effect is between 0.1 and 0.2 standard deviation. Note that parenting skills are difficult to measure, in particular when they are self-reported by the parents. Hence, it is difficult to determine what this effect means in practice.

Table 6 Parenting Styles

(1)	(2)	(3)	(4)	(5)	(6)

	W	armth	Consistency		<b>Hostile Parenting</b>		
	ITT	LATE	ITT	LATE	ITT	LATE	
TREATMENT EFFECT	0.210***	0.265***	0.069	0.087	-0.004	-0.005	
	(0.050)	(0.061)	(0.057)	(0.070)	(0.067)	(0.083)	
		· · · ·		· · · ·			
LAGGED DEPENDENT VARIABLE	0.089***	0.090***	0.082***	0.081***	0.056***	0.056***	
	(0.024)	(0.023)	(0.019)	(0.018)	(0.019)	(0.019)	
CONSTANT	0.122	0.131	-0.263	-0.260	-0.246	-0.247	
	(0.187)	(0.187)	(0.224)	(0.220)	(0.240)	(0.237)	
		· /		· /		. ,	
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes	
OBSERVATIONS	2129	2129	2129	2129	2129	2129	
	He	ostility	Total				
	ITT	LATE	ITT	LATE			
TREATMENT EFFECT	0.126*	0.155*	0.134**	0.169**			
	(0.072)	(0.087)	(0.063)	(0.077)			
LAGGED DEPENDENT VARIABLE	0.096***	0 094***	0 103***	0 103***			
VARIABLE	(0.034)	(0.0)4	(0.103)	(0.020)			
	(0.034)	(0.055)	(0.020)	(0.020)			
CONSTANT	-						
	0.920***	0.385**	-0.228	-0.223			
	(0.178)	(0.157)	(0.228)	(0.224)			
CONTROLS	Yes	Yes	Yes	Yes			
OBSERVATIONS	1190	1190	2129	2129			

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky Note: Hostility is only relevant to caregivers of children that are 2 years old or above, and is excluded from the total score. Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, the ASQ age group and the baseline round.

 $p^* p < .10, p^* < .05, p^* < .01$ 

#### 4.1.2 HOME

Another way to measure parenting skills is with the HOME short-form. The HOME short-form was only collected at end line. This means that we cannot include the lagged dependent variable. This version of the HOME short-form is only suitable for children below three years old, so Table 7 includes a smaller number of children than the previous table about parenting styles.

We find the largest effect for interaction with the family of 0.3 standard deviation. This domain includes for instance time spend with the father and activities with the whole family. Surprisingly, we do not

find a significant effect on parent involvement. This domain focuses more on the primary caregiver and his or her interaction with the child using toys.

	(1)	(2)	(3)	(4)	(5)	(6)
	Emotior	nal Support	Acce	eptation	Environm	ent Exposure
	ITT	LATE	ITT	LATE	ITT	LATE
TREATMENTEFFECT	0.141	0.192	-0.093	-0.127	0.012	0.016
	(0.112)	(0.150)	(0.110)	(0.148)	(0.083)	(0.111)
CONSTANT	-0.260	-0.246	-0.558**	-0.567**	-0.819***	-0.817***
	(0.284)	(0.275)	(0.261)	(0.256)	(0.307)	(0.303)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes
OBSERVATIONS	691	691	679	679	656	656
	Learning n	naterials/Toys	<b>Parent Involvement</b>		Interaction with Family	
	ITT	LATE	ITT	LATE	ITT	LATE
TREATMENTEFFECT	0.133	0.182	0.043	0.059	0.250***	0.343***
	(0.091)	(0.121)	(0.087)	(0.116)	(0.090)	(0.121)
CONSTANT	-0.998***	-0.982***	-0.707**	-0.702**	-1.148***	-1.124***
	(0.286)	(0.279)	(0.340)	(0.329)	(0.273)	(0.268)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes
OBSERVATIONS	663	663	662	662	679	679

#### Table 7 HOME

Source: end line 2017 caregiver survey, One Sky

Note: Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, the ASQ age group and the baseline round. \* p < .10, \*\* p < .05, \*\*\* p < .01

#### 4.2 Satisfaction with preschool

Ideally, we would like to assess whether the project had any impact on teaching methods of the teachers, as this is the main intervention at the preschool level. Since we do not have this information, we analyse the second-best option, which is the opinion of the parents. Parents of children enrolled in any preschool were asked to rate the building, toys and books and the teachers. Table 8 presents the results for parents of children who were already enrolled in preschool at baseline, because we need a baseline value of the dependent variable for our method. Note that this group is small, as children can only enrol when they are over three years old.

We find consistent positive effects across the methods for the score of the building, toys, books and the teachers. The parents score the building about half a point higher, toys and books almost one point higher, and the teachers half a point higher. The parents seem to like the interior and toys that One Sky provided and they seem to notice a positive change in the teachers.

	(1)	(2)	(3)	(4)
	Preschool provident	rovides information oment of the child	Score	building (0-10)
	ITT	LATE	ITT	LATE
TREATMENT EFFECT	-0.010	-0.013	0.498**	0.599***
	(0.043)	(0.051)	(0.190)	(0.227)
LAGGED DEPENDENT VARIABLE	0.086**	0.085**	0.202***	0.202***
	(0.040)	(0.039)	(0.044)	(0.044)
CONSTANT	0.820***	0.633***	5.451***	5.628***
	(0.124)	(0.108)	(1.183)	(0.647)
CONTROLS	Yes	Yes	Yes	Yes
ODSEDVATIONS				
OBSERVATIONS	338	338	335	335
	Score toys	and books (0-10)	Score	teachers (0-10)
	ITT	LATE	ITT	LATE
TREATMENT EFFECT	0.771***	0 971***	0.498*	0 603**
	(0.220)	(0.262)	(0.251)	(0.296)
	(0.220)	(0.202)	(0.231)	(0.290)
LAGGED DEPENDENT VARIABLE	0.247***	0.248***	0.277***	0.276***
	(0.054)	(0.054)	(0.049)	(0.049)
CONSTANT	6.107***	5.932***	6.929***	6.282***
	(0.708)	(0.620)	(0.925)	(0.637)
CONTROLS	Yes	Yes	Yes	Yes
OBSERVATIONS	333	333	334	334

#### Table 8 Preschool satisfaction

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky Note: Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, the ASQ age group and the baseline round. \* p < .10, \*\* p < .05, \*\*\* p < .01

#### 4.3 Child development

In the previous sections, we found positive effects of the One Sky programme on parenting skills and parents' perception of the preschools. This section analyses whether the programme also improved child development by looking at several measurements.

#### 4.3.1 Ages and Stages

We present the results for ASQ-3 in Table 9 and the results for ASQ-SE in Table 10. We find positive and significant effects for both instruments.

The descriptive result for the total ASQ-3 score was plotted in Figure 4 before. The coefficients in this table show similar results. While the descriptive result suggested an effect of 0.15 standard deviation,

we find an effect between 0.16 and 0.19 standard deviation when controlling for covariates, limited treatment take-up or attrition. Effects on the gross-motor and personal-social domains drive the effect on the total score.

#### Table 9 ASQ-3

	(1)	(2)	(3)	(4)	(5)	(6)
	Con	nmunication	Gro	ss-motor	Fine	-motor
	ITT	LATE	ITT	LATE	ITT	LATE
TREATMENT EFFECT	0.060	0.076	0.126**	0.158**	0.112	0.140
	(0.061)	(0.076)	(0.060)	(0.075)	(0.070)	(0.086)
LAGGED DEPENDENT VARIABLE	0.164***	0.164***	0.145***	0.146***	0.151***	0.150***
	(0.033)	(0.032)	(0.026)	(0.026)	(0.025)	(0.025)
CONSTANT	-1.322***	-1.320***	-0.152	-0.147	-0.303	-0.299
	(0.228)	(0.224)	(0.271)	(0.268)	(0.229)	(0.225)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes
OBSERVATIONS	2123	2123	2126	2126	2106	2106
	Prol	blem-solving	Personal-social		Tota	1
	ITT	LATE	ITT	LATE	ITT	LATE
TREATMENT EFFECT	0.106	0.133	0.156***	0.197***	0.155**	0.194**
	(0.069)	(0.085)	(0.057)	(0.070)	(0.071)	(0.087)
LAGGED DEPENDENT VARIABLE	0.109***	0.109***	0.149***	0.148***	0.286***	0.286***
	(0.028)	(0.028)	(0.026)	(0.026)	(0.038)	(0.038)
CONSTANT	-0.679***	-0.675***	-0.351*	-0.345*	-0.649***	-0.643***
	(0.215)	(0.210)	(0.191)	(0.185)	(0.237)	(0.232)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes
OBSERVATIONS	2118	2118	2126	2126	2126	2126

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky Note: Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, the ASQ age group and the baseline round. \* p < .10, \*\* p < .05, \*\*\* p < .01

We find a positive effect of the programme on the ASQ-SE (the lower the better) using the two different methods. The effect is 0.1 standard deviation.

#### Table 10 ASQ-SE

 (1)	(2)
ASQ S	ocio-Emotional
ITT	LATE

TREATMENT EFFECT	-0.077*	-0.097*
	(0.041)	(0.051)
LAGGED DEPENDENT VARIABLE	0.154***	0.154***
	(0.037)	(0.036)
CONSTANT	-0.115	-0.119
	(0.095)	(0.094)
CONTROLS	Yes	Yes
OBSERVATIONS	2098	2098
Source: baseline 2015, baseline 2016 and end line 2017	caregiver sur	vey, One Sky

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky Note: Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, the ASQ age group and the baseline round. \* p < .10, \*\* p < .05, \*\*\* p < .01

#### 4.3.2 eHCI

We also measured child development using the eHCI. Recall that this instrument is only suitable for use on children that are three years old or above. Therefore, the sample comprises 523 children who had eHCI values both at baseline and end line.

The results on the domains and readiness to learn are presented in Table 11 and Table 12. Only for the cultural knowledge domain (identifying animals, food, and cultural routines such as prayers) and for the physical domain, we find positive significant results in the panel of about 0.2 standard deviation. Although we do not find an ITT for approach to learning, the LATE is significant. The effect on total development (including numeracy, reading and writing) of about 0.2 standard deviation is consistent with the findings for the ASQ.

Turning to readiness to learn, we find a positive effect of around 0.2 standard deviation for writing, but no effect on overall readiness to learn.

	(1)	(2)	(3)	(4)	(5)	(6)
	V	erbal	Approach	to learning	Cultural knowledge	
	ITT	LATE	ITT	LATE	ITT	LATE
TREATMENT EFFECT	0.077	0.098	0.197	0.250*	0.193**	0.245**
	(0.093)	(0.116)	(0.118)	(0.149)	(0.086)	(0.108)
LAGGED DEPENDENT VARIABLE	0.078	0.077	0.096	0.096	0.058	0.059*
	(0.064)	(0.063)	(0.069)	(0.068)	(0.036)	(0.035)
CONSTANT	0.773***	0.101	-0.654***	-0.006	0.681***	0.033
	(0.246)	(0.149)	(0.229)	(0.149)	(0.205)	(0.168)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes
OBSERVATIONS	523	523	523	523	522	522

	Socio-e	emotional	Persev	erance	Phys	ical
	ITT	LATE	ITT	LATE	ITT	LATE
TREATMENT EFFECT	0.093	0.118	0.003	0.004	0.187**	0.237**
	(0.087)	(0.108)	(0.071)	(0.088)	(0.085)	(0.104)
LAGGED DEPENDENT VARIABLE	0.162***	0.161***	0.091**	0.091**	0.109**	0.108**
	(0.047)	(0.046)	(0.040)	(0.039)	(0.045)	(0.044)
CONSTANT	1.157***	0.232	0.617***	0.076	1.004***	0.185
	(0.243)	(0.196)	(0.213)	(0.155)	(0.197)	(0.208)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes
OBSERVATIONS	523	523	521	521	523	523
				-		
	Overall Developmen					
			ITT	LATE		
TREATMENT EFFECT			0.160**	0.203**		
			(0.064)	(0.079)		
LAGGED DEPENDENT VARIABLE			0.217***	0.215***		
			(0.051)	(0.051)		
CONSTANT			1.828***	0.643***		
			(0.192)	(0.151)		
CONTROLS			Yes	Yes		
OBSERVATIONS			523	523		

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky Note: Overall development includes numeracy, reading and writing. Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, the ASQ age group and the baseline round. \* p < .10, \*\* p < .05, \*\*\* p < .01

Table 12 eHCI - readiness to learn

	(1)	(2)	(3)	(4)	(5)	(6)
	Nu	meracy	R	Reading		riting
	ITT	LATE	ITT	LATE	ITT	LATE
TREATMENT EFFECT	0.023	0.029	0.014	0.018	0.155*	0.198**
	(0.057)	(0.071)	(0.062)	(0.076)	(0.078)	(0.098)
LAGGED DEPENDENT VARIABLE	0.140***	0.140***	0.181***	0.181***	0.178***	0.170***
	(0.035)	(0.034)	(0.039)	(0.038)	(0.047)	(0.046)

CONSTANT	-0.293*	0.520***	1.360***	0.451***	1.955***	0.773***
	(0.174)	(0.125)	(0.152)	(0.157)	(0.188)	(0.160)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes
OBSERVATIONS	523	523	522	522	523	523
			Overall n li	umeracy and teracy		
			ITT	LATE		
TREATMENT EFFECT			0.048	0.061		
			(0.057)	(0.070)		
LAGGED DEPENDENT VARIABLE			0.223***	0.222***		
			(0.037)	(0.036)		
CONSTANT			0.260	0.715***		
			(0.163)	(0.125)		
CONTROLS			Yes	Yes		
OBSERVATIONS			523	523		

baseline 2015, baseline 2016 and caregiver end line 2017 Sky Source: survey, One Note: Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, the ASQ age group and the baseline round. \* p < .10, \*\* p < .05, \*\*\* p < .01

#### 4.4 Robustness checks

#### 4.4.1 Results by implementation round

1

In the analysis in the previous sections, we did not distinguish between the two implementation rounds. This means that part of the treatment children were exposed to the programme for 16 to 20 months, while the other part was only exposed to the programme for 10 months. We separate the results by implementation round by interacting the treatment effect with a dummy variable for the second implementation round in the ITT analysis, and by running the regressions separately for both implementation rounds in the LATE analysis. The results are presented in Appendix 4. We only do this for the parenting styles and the ASQ, because the other instruments are only used with children below or above the age of three. The children in the second implementation round are younger than the children in the first round, so the sample sizes of children below and above the age of three differ between the implementation rounds.

We find that the positive treatment effect is mainly found for the children in the first implementation round, who received 6 or 10 more months of treatment (see section 2.3.3). The effect on the total parenting score is 0.3 standard deviation for the first round children, with positive effect on all but the hostile parenting component, and the effect on the ASQ-SE is 0.2 standard deviation, while the second round children experienced no effect yet. The ITT effect for the second round children is significantly lower for hostility and for the ASQ socio-emotional. There is no clear difference between the two groups

on the ASQ-3 components. For warm parenting, and the gross-motor and personal-social domains of the ASQ, we find a positive effect between 0.1 and 0.2 standard deviation for the second round children.

#### 4.4.2 Results for parenting classes and preschool separately

The analysis in the previous sections does not distinguish between the parenting and preschool components either. We attempt to find results for the interventions separately by splitting the sample. To measure the effect of the parenting component, we focus on children who are younger than three years old at end line (n=694). They cannot have been exposed to the preschool intervention yet. We apply the same method on this sample as we did on the full sample, but now using a dummy variable for having ever visited the parenting centre as actual treatment in the IV analysis instead of exposure to any part of the programme. The results are presented in Appendix 5. Looking at the parenting styles, we find similar effects on warmth as we find on the whole sample, but the positive effect on the total score is not significant. Recall that the HOME results in Table 7 were reported for children under the age of three already. We find little effect on the child development outcomes, only the effect of 0.2 to 0.3 standard deviation on the gross-motor component is consistently significant, but most coefficients are positive. The oldest children in this sample were one (first wave) or two (second wave) years old at baseline and it is difficult to accurately measure the development of a child at that age, which might explain the findings.

To measure the effect of the preschool component, we focus on children who are four years old or above at end line (n=1023), so that they could have attended preschool for at least a year. We apply the same method on this sample as we did on the full sample, but now using enrolment in a One Sky preschool as actual treatment in the IV analysis. Note that the children between four and five years old could also have participated in the parenting classes during the study period. Those children between four and five who are enrolled in a One Sky preschool are more likely to have been exposed to the parenting component as well than children from other preschools, so that the effect that we measure here might not isolate the preschool effect completely. Appendix 6 shows the results. The LATE effect on the ASQ 3 domains is larger than when applied to the whole sample, but the effect on gross-motor skills and the total score is no longer significant. The effect on ASQ socio-emotional, however, is larger and still significant (ITT of 0.2 standard deviation, LATE of 0.4 standard deviation). The eHCI results are similar to the results for the whole sample, although the LATE treatment coefficients are larger.

That LATE coefficients are larger when using One Sky preschool enrolment as actual treatment rather than exposure to any component of the programme (ever been to the parenting centre, participated in community activities or enrolled in One Sky preschool), could mean that the positive results are driven by the preschool component. However, we are careful with this conclusion, as the development of children above four years old is likely to be more accurately measured.

#### 4.5 Sub-group analysis

#### 4.5.1 Gender

The results for girls and boys are similar, but we find three clear gender differences. First, the treatment effect on interaction with family as measured by the HOME test is more than twice as large for boys (ITT is 0.35 standard deviation for boys, 0.12 for girls). Second, there is a positive effect on hostility for boys of 0.28 standard deviation (ITT), but zero effect for girls. Third, the ITT effect on fine motor skills as measured by ASQ-3 0.25 standard deviation for girls but zero for boys. These differences are difficult to explain. The score for interaction with family is larger for girls in both the treatment and the control group, so the opportunity to improve was larger for boys. The improvement in fine motor skills by girls could be due to girls benefiting more from the project, but this is difficult to prove. Results are available on request.

#### 4.5.2 Left-behind

The programme targeted an area in which a large part of the children is left-behind. The official definition for being left behind is that either mother or father has not lived at home for at least 6 months in the past year. Following that definition, 48.4 percent of the children in our sample were left-behind at baseline. In order to analyse what the impact is of the programme on left-behind children specifically, we compare the treatment effect on left-behind children with the effect on other children. Table 13 shows whether treatment take-up in assigned treatment villages was different among left-behind children. We only find that left-behind children are 6.3 percentage points less likely to have ever been at the parenting centre. Of the other children, 76.3 percent has ever been at the parenting centre at end line, so this difference is small.

	(1)	(2)	(3)	(4)
	Exposed to the programme	Ever been to the parenting centre	Enrolled in One Sky preschool	Participated in community activities
CHILD LEFT-BEHIND AT BASELINE	-0.031	-0.063**	0.018	-0.026
	(0.029)	(0.030)	(0.050)	(0.033)
CONSTANT	$0.806^{***}$	0.763***	0.437***	0.502***
	(0.020)	(0.022)	(0.051)	(0.032)
OBSERVATIONS	1372	1108	941	1292

Table 13 Treatment take-up of left-behind children in treatment villages

Source: end line caregiver survey, 2017, One Sky. A child had been exposed to the programme if he/she had ever been at the parenting centre, is enrolled in a One Sky preschool or participated in community activites. Standard errors in parentheses and corrected for clustering at the village level. \* p < .01, \*\* p < .05, \*\*\* p < .01

The left-behind children are older and poorer than children living with at least one of the their parents. While their parents have attained more years of education, their primary caregiver has attained less years of education. Despite the age difference, there are small but significant differences between the two groups for some parenting and child development outcomes when controlling for age. Caregivers of left-behind children score lower on hostility, and the left-behind children are less developed according to eHCI in general and according to the ASQ in the domain of personal-social skills.

	(TOTAL)	(MIGRATED)	(NOTMIGRATED)	<b>(P)</b>
AGE IN MONTHS	27.51	29.52	25.63	
	(11.98)	(11.29)	(12.31)	
	[2,887]	[1,398]	[1,489]	
ASSET INDEX	-0.08	-0.30	0.12	0.000***
	(1.01)	(0.95)	(1.01)	
	[2,879]	[1,395]	[1,484]	
YEARS OF EDUCATION				
PRIMARY CAREGIVER	7.40	7.04	7.74	0.000***
	(3.06)	(3.18)	(2.90)	
	[2,867]	[1,387]	[1,480]	
MOTHER	8.33	8.36	8.29	0.155
	(2.56)	(2.52)	(2.59)	
	[2,764]	[1,295]	[1,469]	
FATHER	8.41	8.46	8.37	0.080*
	(2.38)	(2.38)	(2.38)	
	[2,826]	[1,349]	[1,477]	

#### Table 14 Characteristics of left-behind children

Source: baseline caregiver survey, 2017, One Sky. Standard deviations in parentheses. P-value is corrected for age and clustering at the village level. \* p < .10, \*\* p < .05, \*\*\* p < .01

	(TOTAL)	(MIGRATED)	(NOTMIGRATED)	<b>(P)</b>
WARMTH	0.71	0.71	0.72	0.181
	(0.08)	(0.09)	(0.08)	
	[2,887]	[1,398]	[1,489]	
CONSISTENCY	0.62	0.62	0.62	0.740
	(0.10)	(0.10)	(0.10)	
	[2,887]	[1,398]	[1,489]	
HOSTILE PARENTING	0.60	0.60	0.60	0.497
	(0.12)	(0.12)	(0.12)	
	[2,887]	[1,398]	[1,489]	
HOSTILITY	0.62	0.61	0.62	0.037**
	(0.08)	(0.08)	(0.08)	
	[1,712]	[926]	[786]	
TOTAL PARENTING STYLE	0.65	0.65	0.65	0.116
	(0.06)	(0.06)	(0.06)	
	[2,887]	[1,398]	[1,489]	
ASQ3 - COMMUNICATION	0.83	0.84	0.82	0.475
	(0.20)	(0.19)	(0.21)	
	[2,887]	[1,398]	[1,489]	
ASQ3 – GROSS MOTOR	0.86	0.87	0.85	0.586
	(0.19)	(0.18)	(0.19)	
	[2,887]	[1,398]	[1,489]	0.500
ASQ3-FINE MOTOR	0.76	0.75	0.77	0.509
	(0.23)	(0.23)	(0.23)	
AGO2 BRODI EMGOLVING	[2,887]	[1,398]	[1,489]	0.050
ASQ3-PROBLEMISOLVING	0.79	0.79	0.79	0.856
	(0.19)	(0.18)	(0.20)	
ASO2 DEDSONAL SOCIAL	[2,887]	[1,398]	[1,489]	0.002***
ASQ3-PERSONALSOCIAL	(0.10)	(0.18)	(0.19)	0.003
	[2 887]	[1 208]	[1 480]	
4503 TOTAI		[1,598]	[1,409]	0.271
ASQ5-TOTAL	(0.13)	(0.13)	(0.14)	0.271
	[2 887]	[1 398]	[1 489]	
ASO SE	0.09	0.09	0.09	0.421
	(0.05)	(0.06)	(0.05)	0.121
	[2.887]	[1,398]	[1,489]	
EHCI-OVERALL LITERACY AND NUMERACY	0.42	0.41	0.43	0.059*
	(0.20)	(0.20)	(0.19)	
	[846]	[466]	[380]	
EHCI-OVERALL DEVELOPMENT	0.63	0.62	0.64	0.016**
	(0.13)	(0.13)	(0.12)	
	[846]	[466]	[380]	
	0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	•	1 1 1 1 1 0	1

#### Table 15 Parenting and development at baseline of left- behind children

Source: baseline caregiver survey, 2017, One Sky. Standard deviations in parentheses. P-value is corrected for age and clustering at the village level. \* p < .10, \*\* p < .05, \*\*\* p < .01

By comparing left-behind children with children living with at least one parent, we find that the effect on the parenting styles is not different for left-behind children. However, the effect on the problemsolving domain of ASQ-3 is significantly larger for non-left-behind children (ITT 0.2 standard deviation, but zero for non-left-behind children) and the coefficient for left-behind children is negative but insignificant relative to the coefficient for non-left-behind children on all other domains of the ASQ-3. These results suggest that the programme was more effective at improving child development for children with at least one parent at home, and that factors other than the measured parenting domains are holding back the impact on the development of left-behind children. Results are available on request.

## 5 Conclusion

This report presents the evaluation of the One Sky programme. The programme aims to improve adultchild interaction by training parents and preschool teachers. In addition, it organizes community activities to engage the villagers with the development of their children. The theory of change of the programme is based on the 'serve-and-return' principle, that posits that the child's developmental status gradually improves as family caregivers respond to children with warmth, sensitivity, consistency and rich language in their interaction. The programme is implemented in Ye County, Henan province, which is a poor rural area with a high proportion of left-behind children between 0 and 6 years old.

The One Sky programme was initially implemented as a Randomized Controlled trial, with 30 assigned treatment and 30 control villages in 2015. However, nine villages refused to implement the programme and 12 villages could only implement the family skills component. To increase statistical power, we added 20 treatment and 20 control villages to the study in 2016, but the budget in 2017 only allowed for 60 villages. We selected 24 treatment villages that implemented all interventions, three villages that only implemented the parenting component and three villages that only implemented the preschool component and we re-matched these to 30 control villages. Besides non-compliance to the treatment assignment, we also encountered systematic attrition of 18.2 percent.

Despite the non-compliance at the village level, treatment take-up was satisfactory. The parents participated in two lectures in the last month on average, and 76 percent applies what they learned. Of children above three years old, 50 percent is enrolled in a One Sky preschool and 49 percent of the parents participated in community engagement activities. Most parents thought that the parenting classes and the community activities were useful, but only few noticed that the One Sky preschools were different from others.

We present the results of a lagged dependent variable analysis, reporting the Intent-to-Treat effect and the Local Average Treatment Effect. The LATE is estimated using Instrumental Variable analysis to correct for the limited treatment take-up. We find positive effects of the programme on warm parenting (0.2 standard deviation) and interaction with family (0.3 standard deviation). Given the focus of the programme on adult-child interaction, the results are in accordance with the expectation of most impact on these domains. We also find that the parents' score for building, toys, books and teachers is larger in treatment preschools than in control preschools.

Turning to child development, we find a positive effect on ASQ of 0.2 standard deviation on the total ASQ-3 score, in particular on the domains of gross-motor and personal-social skills, and of 0.1 standard deviation on ASQ-SE. For the eHCI, we find an effect of 0.2 standard deviation on the total score, mainly through a positive effect on the cultural knowledge and physical domains. The programme also improved readiness to learn of the children above three years old through enhancing their writing skills. Hence, the effect on parenting was concentrated in the interaction domains, and the effect on child development is mainly found in social and physical domains. The effects are consistent around 0.2 standard deviation. These positive results are driven by children from the first implementation round, whom had been exposed to the programme for a longer period.

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# Appendix 1: Baseline Balance

Table 16 Baseline Balance

	(TOTAL)	(TREATMENT)	(CONTROL)	<b>(P)</b>
CHILD IS FEMALE	0.48	0.49	0.46	0.053*
	(0.50)	(0.50)	(0.50)	
	[2,887]	[1,647]	[1,240]	
CHILD WAS BORN PREMATURE	0.10	0.10	0.09	0.377
	(0.30)	(0.30)	(0.29)	
	[2,887]	[1,647]	[1,240]	
CORRECT AGE IN MONTHS	27.51	27.46	27.57	0.840
	(11.98)	(11.84)	(12.17)	
	[2,887]	[1,647]	[1,240]	
NUMBER OF HOUSEHOLD MEMBERS (EXCLUDING THE CHILD)	2.38	2.27	2.52	0.556
(Entered find find entered)	(1.65)	(1.64)	(1.66)	
	[2.887]	[1.647]	[1.240]	
PRIMARY CAREGIVER	[_,007]	[1,017]	[1,2.0]	
FATHER	0.06	0.06	0.07	0.209
	(0.24)	(0.23)	(0.26)	0.209
	[2.887]	[1 647]	[1 240]	
MOTHER	0.56	0.57	0.54	0 474
	(0.50)	(0.50)	(0.50)	0.171
	[2.887]	[1.647]	[1.240]	
GRANDFATHER	0.06	0.05	0.07	0.132
	(0.23)	(0.22)	(0.25)	0.102
	[2.887]	[1.647]	[1.240]	
GRANDMOTHER	0.32	0.33	0.31	0.543
	(0.47)	(0.47)	(0.46)	
	[2.887]	[1.647]	[1.240]	
OTHER	0.00	0.00	0.00	0.779
	(0.03)	(0.03)	(0.03)	
	[2.887]	[1.647]	[1.240]	
AGE OF PRIMARY CAREGIVER	39.62	39.61	39.64	0.962
	(13.61)	(13.41)	(13.88)	0.702
	[2,815]	[1.603]	[1,212]	
FATHER LIVED AT HOME FOR LESS THAN 6 MONTHS IN PAST YEAR	0.46	0.44	0.49	0.292
	(0.50)	(0.50)	(0.50)	
	[2,845]	[1,626]	[1,219]	
MOTHER LIVED AT HOME FOR LESS THAN 6 MONTHS IN PAST YEAR	0.21	0.20	0.22	0.565
	(0.41)	(0.40)	(0.41)	
	[2,836]	[1,623]	[1,213]	
YEARS OF EDUCATION OF PRIMARY CAREGIVER	7.40	7.39	7.40	0.961
	(3.06)	(3.00)	(3.14)	
	[2,867]	[1,635]	[1,232]	
YEARS OF EDUCATION OF MOTHER	8.33	8.32	8.33	0.923
	(2.56)	(2.47)	(2.67)	
	[2,764]	[1,583]	[1,181]	
YEARS OF EDUCATION OF FATHER	8.41	8.37	8.47	0.561
	(2.38)	(2.35)	(2.42)	
	[2,826]	[1,614]	[1,212]	
STANDARDIZED ASSET INDEX	0.00	0.04	-0.05	0.309
	(1.00)	(1.01)	(0.98)	
	[2.877]	[1,641]	[1.236]	

NOTE: ALL CHILDREN FROM THE VILLAGES SAMPLED AT ENDLINE FOR WHOM BASELINE DATA ARE AVAILABLE ARE INCLUDED. STANDARD DEVIATIONS BETWEEN PARENTHESES AND SAMPLE SIZE BETWEEN BRACKETS. P-VALUES ARE CORRECTED FOR CLUSTERING.

# Appendix 2: How did parents experience the One Sky project?

This appendix shows the experiences and views of the parents on the parenting centre, the preschools and the community activities. The results for the preschools are presented for One Sky preschools and other preschools separately. Be aware that these are descriptive results, such that differences between these two types of preschools cannot be directly assigned to the project.

	(MEAN)
DO YOU KNOW THAT THERE IS A PARENTING CENTRE IN YOUR VILLAGE?	0.88
	(0.32)
	[1,224]
HAVE YOU EVER BEEN TO THE PARENTING CENTRE IN YOU VILLAGE?	0.73
	(0.44)
	[1,098]
IF YES, HOW MANY TIMES A WEEK?	1.49
	(1.26)
	[787]
HOW LONG DID YOU STAY LAST TIME?	
<10 MIN	0.06
	(0.23)
	[782]
10-30 MIN	0.16
	(0.37)
	[782]
30-60 MIN	0.19
	(0.39)
	[782]
60-120 MIN	0.25
	(0.44)
	[782]
>120 MIN	0.34
	(0.47)
	[782]
MAIN ACTIVITIES	
PLAY TOYS WITH CHILD	0.94
	(0.24)
	[789]
SING AND DANCE WITH CHILD	0.58
	(0.49)
	[789]
ATTEND LECTURES	0.57
	(0.49)
	[789]
TALK WITH OTHER PARENTS ABOUT CHILDREN	0.38
	(0.49)
	[789]
NONE OF ABOVE	0.02
	(0.14)
	[789]
WHEN IS THE LAST TIME THAT YOU TOOK YOUR CHILD TO THE PARENTING CENTRE?	
YESTERDAY	0.05
	(0.21)
	[781]
2-3 DAYS AGO	0.17
	(0.38)
	[781]

#### *Table 17 Experience at the parenting centre*

ONE WEEK AGO	0.25
	(0.43)
	[781]
ONE MONTH AGO	0.24
	(0.43)
	[781]
SEVERAL MONTHS AGO	0.29
	(0.46)
	[781]
HOW MANY TIMES DID YOU PARTICIPATED IN THE PARENTING LECTURE IN THE	2.13
LAST MONTH?	2.15
	(3.68)
	[779]
HOW USEFUL DO YOU FIND THE LECTURE?	
NEVER LISTENED TO LECTURE	0.15
	(0.35)
	[791]
TOTALLY USELESS	0.01
	(0.09)
	[791]
ALMOST USELESS	0.04
	(0.19)
	[791]
A LITTLE BIT HELPFUL	0.53
	(0.50)
	[791]
VERY HELPFUL	0.27
	(0.45)
	[791]
HOW OFTEN DOES THE TRAINER DO A HOME VISIT?	[/)1]
NEVER	0.13
	(0.13)
	[778]
AT MOST NEVER	0.20
	(0.20)
	[778]
LESS THAN ONCE A MONTH	0.28
	(0.20)
	[778]
ONCE A MONTH	0.20
	(0.20)
	[778]
2-3 TIMES A MONTH	0.06
	(0.23)
	[778]
ONCE A WEEK	0.14
	(0.35)
	[778]
DO YOU USE WHAT YOU LEARN FROM LECTURES WHEN YOU TAKE CARE OF	0.78
YOUR BABY?	0.70
	(0.42)
	[784]
HOW OFTEN DO YOU TALK TO OTHERS ABOUT THE CENTRE?	
OFTEN	0.21
	(0.41)
	[787]
SOMETIMES	0.47
	(0.50)
	[787]
ALMOST NEVER	0.21
	(0.41)

	[787]
NEVER	0.11
	(0.32)
	[787]
IN WHAT WAY IS THE PARENTING CENTRE HELPFUL?	
A PLACE FOR CHILDREN TO PLAY	0.46
	(0.50)
	[783]
PARENTS CAN COMMUNICATE WITH EACH OTHER	0.19
	(0.39)
	[783]
LEARN HOW TO COMMUNICATE WITH THE CHILD	0.44
	(0.50)
	[783]
NOTE: STANDARD DEVIATIONS BETWEEN PARENTHESES AND NUMBER OF OBSERVATIO BRACKETS.	NS BETWEEN

	OTHER PRESCHOOLS	ONE SKY PRESCHOOL
DAYS PER WEEK IN PRESCHOOL	5.00	5.02
	(0.22)	(0.22)
	[1,038]	[433]
HOURS PER DAY IN PRESCHOOL	8.45	7.86
	(1.31)	(1.31)
	[1,037]	[433]
SCHOOL FEE PER MONTH	281.05	207.94
	(144.12)	(111.27)
	[462]	[427]
DOES THE PRESCHOOL PROVIDE LUNCH?	0.92	0.84
	(0.27)	(0.37)
	[1,031]	[432]
DOES THE PRESCHOOL PROVIDE INFORMATION ON THE DEVELOPMENT OF YOUR CHILD?	0.82	0.89
	(0.38)	(0.31)
	[1,035]	[433]
IF YES, HOW MANY TIMES IN THE LAST SEMESTER?	2.85	2.97
	(1.07)	(0.98)
	[842]	[380]
DOES THE TEACHER INVITE YOU INTO THE CLASSROOM TO GET FURTHER UNDERSTANDING OF THEIR TEACHING METHODS?	0.44	0.63
	(0.50)	(0.48)
	[1,035]	[432]
IF YES, HOW MANY TIMES IN THE LAST SEMESTER?	2.38	2.54
	(1.02)	(0.95)
	[482]	[291]
DOES THIS KINDERGARTEN PUT THE CHILDREN'S CREATIONS ON THE WALL?	0.70	0.86
	(0.46)	(0.35)
	[1,033]	[430]
HAVE YOU BEEN INVITED INTO THE CLASSROOM WECHAT GROUP?	0.63	0.72
	(0.48)	(0.45)
	[1,031]	[428]
WHAT KIND OF INFORMATION DO YOU GET IN THE WECHAT GROUP?		

#### Table 18 Experience with preschools

JUST SOME NOTICE	0.84	0.86
	(0.37)	(0.35)
	[651]	[311]
PHOTOS AND VIDEOS OF CHILRDEN IN THE	0.85	0.89
CLASSROOM	0.05	0.89
	(0.35)	(0.31)
	[651]	[311]
HOW AND WHY THE TEACHERS TEACH	0.40	0.48
CERTAIN LESSONS	0.10	0.40
	(0.49)	(0.50)
	[651]	[311]
HOW MANY TIMES DID YOU GET	0.51	2.21
INFORMATION IN THE WECHAT GROUP IN		2.21
THE LAST SEMESTER?		
	(2.19)	(3.43)
	[643]	[309]
HOW COULD THE PRESCHOOL BE		
IMPROVED?		
PROVIDE MEAL AT NOON	0.04	0.08
	(0.19)	(0.27)
	[999]	[401]
PROVIDE BED FOR REST	0.07	0.10
	(0.26)	(0.30)
	[999]	[401]
WORK ON WEEKEND	0.02	0.02
	(0.15)	(0.13)
	[999]	[401]
OTHER REASON	0.89	0.85
	(0.31)	(0.35)
	[999]	[401]
ARE YOU WILLING TO PAY FOR LUNCH?	[]	1 1
YES	0.75	0.77
	(0.43)	(0.42)
	[1.028]	[431]
NO	0.08	0.08
	(0.27)	(0.27)
	[1 028]	[431]
DEPENDS	0.08	0.07
	(0.28)	(0.26)
	[1 028]	[431]
OTHER	0.09	0.07
	(0.28)	(0.26)
	[1 028]	[431]
DOES THE PRESCHOOL TEACH PRIMARY	[1,020]	
SCHOOL LEVEL CONTENT?		
YES	0.42	0.37
	(0.49)	(0.48)
	[1.035]	[432]
NO	0.33	0.40
	(0.47)	(0.49)
	[1.035]	[432]
NOT CLEAR	0.26	0.22
	(0.44)	(0.42)
	[1.035]	[432]
DOES THE KINDERGARTEN ARRANGE	0.82	0.89
OUTDOOR ACTIVITIES EVERY DAY?		0.07
	(0.39)	(0.31)
	[1,012]	[427]
HOW LONG DO THE OUTDOOR ACTIVITIES		
LAST?		
>1 HOUR	0.27	0.28
	(0.44)	(0.45)

	[788]	[368]			
HALF AN HOUR	0.38	0.43			
	(0.49)	(0.50)			
	[788]	[368]			
NOT REGULAR	0.35	0.29			
	(0.48)	(0.46)			
	[788]	[368]			
HAS YOUR CHILD BEEN PUNISHED BY	0.29	0.22			
TEACHERS?					
	(0.45)	(0.42)			
	[762]	[339]			
IS THIS PRESCHOOL DIFFERENT	0.04	0.04			
COMPARED TO OTHERS?					
	(0.20)	(0.19)			
	[1,029]	[432]			
NOTE: STANDARD DEVIATIONS BETWEEN PARI BRACKETS OTHER PRESCHOOLS ARE LOCATE	NOTE: STANDARD DEVIATIONS BETWEEN PARENTHESES AND NUMBER OF OBSERVATIONS BETWEEN BRACKETS, OTHER PRESCHOOLS, ARE LOCATED IN TREATMENT AND CONTROL VILLAGES				

Table	19	Experience	with	community	activities

	(MEAN)
HAVE YOU TAKEN PART IN COMMUNITY ACTIVITIES?	0.49
	(0.50)
	[1,354]
HOW OFTEN DO YOU PARTICIPATE IN COMMUNITY ACTIVITIES?	
EVERY DAY	0.20
	(0.40)
	[656]
ONCE A WEEK	0.10
	(0.31)
	[656]
MORE THAN TWICE A MONTH	0.12
	(0.32)
	[656]
OTHER	0.58
	(0.49)
	[656]
WHICH COMMUNITY ACTIVITIES DO YOU KNOW?	
WECHAT GROUP	0.32
	(0.47)
	[656]
INTEREST GROUP	0.07
	(0.25)
	[656]
PARENTING CENTER	0.73
	(0.45)
	[656]
COMMUNITY MEETING	0.12
	(0.32)
	[656]
VILLAGE SQUARE	0.55
	(0.50)
	[656]
OTHER	0.03
	(0.17)
	[656]
DO YOU THINK COMMUNITY ACTIVITIES IS HELPFUL FOR YOU AND YOUR CHILD?	0.94
	(0.24)
	[649]
HOW ARE THE ACTIVITIES HELPFUL?	

ENRICH MY LIFE	0.60
	(0.49)
	[643]
PROVIDE AN OPPORTUNITY FOR PARENT-CHILD INTERACTION	0.60
	(0.49)
	[643]
PROVIDE AN OPPORTUNITY FOR INTERACTION BETWEEN VILLAGERS	0.44
	(0.50)
	[643]
PROVIDE A SAFE PLAYGROUND FOR CHILDREN	0.61
	(0.49)
	[643]
NOTE: STANDARD DEVIATIONS BETWEEN PARENTHESES AND NUMBER OF OBSERVATIO BRACKETS.	NS BETWEEN

# Appendix 3. Non-standardized descriptive values of control group at end line

	RANGE	(MEAN)	(SD)	(N)
PARENTING STYLES				
WARMTH	0-1	0.70	0.08	988
CONSISTENCY	0-1	0.63	0.09	988
HOSTILE PARENTING	0-1	0.60	0.11	988
HOSTILITY ( $\geq 2$ YEARS)	0-1	0.62	0.09	911
TOTAL	0-1	0.64	0.06	988
HOME (<3 YEARS OLD)				
EMOTIONAL SUPPORT	0-10	7.90	2.59	287
ACCEPTATION	0-7	5.30	1.39	275
ENVIRONMENT EXPOSURE	0-9	6.26	1.53	266
LEARNING MATERIALS AND TOYS	0-8	5.39	1.37	269
PARENT INVOLVEMENT	0-6	5.16	1.03	268
INTERACTION WITH FAMILY	0-6	2.63	1.30	275
PRESCHOOL SCORES (ENROLLED CHI	LDREN)			
INFORMATION ON DEVELOPMENT OF	0-1	0.83	0.38	600
THE CHILD				
BUILDING	0-10	7.85	1.59	596
TOYS AND BOOKS	0-10	7.73	1.72	589
TEACHER	0-10	8.30	1.63	594
ASQ-3				
COMMUNICATION	0-1	0.87	0.19	921
GROSS-MOTOR	0-1	0.91	0.16	921
FINE-MOTOR	0-1	0.74	0.24	916
PROBLEM-SOLVING	0-1	0.80	0.20	919
PERSONAL-SOCIAL	0-1	0.84	0.18	921
TOTAL	0-1	0.83	0.14	921
ASQ-SE (THE LOWER THE BETTER)	0-1	0.13	0.10	892
EHCI (>= 3 YEARS OLD)				
VERBAL	0-1	0.93	0.15	669
APPROACH TO LEARNING	0-1	0.93	0.14	669
CULTURAL KNOWLEDGE	0-1	0.91	0.17	668
SOCIO-EMOTIONAL	0-1	0.78	0.19	669
PERSEVERANCE	0-1	0.61	0.28	667
PHYSICAL	0-1	0.83	0.22	669
NUMERACY	0-1	0.70	0.26	669
READING	0-1	0.59	0.26	666
WRITING	0-1	0.41	0.35	669
OVERALL READINESS TO LEARN	0-1	0.63	0.24	669
OVERALL DEVELOPMENT	0-1	0.74	0.14	669
NOTE: Overall development includes numeroave rea	ding and ur	ting		

#### Table 20 Non-standardized control outcome values at end line

NOTE: Overall development includes numeracy, reading and writing.

# Appendix 4: Results by implementation round

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
		Warmth	I	(	Consistency			Hostile Parenting		
	ITT	LATE	LATE	ITT	LATE	LATE	ITT	LATE	LATE	
		1st round	l2 <sup>nd</sup> round		1st round	2 <sup>nd</sup> round		1st round	2 <sup>nd</sup> round	
TREATMENT EFFECT X SECOND ROUND	-0.131		0.191**	-0.199		-0.026	-0.073		-0.050	
	(0.098)		(0.078)	(0.123)		(0.081)	(0.144)		(0.098)	
	Ì		. ,			, í			. ,	
TREATMENT EFFECT	0.285***	0.376***		0.183*	0.239**		0.034	0.050		
	(0.074)	(0.097)		(0.102)	(0.111)		(0.120)	(0.147)		
SECOND ROUND	0.012			0.074			0.183*			
	(0.084)			(0.086)			(0.109)			
LAGGED DEPENDENT VARIABLE	0.050	-0.213	0.104	-0.345	0.188	-0.421*	-0.258	-0.197	-0.068	
	(0.189)	(0.148)	(0.195)	(0.228)	(0.157)	(0.230)	(0.245)	(0.162)	(0.259)	
CONSTANT	0.087***	0.100**	0.076***	0.081***	0.070**	0.081***	0.056***	0.058***	0.058**	
	(0.024)	(0.041)	(0.028)	(0.019)	(0.031)	(0.021)	(0.019)	(0.021)	(0.028)	
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
OBSERVATIONS	2129	880	1249	2129	880	1249	2129	880	1249	

Table 21 Parenting styles by implementation round

	(1)	(2)	(3)	(4)	(5)	(6)
		Hostility			Total	
	ITT	LATE	LATE	ITT	LATE	LATE
		1st round	2 <sup>nd</sup> round		1st round	2 <sup>nd</sup> round
TREATMENT EFFECT X SECOND ROUND	-0.298**		-0.017	-0.215		0.046
	(0.148)		(0.091)	(0.136)		(0.091)
				. ,		. ,
TREATMENT EFFECT	0.295**	0.402***		0.254**	0.339***	
	(0.125)	(0.154)		(0.114)	(0.127)	
SECOND ROUND	0.151			0.157*		
	(0.114)			(0.093)		
LAGGED DEPENDENT VARIABLE	0.093***	0.041	0.121***	0.101***	0.096**	0.106***
	(0.034)	(0.060)	(0.037)	(0.021)	(0.037)	(0.022)
CONSTANT	-0.960***	0.479*	0.298	-0.316	-0.097	-0.222
	(0.178)	(0.246)	(0.203)	(0.234)	(0.168)	(0.235)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes
OBSERVATIONS	1190	484	706	2129	880	1249

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky

Note: Hostility was only relevant to caregivers of children that are 2 years old or above, and is excluded from the total score. Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, and the ASQ age group. \* p < .10, \*\* p < .05, \*\*\* p < .01

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Cor	nmunica	tion	Gross-motor			Fine-motor		
	ITT	LATE	LATE	ITT	LATE	LATE	ITT	LATE	LATE
		1st round	2 <sup>nd</sup> round		1st round	2 <sup>nd</sup> round		1st round	2 <sup>nd</sup> round
TREATMENT EFFECT X									
SECOND ROUND	-0.069		0.031	0.067		0.198*	-0.033		0.127
	(0.122)		(0.100)	(0.118)		(0.115)	(0.141)		(0.109)
TREATMENT EFFECT	0.101	0.127		0.092	0.130		0.131	0.166	
	(0.093)	(0.119)		(0.065)	(0.083)		(0.108)	(0.133)	
					( ) 				
SECOND ROUND	-0.047			-0.192*			-0.017		
	(0.090)			(0.103)			(0.090)		
	(0.050)			(0.105)			(0.090)		
LAGGED DEPENDENT VARIABLE	0.1(5***	0 000**	0 00 4***	0 1 4 5 * * *	0 000***	0 17(***	0 150***	0 174***	0 122***
	0.165***	0.080**	0.224***	0.145***	0.099***	0.1/6***	0.152***	0.1/4***	0.132***
	(0.033)	(0.033)	(0.044)	(0.027)	(0.038)	(0.035)	(0.025)	(0.041)	(0.030)
CONSTANT	-1.355***	-0.433***	-1.314***	-0.139	0.126	-0.292	-0.329	-0.133	-0.313
	(0.235)	(0.160)	(0.264)	(0.277)	(0.111)	(0.274)	(0.228)	(0.134)	(0.239)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OBSERVATIONS	2123	876	1247	2126	879	1247	2106	860	1246
	2123	0/0	124/	2120	0/7	124/	2100	000	1240

# Table 22 ASQ-3 by implementation round

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Pr	oblem-solvi	ng	Р	ersonal-soc	ial			
	ITT	LATE	LATE	ITT	LATE	LATE	ITT	LATE	LATE
		1st round	2 <sup>nd</sup> round		1st round	2 <sup>nd</sup> round		1st round	2 <sup>nd</sup> round
TREATMENT EFFECT X SECOND ROUND	0.003		0.131	0.028		0.206**	-0.023		0.180
	(0.136)		(0.115)	(0.115)		(0.091)	(0.140)		(0.116)
TREATMENT EFFECT	0.108	0.150		0.144	0.202*		0.172*	0.232*	
	(0.099)	(0.123)		(0.088)	(0.113)		(0.102)	(0.129)	
SECOND ROUND	-0.136			-0.169*			-0.159		
	(0.105)			(0.095)			(0.108)		
LAGGED DEPENDENT VARIABLE	0.110***	0.064	0.148***	0.148***	0.112***	0.177***	0.287***	0.228***	0.321***
	(0.028)	(0.043)	(0.035)	(0.026)	(0.026)	(0.040)	(0.038)	(0.053)	(0.049)
CONSTANT	-0.683***	-0.059	-0.800***	-0.363*	0.458***	-0.627***	-0.671***	0.030	-0.806***
	(0.220)	(0.174)	(0.224)	(0.197)	(0.111)	(0.226)	(0.244)	(0.152)	(0.258)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OBSERVATIONS	2118	872	1246	2126	879	1247	2126	879	1247

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky

Note: Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, and the ASQ age group. \* p < .05, \*\*\* p < .05, \*\*\* p < .01

(1)	(2)	(3)
	Socio-emotional	
ITT	LATE	LATE
	1st round	2 <sup>nd</sup> round
0.160*		-0.010
(0.081)		(0.055)
-0.165**	-0.201**	
(0.068)	(0.086)	
-0.098		
(0.065)		
0.154***	0.046	0.224***
(0.037)	(0.051)	(0.042)
-0.046	0.835***	-0.091
(0.106)	(0.146)	(0.095)
Yes	Yes	Yes
2098	880	1218
	(1) <i>ITT</i> 0.160* (0.081) -0.165** (0.068) -0.098 (0.065) 0.154*** (0.037) -0.046 (0.106) Yes 2098	(1) (2)   Socio-emotional   ITT LATE   Ist round   0.160*   (0.081)   -0.165**   -0.165**   -0.098   (0.065)   0.154***   0.046   (0.037)   -0.046   0.835***   (0.106)   Yes   Yes   2098

#### Table 23 ASQ-SE by implementation round

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky Note: Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, and the ASQ age group. \* p < .10, \*\* p < .05, \*\*\* p < .01

#### Appendix 5: Results for the parenting component

	(1)	(2)	(3)	(4)	(5)	(6)
	W	armth	Cor	isistency	Hostil	e Parenting
	ITT	LATE	ITT	LATE	ITT	LATE
TREATMENT EFFECT	0.194***	0.243***	0.032	0.040	0.022	0.027
	(0.070)	(0.086)	(0.078)	(0.095)	(0.089)	(0.109)
		( )		( )		
LAGGED DEPENDENT						
VARIABLE	0.101**	0.103***	0.106***	0.105***	0.027	0.027
	(0.038)	(0.037)	(0.029)	(0.028)	(0.036)	(0.035)
CONSTANT	-0.307	-0.268	-0.496	-0.490*	-0.213	-0.209
	(0.257)	(0.255)	(0.300)	(0.286)	(0.378)	(0.367)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes
OBSERVATIONS	668	668	668	668	668	668
			,	Total		
			ITT	LATE		
TREATMENT EFFECT			0.125	0.157		
			(0.082)	(0.099)		
				<b>`</b>		
LAGGED DEPENDENT			0.000##	0.000		
VARIABLE			0.090**	0.088**		
			(0.036)	(0.035)		
CONSTANT						
CONSTANT			-0.555**	-0.530**		
			(0.268)	(0.255)		
CONTROLS			Yes	Yes		
OBSERVATIONS			668	668		

Table 24 Parenting styles - under three years old

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky Note: Hostility was only relevant to caregivers of children that are 2 years old or above, so children under three at end line do not have a baseline value. Therefore, the component is excluded from the table. Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, and the ASQ age group. \* p < .10, \*\* p < .05, \*\*\* p < .01

	(1)	(2)	(3)	(4)	(5)	(6)	
	Comn	nunication	Gros	s-motor	<b>Fine-motor</b>		
	ITT	LATE	ITT	LATE	ITT	LATE	
TREATMENT EFFECT	0.103	0.129	0.223*	0.279*	0.089	0.112	
	(0.095)	(0.116)	(0.123)	(0.150)	(0.101)	(0.123)	
LAGGED DEPENDENT VARIABLE	0.229***	0.227***	0.129***	0.129***	0.119**	0.117**	
	(0.043)	(0.042)	(0.043)	(0.043)	(0.047)	(0.046)	
CONSTANT	-1.121***	-1.103***	-0.139	-0.095	-0.272	-0.254	
	(0.269)	(0.259)	(0.316)	(0.302)	(0.307)	(0.298)	
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes	
ORGERNATIONS							
OBSERVATIONS	666	666	666	666	664	664	
	D		D	1		P - 4 - 1	
	Proble	em-solving	Person	1al-social		otal	
		LAIE	111	LAIE	111	LAIE	
IREAIMENT EFFECT	0.138	0.173	0.069	0.086	0.161	0.201	
	(0.100)	(0.121)	(0.100)	(0.123)	(0.104)	(0.126)	
I ACCED DEDENDENT VADIADI E							
LAGGED DEFENDENT VARIABLE	0.079**	0.078**	0.192***	0.191***	0.304***	0.301***	
	(0.038)	(0.037)	(0.048)	(0.047)	(0.048)	(0.047)	
CONSTANT							
CONSTANT	-0.928***	-0.900***	-0.554*	-0.540*	-0.724**	-0.694***	
	(0.255)	(0.244)	(0.301)	(0.286)	(0.279)	(0.266)	
CONTROLS		**	**			**	
	Yes	Yes	Yes	Yes	Yes	Yes	
OBSERVATIONS	665	665	666	666	666	666	

#### Table 25 ASQ 3 - under three years old

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky Note: Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, and the ASQ age group. \* p < .10, \*\* p < .05, \*\*\* p < .01

	(1)	(2)
	ASQ Soc	io-Emotional
	ITT	LATE
TREATMENT EFFECT	0.051	0.063
	(0.056)	(0.069)
LAGGED DEPENDENT VARIABLE	0.168***	0.170***
	(0.045)	(0.043)
CONSTANT	-0.219*	-0.208*
	(0.129)	(0.126)
CONTROLS	Yes	Yes
OBSERVATIONS	637	637
Source heading 2015 heading 2016 and and line 2017		On a Class

#### Table 26 ASQ-SE – under three years old

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky Note: Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, and the ASQ age group. \* p < .10, \*\* p < .05, \*\*\* p < .01

# Appendix 6: Results for the preschool component

	(1)	(2)	(3)	(4)	(5)	(6)	
	Comr	nunication	Gros	ss-motor	Fine-motor		
	ITT	LATE	ITT	LATE	ITT	LATE	
TREATMENT EFFECT	-0.014	-0.027	0.013	0.026	0.090	0.179	
	(0.080)	(0.156)	(0.063)	(0.125)	(0.075)	(0.142)	
LAGGED DEPENDENT VARIABLE	0.089*	0.090*	0.127***	0.127***	0.133***	0.131***	
	(0.050)	(0.047)	(0.040)	(0.039)	(0.032)	(0.033)	
CONSTANT	-0.342*	-0.486***	-0.251	-0.120	-0.482*	-0.084	
	(0.180)	(0.155)	(0.181)	(0.134)	(0.246)	(0.148)	
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes	
OBSERVATIONS	846	846	849	849	833	833	
			_				
	Probl	em-solving	Perso	nal-social	1	otal	
		LATE	IIT	LATE	ITT	LATE	
TREATMENT EFFECT	0.075	0.149	0.142**	0.287**	0.096	0.191	
	(0.063)	(0.124)	(0.061)	(0.131)	(0.077)	(0.153)	
LAGGED DEPENDEN I VARIABLE	0.118***	0.116***	0.087**	0.075**	0.231***	0.224***	
	(0.039)	(0.038)	(0.034)	(0.033)	(0.049)	(0.050)	
CONSTANT	0.508***	-0.139	-0.352**	0.428***	-0.537***	-0.050	
	(0.147)	(0.148)	(0.165)	(0.110)	(0.183)	(0.144)	
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes	
OBSERVATIONS	843	843	849	849	849	849	

#### Table 27 ASQ 3 - above four years old

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky

Note: Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, and the ASQ age group. \* p < .10, \*\* p < .05, \*\*\* p < .01\* p < .01

	(1)	(2)
	ASQ Soci	io-Emotional
	ITT	LATE
TREATMENT EFFECT	-0.178***	-0.356***
	(0.066)	(0.138)
LAGGED DEPENDENT VARIABLE	0.139*	0.130*
	(0.073)	(0.074)
CONSTANT	0.199	1.043***
	(0.122)	(0.104)
CONTROLS	Yes	Yes
OBSERVATIONS	849	849
Source: baseline 2015, baseline 2016 and end l	ine 2017 caregive	er survey, One Sky

#### Table 28 ASQ-SE - above four years old

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky Note: Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, and the ASQ age group. \* p < .10, \*\* p < .05, \*\*\* p < .01

	(1)	(2)	(3)	(4)	(5)	(6)
	Verbal		Approach to learning		Cultural knowledge	
	ITT	LATE	ITT	LATE	ITT	LATE
TREATMENT EFFECT	0.076	0.134	0.171	0.301	0.203**	0.357**
	(0.101)	(0.175)	(0.111)	(0.197)	(0.083)	(0.150)
LAGGED DEPENDENT VARIABLE	0.059	0.056	0.077	0.075	0.045	0.046
	(0.058)	(0.057)	(0.052)	(0.051)	(0.033)	(0.033)
CONSTANT	-0.144	0.032	-0.278*	-0.081	-0.236	-0.001
	(0.178)	(0.162)	(0.161)	(0.159)	(0.200)	(0.161)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes
OBSERVATIONS	502	502	502	502	501	501
	Socio-emotional		Perseverance		Physical	
	ITT	LATE	ITT	LATE	ITT	LATE
TREATMENT EFFECT	0.107	0.188	0.005	0.010	0.180**	0.316**
	(0.082)	(0.143)	(0.074)	(0.127)	(0.087)	(0.154)
LAGGED DEPENDENT VARIABLE	0.139***	0.137***	0.075*	0.075*	0.118**	0.111**
	(0.045)	(0.044)	(0.041)	(0.041)	(0.047)	(0.046)

Table 29 eHCI domains – above four yours old

CONSTANT	-0.111	0.174	-0.251	0.048	0.071	0.190
	(0.197)	(0.180)	(0.160)	(0.146)	(0.259)	(0.208)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes
OBSERVATIONS	502	502	500	500	502	502
	Overall Development					
			ITT	LATE		
TREATMENT EFFECT			0.163**	0.286**		
			(0.070)	(0.123)		
LAGGED DEPENDENT VARIABLE			0.165***	0.156***		
			(0.045)	(0.046)		
CONSTANT			0.101	0.486***		
			(0.154)	(0.140)		
CONTROLS			Yes	Yes		
OBSERVATIONS			502	502		

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky Note: Overall development includes numeracy, reading and writing. Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, and the ASQ age group. \* p < .10, \*\* p < .05, \*\*\* p < .01

#### Table 30 eHCI readiness to learn - above four years old

	(1)	(2)	(3)	(4)	(5)	(6)
	Numeracy		Reading		Writing	
	ITT	LATE	ITT	LATE	ITT	LATE
TREATMENT EFFECT	0.037	0.064	0.023	0.041	0.159*	0.281**
	(0.059)	(0.102)	(0.062)	(0.108)	(0.080)	(0.138)
CONSTANT	0.111***	0.111***	0.140***	0.138***	0.142***	0.131***
	(0.032)	(0.032)	(0.038)	(0.037)	(0.043)	(0.043)
LAGGED DEPENDENT VARIABLE	-0.032	0.397***	-0.395**	0.345**	0.382**	0.715***
	(0.136)	(0.116)	(0.191)	(0.155)	(0.165)	(0.158)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes
OBSERVATIONS	502	502	501	501	502	502

	Overall numeracy and literacy			
		ITT	LATE	
TREATMENT EFFECT		0.058	0.102	
		(0.061)	(0.105)	
LAGGED DEPENDENT VARIABLE		0.168***	0.165***	
		(0.036)	(0.036)	
CONSTANT		0.173	0.555***	
		(0.130)	(0.116)	
CONTROLS		Yes	Yes	
OBSERVATIONS		502	502	

Source: baseline 2015, baseline 2016 and end line 2017 caregiver survey, One Sky Note: Standard errors between parentheses and corrected for clustering. Controlled for gender, assets, the mother's education years, the number of months that the mother and father were home, and the ASQ age group. \* p < .10, \*\* p < .05, \*\*\* p < .01